Leucadendron R. Br. 1810

The type species for the genus *Protea* is the Silver Tree which Linnaeus named *Protea argentea* in 1753. Linnaeus in fact split the Protea Family into two, unaccountably placing the Silvertree in *Protea* and the King Protea into *Leucadendron*, an error (never acknowledged as such) which he later solved by sinking all the species into the genus *Protea*. *Leucadendron* as understood today, was first used in 1766 by Bergius.

Richard Salisbury in his 1807 work, followed the same formula as he did for the rest of the family – namely that the genera should be determined by fruit and flower morphology – and recognized 7 groups in 4 genera, including:

- *Chasme* (all the Needle-leaf Conebushes),
- *Euryspermum* (with flat seeds in 3 groups: 1: all the Clay and Sunshine Conebushes; 2: all the Delta-seed Conebushes; and 3: all the Crown Conebushes),
- *Gissonia* (with pointed base seeds: the Ridgeseed, Pauciflor and some of the Silver Conebushes), and
- *Protea* (with round nuts in 2 groups: 1: the Silvertree - following on Linnaeus's original concept, and Arid, and Oilbract, and Sun Conebushes; and, 2: all the Fusebract and Sandveld Conebushes).

Robert Brown in 1810 upheld the genus *Leucadendron* which is now conserved. He recognized four sections (given names of sub-generic status by Endl. in 1847) determined by fruit and flower morphology:

- *Argyrodendron* (Silver, Arid and Sun Conebushes),
- *Levisanus* (Pauciflor, Fusebract and Sandveld Conebushes),
- *Euryspermum* (Sunshine, Delta-seed, Clay and Crown Conebushes), and
- *Strobilanthus* (Needle-leaf Conebushes).

Thus with *Chasme* = *Strobilanthus, Euryspermum* = *Euryspermum, Gissonia* (not worked by Brown) and *Protea** = *Levisanus* and *Protea*** = *Argyrodendron* .
There are 14 groups (with sub-section status) within the genus, in two sections.

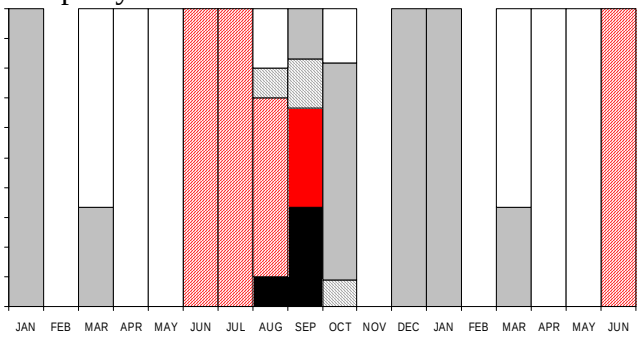
There are five leaf forms in many species. Juvenile (pre reproductive) leaves are usually more twisted, narrower and often hairier than adult leaves, being entirely needle-like in the Needle-leaf Conebushes. These leaves are often similar within the sections and it is often not possible to identify species within sections from seedlings. In species with corymbose growth habit (*L. ericifolium,* Fuse-bract, Delta-seed Conebushes and *L. diemontianum* and *discolor* among the Sunshine Conebushes, and *L. muirii* and *immoderatum* among the Needle-leaf Conebushes) the basal dense branches retain juvenile leaves and only the erect reproductive stems bear adult ("stem") leaves. Stem leaves, which are often much smaller in males, usually appear just before reproduction and last throughout the life of the plant, although resprouters often revert to juvenile foliage in the year or two following a fire. Below the flowerheads are the involucral leaves, these are usually smaller in male plants: these turn bright yellow, ivory, pink or red during flowering in many species.
Identifying Conebushes is further complicated by seasonal differences in leaves. Thus during flowering the plants are often brightly coloured and extremely conspicuous. After flowering the new growth has hairy, often red or silver, leaves, which renders the bushes noticeable. When the leaves mature they turn dull green and are often hairless, so that the bushes are relatively inconspicuous. These three faces are often confusing to beginners wrestling with the identification of species in the genus.

Leucadendron coriaceum Phill. & Hutch. 1912
Rosette Conebush

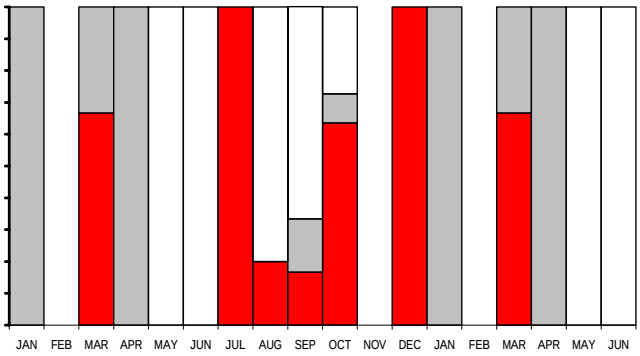
Other Common Names: None known.
Other Scientific Names: *angustatum* var. *latifolium* Meisn. 1856.

37 Records

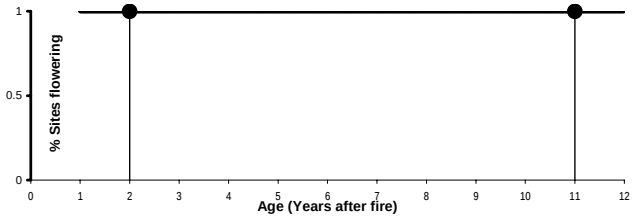
Population (37 records): 32% Common, 59% Frequent, 8% Rare.
Dispersion (36 records): 47% variable, 47% clumped, 3% evenly distributed, 3% widespread.
Flowering (37 records with: Jan 1, Feb 0, Mar 3, Apr 1, May 1, Jun 1, Jul 2, Aug 10, Sep 6, Oct 11, Nov 0, Dec 1): Buds from Jun to Aug; Flowering from Sep; Peak Flowering from Sep; Over not significant; Fruit from Oct to Mar; Nothing from Mar to May. Peak levels unreliable at 83% in Sep. Historically recorded as flowering from Sep, with fruit ripe by December and shed.



Growth (37 records with: Jan 1, Feb 0, Mar 3, Apr 1, May 1, Jun 1, Jul 2, Aug 10, Sep 6, Oct 11, Nov 0, Dec 1): Much from Mar and Jul to Aug and Oct to Dec; Rare from Jan to Apr; None from May to Oct. Peak levels unreliable at 73% in Oct.

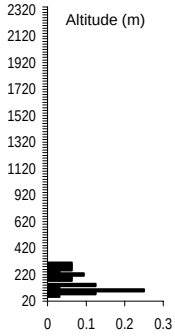


Seedlings (21 records): Absent in 81%: fewer seedlings than prefire adults in 2 cases. Seedlings found in Jul (2).
Fire Survival (6 records): 83% resprouted from underground boles, 17% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 2 years, and 100% recorded at 2 years.

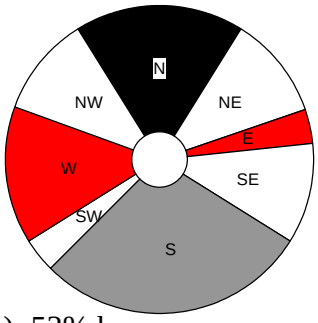


Height (37 records): 3% 0-0.2 m tall, 92% 0.2-1 m tall, 5% 1-2 m tall.
Pollinators (4 records): 75% beetles, 25% flies.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (32 records): 100% inland - further than 2 km from coast.
Altitude (32 records): 40 - 300 m; 80 $_{lq}$ - 100 $_{med}$ - 100 $_{uq}$m.



Landform (32 records): 78% deep soil, 16% shallow soil, 6% rocky outcrops.
Slope (32 records): 66% gentle incline, 19% steep incline, 6% hill top, 6% platform, 3% valley bottom.
Aspect (28 records): 38% South, 29% North, 21% West, 13% East.



Soil Type (31 records): 42% loamy, 29% gravelly, 19% clayey, 10% sandy.
Soil Colour (32 records): 53% brown, 34% grey, 6% other, 3% white, 3% orange.
Geology (31 records): 55% silcrete or ferricrete, 29% shale, 16% sandstone.
Vegetation (32 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Endangered A2c, B1a(i)b(i,ii,iii,iv,v) + 2a(i)b(i,ii,iii,iv,v).
Occurrence (Total and Fynbos): 2 222 and 241 km^2 with 4,35% conserved and 80,13% lost; Occupancy: 45 km^2 with 2% conserved and 51% lost. Fragmentation index: 2%.
Nature Reserves (32 records): 0% in Nature Reserves - unconserved.
Habitat destruction (32 records): 59% extensive natural habitat, 25% islands, 9% naturally fragmented habitats, 6% naturally linear habitats.
Alien Invasive Species (32 records): 47% Fabaceae (chiefly alien *Acacia*), 34% none, 16% *Pinus*, 3% *Hakea*.
Alien Density (32 records): 34% alien-free, 53% sparse, 13% abundant.

Cultivation & Utilization:

Picking (31 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Cattle grazing area but no new shoots yet (CBE93031801);
All males (AGRY0090810);
Some 20 plants (CVWY5071001); 30 plants (CVWY5071002); Another smaller population (still code F) 0 4km NNW of this one on a N-facing slope (EGHY0090701); Some 32 plants (IEBY4091301); About 30 plants - this appears to be an unatlassed population previously known from old herbarium records (NAH96091303);

Confusing Species: No similar species noted.
Records of identification queries = 2.

Variation and Taxonomy: No variation noted.

Distribution: Add.
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Leucadendron brunioides var. *brunioides* Meisn. 1856

Foetid Conebush

Tolletjies

Other Common Names: Tortum, *Duineknoppiesbos, Geeltolbos, Kraaltolbos, Langbeentjie.*

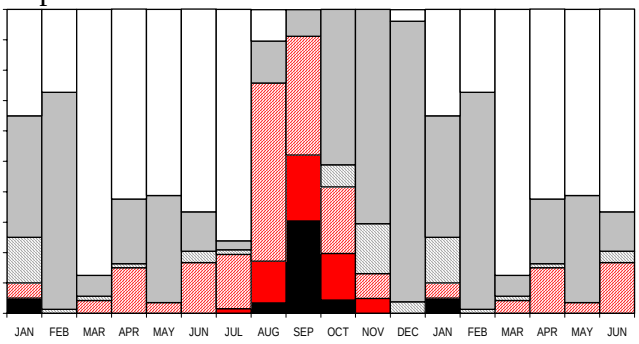
Other Scientific Names: *canaliculatum* E.Mey. 1844, *fusciflora* Phill. & Hutch. 1912, *imbricatum* E.Mey. 1844, *inflexum* Link 1821, *lineare* (Houtt.) 1775, *tenuifolium* (Thunb.) 1803, *thunbergii* (Steud.) 1840, *torta* (Thunb.) 1781, *tortum* var. *inflexum* Meisn. 1856.

743 Records

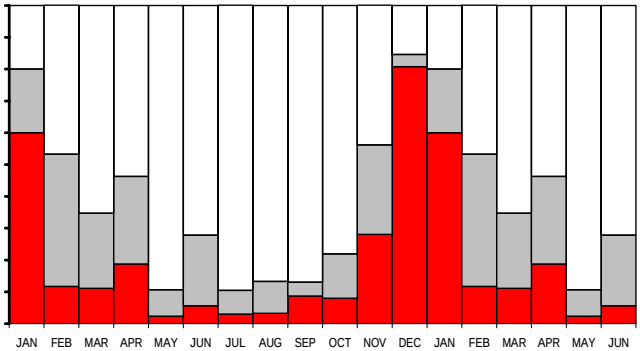
Population (736 records): 43% Common, 47% Frequent, 10% Rare.

Dispersion (706 records): 71% variable, 28% clumped.

Flowering (731 records with: Jan 20, Feb 77, Mar 72, Apr 80, May 85, Jun 54, Jul 67, Aug 29, Sep 23, Oct 137, Nov 61, Dec 26): Buds from Aug to Oct; Flowering from Sep; Peak Flowering from Sep; Over not significant; Fruit from Oct to Feb and Apr to May; Nothing from Jan to Jul. Peak levels at 91% in Sep. Historically recorded as flowering from late Oct and early Nov, fruit ripen in Dec in the north to Jan in the south and persist for a month.



Growth (727 records with: Jan 20, Feb 77, Mar 72, Apr 80, May 84, Jun 54, Jul 67, Aug 30, Sep 23, Oct 137, Nov 57, Dec 26): Much from Nov to Jan; Rare from Jan to Apr, Jun and Nov; None from Jan to Nov. Peak levels at 85% in Dec.



Seedlings (322 records): Absent in 99%: fewer seedlings than prefire adults in 1 case. Seedlings found in Nov.

Fire Survival (50 records): 98% resprouted from underground boles, 2% eliminated from the area by fires.

Age to first flowering: First flowers recorded at 2 years, 50% estimated at 2 years, and 100% recorded at 2 years.

Height (737 records): 49% 0.2-1 m tall, 48% 1-2 m tall, 2% 2-5 m tall.

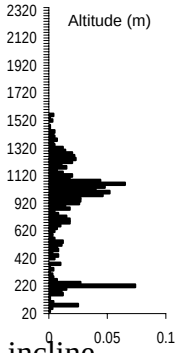
Pollinators (6 records): 67% flies, 33% beetles.

Detailed Pollinators (1 record): Monkey Beetle.

Habitat:

Distance to Ocean (732 records): 100% inland - further than 2 km from coast.

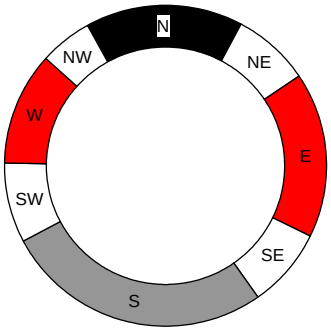
Altitude (732 records): 20 - 1460 m; 520 *lq* - 880 *med* - 960 *uq*m.



Landform (725 records): 82% deep soil, 15% shallow soil, 2% riverine.

Slope (729 records): 45% gentle incline, 30% platform, 12% valley bottom, 6% hill top, 5% steep incline, 2% dunes.

Aspect (496 records): 35% South, 25% East, 22% North, 18% West.



Soil Type (721 records): 70% sandy, 12% loamy, 12% gravelly, 3% rocky, 2% clayey.

Soil Colour (719 records): 36% brown, 24% yellow, 17% grey, 9% orange, 8% red, 5% white.

Geology (671 records): 69% sandstone, 13% shale, 10% Tertiary sands, 4% silcrete or ferricrete, 2% conglomerate.

Vegetation (728 records): 98% shrubland, 1% agricultural lands.

Conservation Status and Threat:

Red Data List Status: Least Concern.

Occurrence (Fynbos): 15 868 km^2 with 11% conserved and 17% lost; Occupancy: 959 km^2 with 9% conserved and 13% lost. Fragmentation index: 2%.

Nature Reserves (732 records): 14% in Nature Reserves - inadequately conserved.
Habitat destruction (725 records): 77% extensive natural habitat, 18% islands, 4% naturally linear habitats.
Alien Invasive Species (705 records): 79% none, 12% Fabaceae (chiefly alien *Acacia*), 3% *Pinus*, 2% Myrtaceae, 2% *Hakea*, 1% other aliens.
Alien Density (705 records): 79% alien-free, 17% sparse, 4% abundant, 1% dense.

Cultivation & Utilization:
Picking (516 records): 100% no sign of picking, 0.2% lightly picked.
Cultivation Status: Plantings - 1 record.
Witch's Broom Infestation: 1 record (0.1%).

Atlassers Notes:
Two slightly different forms growing together 1: a lighter green with leaves about 1.0-1.2 mm wide and 2: a darker blue-green leaf 1.6-2.0 mm side - both sexes of each form so affected (WIJ94041211);
Grazed off (AGR96042503); Heavy grazing pressure ! cattle appear to enjoy the younger shoots (NAH92061701);
Probably used as firewood (AMMY2110602);
30% of plants are senescing often dying back in the middle spreading outwards (NAH94032701); In very poor condition (dwarfed) (NAHY3041601);
No female plants in this population (PMR96111501); Both plants were male (SMRY0083024);
Obviously seed washed down river and far below normal colonies (AGRY0013001);

Confusing Species: Mistaken for *L. linifolium* and *meyerianum*, but neither of these resprout. More usually varieties not noted.
Records of identification queries = 19.
Records of corrected identification queries = 5.

Variation and Taxonomy: No variation noted by atlassers. Plants from the far north have hairless fruit, whereas the Breede River populations have hairy fruit. In cultivation may produce stalked male flowerheads (a feature of *L. galpini* and *linifolium*), but only noted for Nardouw collections. The plants from Nardouw have broader leaves, those from Bo-Langvlei (Williams 107) are herein regarded as var. *flumenlupinum.*
The combination *L. tortum* cannot be made from Thunberg's *Protea torta* (1781) as this name was used by Brown in 1810 for *L. linifolium*. The same applies to *Protea tenuifolia* Thunb. 1803 – Salisbury used it in 1796 for *L. levisanus*. The names *canaliculatum, imbricatum* and *inflexa* are with inadequate types (*nomen nudum*). The name *L. lineare* was first used by Burm. f. in 1768, but is also a *nomen nudum*. Mund annoted a specimen as *pruinosum*, but this has never been published.
Given the geographical separation of the two varieties, these should be of subspecific status.

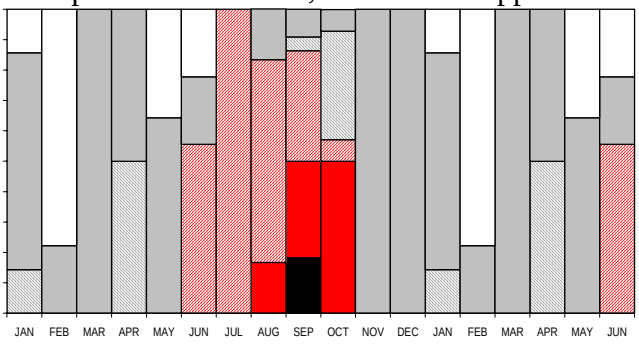
Distribution: Add.
Check phenology for north and south.
INCLUDEPICTURE "C:\\temp\\atlas\\LDBRUNB_m.jpg" * MERGEFORMAT \d

Leucadendron brunioides var. *flumenlupinum* Williams 1972
Graafwater Conebush

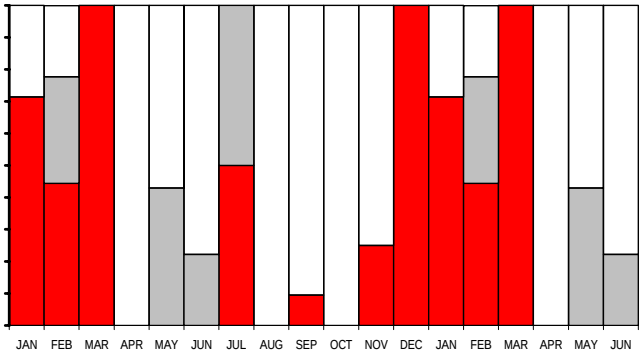
Other Common Names: None known.
Other Scientific Names: *None.*

105 Records

Population (104 records): 8% Common, 64% Frequent, 28% Rare.
Dispersion (95 records): 52% variable, 45% clumped, 2% widespread, 1% evenly distributed.
Flowering (103 records with: Jan 7, Feb 9, Mar 1, Apr 2, May 14, Jun 9, Jul 2, Aug 12, Sep 22, Oct 14, Nov 5, Dec 6): Buds from Jun to Sep; Flowering from Sep to Oct; Peak Flowering from Sep; Over from Apr and Oct; Fruit from Nov to Jun; Nothing from Jan Feb and May to Jun. Peak levels at 93% in Oct. Historically recorded as flowering in Sep with fruit in Dec, thereafter dropped.



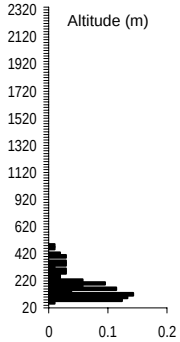
Growth (101 records with: Jan 7, Feb 9, Mar 1, Apr 2, May 14, Jun 9, Jul 2, Aug 12, Sep 21, Oct 14, Nov 4, Dec 6): Much from Nov to Mar; Rare from Feb, May to Jul; None from Jan to Feb, Apr to Nov. Peak levels unreliable at 100 in Mar and Dect.



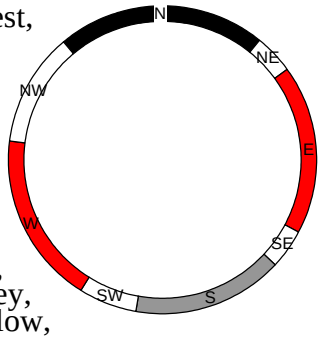
Seedlings (46 records): All without any seedlings present.
Fire Survival (4 records): 100% resprouted from underground boles.
Age to first flowering: First flowers recorded at 100% at 13 years, no data for younger veld.

Height (102 records): 1% 0-0.2 m tall, 19% 0.2-1 m tall, 60% 1-2 m tall, 21% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (105 records): 100% inland - further than 2 km from coast.
Altitude (105 records): 40 - 480 m; 80 $_{lq}$ - 120 $_{med}$ - 160 $_{uq}$m.



Landform (104 records): 95% deep soil, 2% swamp, 2% shallow soil, 1% riverine.
Slope (101 records): 55% platform, 33% gentle incline, 9% valley bottom, 2% dunes, 1% steep incline.
Aspect (50 records): 32% North, 26% West, 21% East, 21% South.



Soil Type (104 records): 95% sandy, 5% loamy.
Soil Colour (100 records): 30% white, 26% brown, 16% grey, 12% orange, 9% yellow, 7% red.
Geology (99 records): 52% Tertiary sands, 45% sandstone, 2% shale, 1% silcrete or ferricrete.
Vegetation (102 records): 98% shrubland, 2% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A4c.
Occurrence (Fynbos): 2 614 km^2 with 0% conserved and 35% lost; Occupancy: 168 km^2 with 0% conserved and 55% lost. Fragmentation index: 6%.
Nature Reserves (105 records): 1% in Nature Reserves - unconserved.
Habitat destruction (101 records): 48% islands, 30% extensive natural habitat, 19% road verges, 4% naturally fragmented habitats.
Alien Invasive Species (99 records): 74% Fabaceae (chiefly alien *Acacia*), 19% none, 3% *Pinus*, 2% Myrtaceae, 1% annual alien grasses, 1% other aliens.
Alien Density (98 records): 19% alien-free, 57% sparse, 18% abundant, 5% dense.

Cultivation & Utilization:
Picking (79 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Old - approaching senescent (NGW96112202);
Only one plant seen on roadside this side of farmers fence (DEB94041101); 2 female plants (NAHY0062701); Single female plant on road verge (NGW96112201); Bushes - 2 males + 2 females (NGW96112202); Plants on narrow verge - almost single row (NSC95083112);

Confusing Species: This species was found to be common in the Sandveld in wet areas. Initially much confusion was caused by plants near Aurora (see Williams 1972), until these were found to be nearly contiguous with other populations. These were assigned to oblong-leaved *L. stellare* by Williams. The following specimens were assigned to this variety: *var. brunoides* from Bo Langvlei: Williams 221, 607 (NBG); *stellare* from Aurora: Williams 500, 1365: NBG). The plants at De Lille (Williams 1141, 1252: NBG) are not as broad and considered to be *var.brunioides*.

Records of identification queries = 45.

Records of corrected identification queries = 39.

Variation and Taxonomy: No variation has been noted. Plants from the upper Olifants Valley and at Nardouw are somewhat intermediate between the two forms.

Given the geographical separation of the two varieties, these should be of subspecific status.

Distribution: Add.

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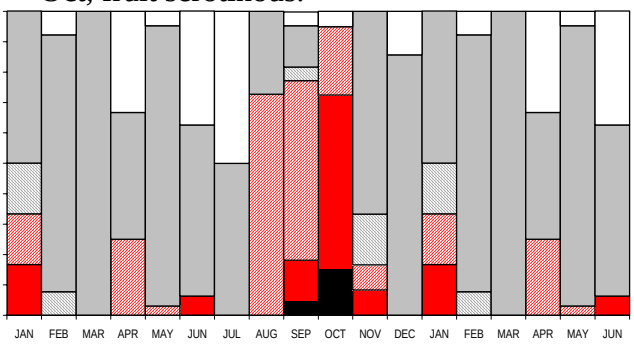
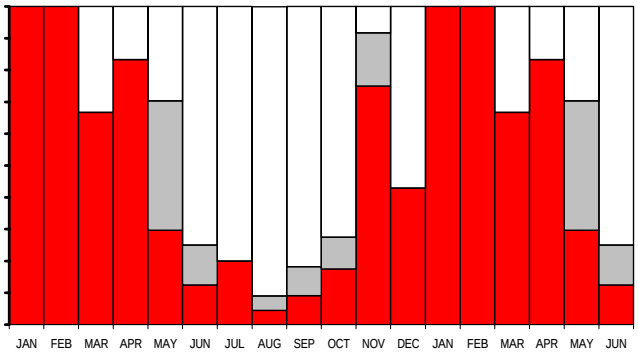
Leucadendron cinereum (Sol. ex Ait.) R.Br. 1789, 1810
Scraggly Conebush
Vaalknopbos

Other Common Names: Aster-leaf Protea, Gray Protea, *Tolbos, Vaaltolbos.*
Other Scientific Names: *asterifolia* (Salisb. ex Knight) 1809, *cinereum* var. *glabrum* Phill. 1913, *globularia* (Lam) 1791, *truncatum* (Thunb) 1806.

233 Records
Population (227 records): 19% Common, 52% Frequent, 28% Rare, 2% Extinct.
Dispersion (210 records): 61% variable, 39% clumped.
Flowering (224 records with: Jan 6, Feb 13, Mar 6, Apr 12, May 64, Jun 16, Jul 4, Aug 22, Sep 22, Oct 40, Nov 12, Dec 7): Buds from Apr and Aug to Oct; Flowering from Oct; Peak Flowering and Over not significant; Fruit from Nov to Aug; Nothing from Apr and Jun to Jul. Peak levels at 95% in Oct. Historically recorded as flowering in Oct, fruit serotinous.



Growth (225 records with: Jan 6, Feb 13, Mar 6, Apr 12, May 64, Jun 16, Jul 5, Aug 22, Sep 22, Oct 40, Nov 12, Dec 7): Much from Nov to May; Rare from May; None from Mar and May to Oct and Dec. Peak levels at 100% from Jan to Feb.

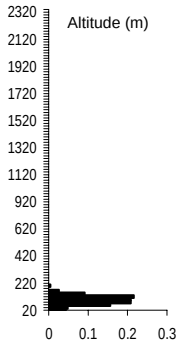


Seedlings (85 records): Absent in 95%: fewer seedlings than prefire adults in 1 case, and more in 1 case. Seedlings found in Jun and Oct.
Fire Survival (13 records): 62% survived by seedlings only, 15% resprouted from underground boles, 15% resprouted from aerial trunks, 8% eliminated from the area by fires.

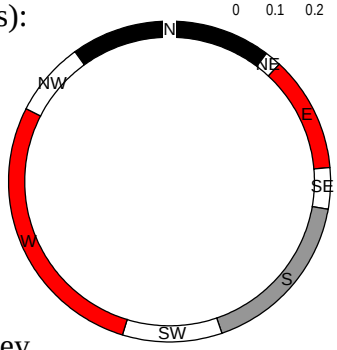
Age to first flowering: First flowers recorded at 3 years, 50% estimated at 3 years, and 100% recorded at 3 years.

Height (226 records): 38% 0.2-1 m tall, 54% 1-2 m tall, 8% 2-5 m tall.
Pollinators (4 records): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (229 records): 100% inland - further than 2 km from coast.
Altitude (229 records): 20 - 160 m; 60 *lq* - 80 *med* - 80 *uq* m.



Landform (229 records): 98% deep soil, 1% swamp.
Slope (226 records): 72% platform, 15% gentle incline, 7% valley bottom, 4% hill top, 3% dunes.
Aspect (117 records): 36% West, 25% North, 24% South, 15% East.



Soil Type (227 records): 92% sandy, 5% clayey, 3% loamy.
Soil Colour (226 records): 38% grey, 31% white, 17% brown, 7% orange, 6% yellow.
Geology (218 records): 83% Tertiary sands, 10% sandstone, 6% shale.
Vegetation (229 records): 99% shrubland, 1% thicket.

Conservation Status and Threat:
Red Data List Status: Vulnerable A2c + 3c + 4c.
Occurrence (Fynbos): 1 661 km^2 with 4% conserved and 37% lost; Occupancy: 235 km^2 with 7% conserved and 39% lost. Fragmentation index: 6%.
Nature Reserves (229 records): 15% in Nature Reserves - inadequately conserved.
Habitat destruction (225 records): 72% extensive natural habitat, 15% islands, 8% road verges, 3% naturally linear habitats, 1% naturally fragmented habitats.
Alien Invasive Species (225 records): 93% Fabaceae (chiefly alien *Acacia*), 4% none, 2% *Pinus*.

Alien Density (225 records): 4% alien-free, 34% sparse, 32% abundant, 25% dense, 4% impenetrable.

Cultivation & Utilization:
Picking (179 records): 100% no sign of picking.
Cultivation Status: Plantings - 2 records.

Atlassers Notes:
Plants were 1.5-2 m high which exceeds the figure of 1 m given by Williams (SHR94090301);
There were an incredible number (100's) of young plants in the part of this site that was burnt (NGF95090303);
Originally atlassed as *L. linifolium* - but all plants were dead - surprising in retrospect: one would have expected *L. levisanus*! Williams noted that this was a small-leaf form! (AGR92030502 + 3);
Males only (AGR99112403); Both plants were male (LYM98052007); 1 male and 1 female plant (NAH92052202); Both males (SMR97111902); Only one female - dead of natural causes (SMR99091702);
Horse pasture? - grazed (GYC95100407); Browsed (SMR97012903); Very disturbing that the plant had been bushcut (IEB99082602);
In wetter soils in depressions - lots of cattle marks (AGR91101305); In a quasi-natural *Watsonia* patch: not known if planted but unlikely (AGR92111401);

Confusing Species: Confused with *L. brunioides* var. *brunioides* and *L. stellare* which both resprout. Also with *L. linifolium* (heads with stalks) and *levisanus* (narrower leaves). Williams notes misidentifications with *L. verticillatum*, which has a different fruit and flower structure.
Records of identification queries = 15.
Records of corrected identification queries = 8.

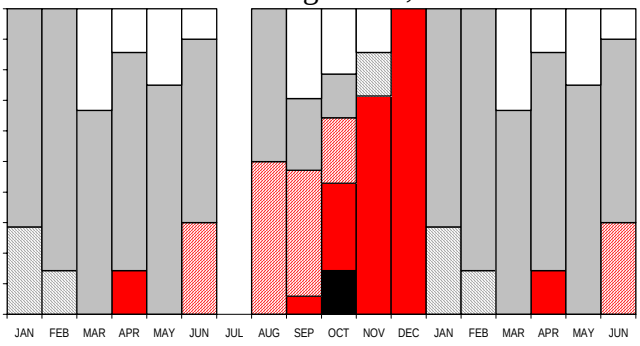
Variation and Taxonomy: The forms used for the description in Williams and SASOL Proteas occur from Malmesbury, Mamre and Philadelphia.
To the south near Kraaifontein are the forms with smaller leaves described by Phillips (1913) as var. *glabrum*. This form is virtually extinct.
To the north of Darling populations have more pubescent leaves – this is the type population (Masson sn) but the exact locality is unknown – probably near Saldanha.

Distribution: Add.
The locality Brittania Bay (Acocks 15222) doubted by Williams could not be located.
INCLUDEPICTURE "C:\\temp\\atlas\\LDCINE_m.jpg" * MERGEFORMAT \d

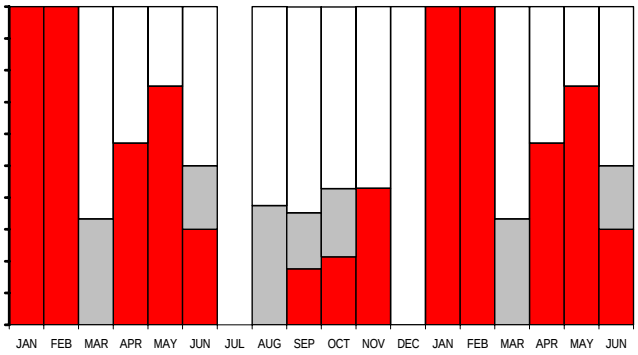
Leucadendron levisanus (L.) Bergius 1753, 1766
Cape Flats Conebush
Sandknoppiesbos

Other Common Names: Spatula-leaf Protea, Three-coloured Protea.
Other Scientific Names: *fusca* (L) 1753, *spatulaefolia* (Salisb. ex Knight) 1809, *tenuifolia* (Salisb) 1796.

90 Records
Population (76 records): 4% Common, 50% Frequent, 42% Rare, 4% Extinct.
Dispersion (64 records): 66% clumped, 30% variable, 5% evenly distributed.
Flowering (85 records with: Jan 7, Feb 7, Mar 3, Apr 7, May 4, Jun 10, Jul 0, Aug 8, Sep 17, Oct 14, Nov 7, Dec 1): Buds from Jun and Aug to Oct; Flowering from Oct to Dec; Peak Flowering not significant; Over from Jan; Fruit from Jan to Sep; Nothing from Mar, May and Sep to Oct. Peak levels unreliable at 86% in Nov. Historically recorded as flowering in Oct, fruit retained.



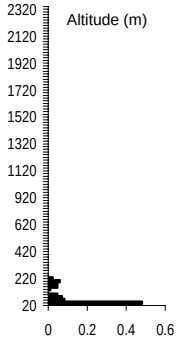
Growth (84 records with: Jan 7, Feb 6, Mar 3, Apr 7, May 4, Jun 10, Jul 0, Aug 8, Sep 17, Oct 14, Nov 7, Dec 1): Much from Jan to Feb, Apr to Jun and Oct to Nov; Rare from Mar, Jun to Oct; None from Mar to Dec. Peak levels at 100% from Jan to Feb.



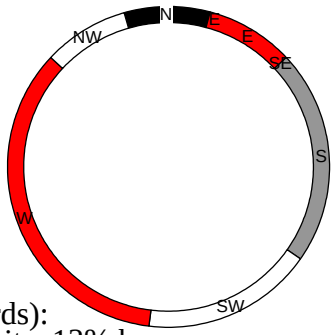
Seedlings (40 records): Absent in 80%: fewer seedlings than prefire adults in 1 case, and more in 3 cases. Seedlings found in Feb, Apr and Sep (2).
Fire Survival (3 records): 67% escaped fires in fire-safe areas, 33% resprouted from underground boles.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2 years, and 100% recorded at 2 years.

Height (85 records): 5% 0-0.2 m tall, 47% 0.2-1 m tall, 48% 1-2 m tall.
Pollinators (1 record): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (71 records): 100% inland - further than 2 km from coast.
Altitude (71 records): 20 - 220 m; 20 $_{lq}$ - 40 $_{med}$ - 40 $_{uq}$m.



Landform (70 records): 96% deep soil, 4% swamp.
Slope (69 records): 61% platform, 19% gentle incline, 16% valley bottom, 4% dunes.
Aspect (21 records): 52% West, 31% South, 10% East, 7% North.



Soil Type (70 records): 91% sandy, 6% loamy, 3% clayey.
Soil Colour (68 records): 56% grey, 29% white, 13% brown, 1% yellow.
Geology (67 records): 64% Tertiary sands, 27% sandstone, 6% shale, 1% granite, 1% silcrete or ferricrete.
Vegetation (70 records): 93% shrubland, 7% suburban.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A4c.
Occurrence (Fynbos): 435 km^2 with 6% conserved and 70% lost; Occupancy: 74 km^2 with 6% conserved and 66% lost. Fragmentation index: 10%.
Nature Reserves (71 records): 20% in Nature Reserves - inadequately conserved.
Habitat destruction (70 records): 40% islands, 31% road verges, 14% extensive natural habitat, 6% corridors, 4% patches, 4% naturally fragmented habitats.
Alien Invasive Species (69 records): 87% Fabaceae (chiefly alien *Acacia*), 7% Myrtaceae, 4% annual alien grasses, 1% *Pinus*.
Alien Density (69 records): 52% sparse, 33% abundant, 14% dense.

Cultivation & Utilization:
Picking (68 records): 99% no sign of picking, 1% lightly picked.
Cultivation Status: Plantings - 13 records (14%).

Atlassers Notes:
With no cones! (ASP94090121);
Both males (AGR92021203); One male plant only seen (AGR92102802); 28 flourishing plants in a small *Restio* area (CHE97061804); Only one individual found! a female - urban encroachment has led to eradication of most plants (CRS93042701); 2 male plants (CRS93061101, LYM98052101); Previously seen dead on this site but no plants were seen (CVV97090201); Area searched well - single clump of ca 15 plants (GED99062201); 1 plant dead (GED99103003); About 10 plants of varying ages male and female on the road verge (JES95012101); A healthy population of about 60-80 plants (NAH96021709); About 17 plants under fence and in ditch - rest of area bushcut (NAHY0081701); There are 18 plants in 2 clumps about 10m apart - one clump is fenced the other is not (NGF95112501);
Rondevlei:
All planted : source: Fish Hoek (AGR94101202 + 3); All have been planted according to Mr Dalton Gibbs - presumed to have been here previously - plants are from the Fish Hoek population (WIJ95010601 + 2); Planted in two clumps near the second watch tower (PVRY0092001);
Plattekloof:
Bushcut! 1/10 of prebushcut population remains - about 15 plants: Escom 2001 mowing fiasco (AGRY1062601); 50 young plants planted from plot #8 to augment historical colony and counteract mowing (AGRY1092309); Although we moved some seed around here after the bushcutting there has been good regeneration from the female bushes as well. Some areas have dense mats of seedlings where females were cut down - quite a bit of dispersal was visible (AGRY2042602); These were plants established as seedlings from block E of about 30 plants planted only 4 could be found: the area was flooded by a sewerage leak and many of the other plants have died con/subsequently. This area reputedly had plants according to Macdowell's records (AGRY2042605); More exciting a female plant we missed next to the prison fence has good recruitment! (AGRY2042602);

Confusing Species: Confused with *L. thymifolium* which has rounded leaves and is not serotinous. Young plants have much longer leaves than mature plants and at this stage are indistinct from *L. cinereum*: the only area where mature plants of these species were confused was near Mamre, Rondeberg and Segarevlei – known intermediate populations (Williams).
Records of identification queries = 4.
Records of corrected identification queries = 1.

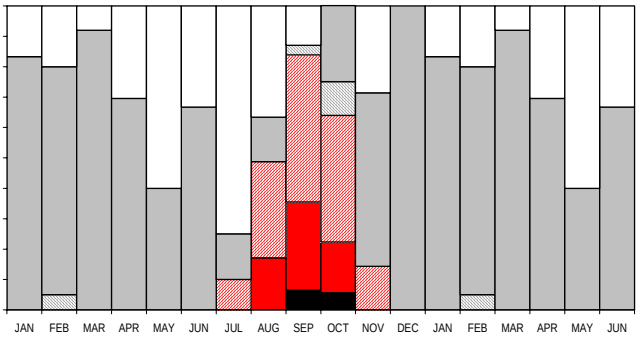
Variation and Taxonomy: Not a variable species, apart from the intermediate populations with *L. cinereum* north of Mamre.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDLEVI_m.jpg" * MERGEFORMAT \d

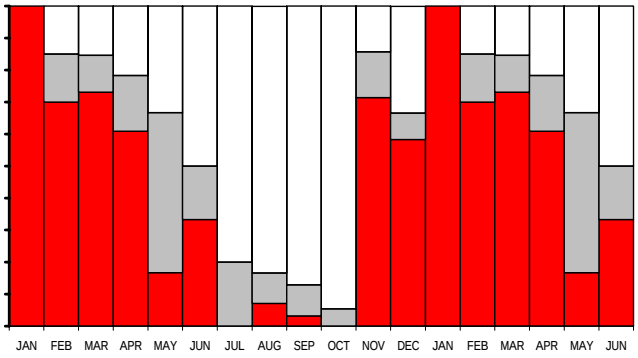
Leucadendron stellare (Sims) Sweet 1805, 1827
Star Conebush
Stertolbos

Other Common Names: Gnidia-leaf Protea, Sweet Star Conebush.
Other Scientific Names: *angustatum* E.Mey. 1844, *empetrifolium* Gand. 1901, *gnidiifolia* (Salisb. ex Knight) 1809, *imbricatum* Wend. 1796, *imbricatum* R.Br. 1810, *imbricatum* var. *canaliculatum* Meisn 1856, *imbricatum* var *dregeanum* Meisn 1856, *laeve* (Thunb.) 1818, *polygaloides* Link 1821.

263 Records
Population (261 records): 1% Abundant, 25% Common, 51% Frequent, 23% Rare.
Dispersion (242 records): 67% variable, 31% clumped, 1% evenly distributed.
Flowering (257 records with: Jan 6, Feb 20, Mar 25, Apr 23, May 30, Jun 6, Jul 20, Aug 41, Sep 31, Oct 36, Nov 7, Dec 12): Buds from Aug to Oct; Flowering from Sep; Peak Flowering and Over not significant; Fruit from Oct to Jun; Nothing from Apr to Aug and Nov. Peak levels at 87% in Sep. Historically recorded as flowering from Sep to Oct, fruits ripening and dropping after 4 months.



Growth (260 records with: Jan 6, Feb 20, Mar 26, Apr 23, May 30, Jun 6, Jul 20, Aug 42, Sep 31, Oct 37, Nov 7, Dec 12): Much from Nov to Apr and Jun; Rare from May; None from Apr to Oct and Dec. Peak levels unreliable at 100% in Jan.

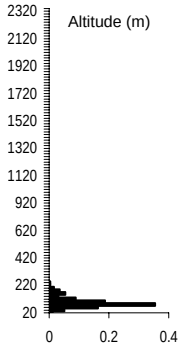


Seedlings (124 records): Absent in 98%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jul.
Fire Survival (10 records): 100% resprouted from underground boles.

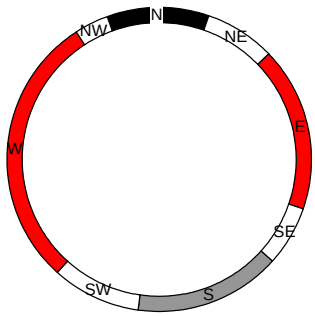
Age to first flowering: First flowers recorded at 5 years, 50% estimated at 3-4 years, and 100% recorded at 5 years.

Height (262 records): 40% 0.2-1 m tall, 48% 1-2 m tall, 11% 2-5 m tall.
Pollinators (10 records): 50% flies, 30% beetles, 20% butterflies or moths.
Detailed Pollinators (2 records): Monkey Beetle, Longhorn Beetle.

Habitat:
Distance to Ocean (256 records): 100% inland - further than 2 km from coast.
Altitude (256 records): 20 - 220 m; 60 *lq* - 80 *med* - 80 *uq* m.



Landform (256 records): 98% deep soil, 2% swamp.
Slope (254 records): 67% platform, 19% gentle incline, 9% valley bottom, 3% hill top, 1% steep incline.
Aspect (136 records): 36% West, 25% East, 22% South, 17% North.



Soil Type (252 records): 57% sandy, 26% loamy, 11% clayey, 7% gravelly.
Soil Colour (251 records): 40% brown, 22% orange, 14% grey, 9% white, 9% yellow, 7% red.
Geology (236 records): 49% shale, 34% Tertiary sands, 14% sandstone, 3% silcrete or ferricrete, 0.4% conglomerate.
Vegetation (254 records): 94% shrubland, 4% agricultural lands, 1% grassland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A2c.
Occurrence (Total and (Fynbos)): 4 727 and 1 518 km^2 with 1% (3%) conserved and 81% (59%) lost; Occupancy: 290 km^2 with 6% conserved and 66% lost. Fragmentation index: 6%.
Nature Reserves (256 records): 22% in Nature Reserves.

Habitat destruction (254 records): 52% extensive natural habitat, 26% islands, 20% road verges, 1% naturally linear habitats.
Alien Invasive Species (251 records): 57% Fabaceae (chiefly alien *Acacia*), 32% none, 5% annual alien grasses, 4% *Pinus*, 2% Myrtaceae.
Alien Density (250 records): 32% alien-free, 40% sparse, 19% abundant, 9% dense.

Cultivation & Utilization:
Picking (215 records): 100% no sign of picking.
Cultivation Status: Plantings - 1 record.
Witch's Broom Infestation: 1 record (0.4%).

Atlassers Notes:
Cones busy releasing seeds (AGR92051708); Old seedheads still with a few odd seeds (AGRY0072703); Much of the seed had been dropped but enough was still in the cone to warrant a flowering code of ' in cone' (NGF96051903);
Big leaf female form - males normal - is this female a hybrid or a leakage from *L. brunioides* var. *flumenlupinum* a few km to the north? (AGR96102518); Large-leaved form (WIJ94081904); Big leaf form (WIJ95101505);
Plants Heavily Grazed By Cattle (NAH98082501);
Many Plants On The Verge Had Been Bulldozed Out! (SMRY0020902);
One plant was found with witches broom which I considered to be unusual (NGF96051903);

Confusing Species: Confused with *L. cinereum, levisanus* and *thymifolium,* which do not resprout. Northern-most populations confused with *brunioides* var. *flumenlupinum* which has broader more oblong leaves, although a few intermediate populations were found.
Records of identification queries = 15.
Records of corrected identification queries = 6.

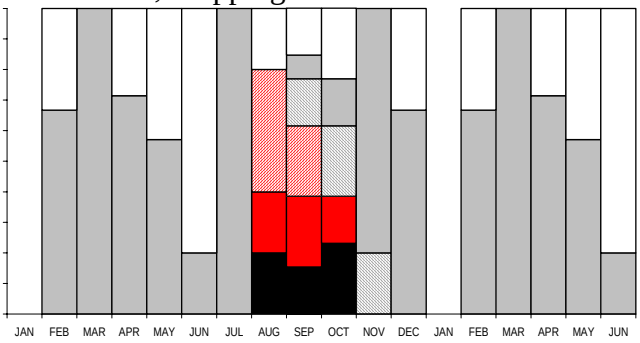
Variation and Taxonomy: The earliest name is *Protea imbricata* Wend. 1796, but it is invalid as Thunberg used the name in 1781 (for what is now *Sorocephalus)*.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSLLR_m.jpg" * MERGEFORMAT \d

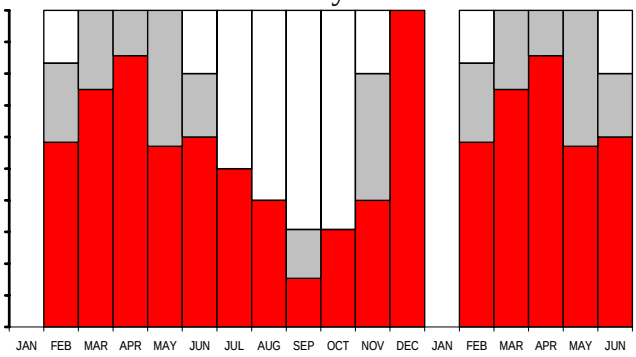
Leucadendron thymifolium (Salisb. ex Kn.) William 1809, 1972
Malmesbury Conebush
Swartveldknoppiesbos

Other Common Names: Thyme-leaf Protea, *Katsterttolbos.*
Other Scientific Names: *buxifolium* R.Br. 1810, *wendlandi* Poir 1816.

79 Records
Population (74 records): 1% Abundant, 28% Common, 51% Frequent, 16% Rare, 3% Extinct.
Dispersion (69 records): 62% variable, 36% clumped, 1% evenly distributed.
Flowering (76 records with: Jan 0, Feb 12, Mar 4, Apr 7, May 7, Jun 5, Jul 2, Aug 5, Sep 13, Oct 13, Nov 5, Dec 3): Buds from Aug to Sep; Flowering from Aug to Sep; Peak Flowering from Aug to Oct; Over from Oct to Nov; Fruit from Nov to Jul; Nothing from Dec to Feb and Apr to Jun and Oct. Peak levels at 80% in Aug. Historically recorded as flowering from Aug to Sep, with fruit until Feb, dropping after 5 months.



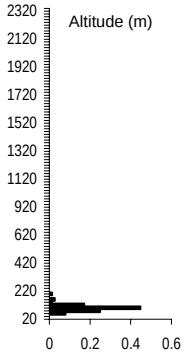
Growth (76 records with: Jan 0, Feb 12, Mar 4, Apr 7, May 7, Jun 5, Jul 2, Aug 5, Sep 13, Oct 13, Nov 5, Dec 3): Much from Oct to Aug; Rare from Feb to Mar, May to Jun and Nov; None from Jun to Nov. Peak levels at 100% from Mar to May and Dec.



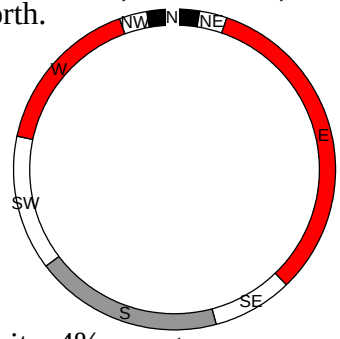
Seedlings (24 records): Absent in 75%: more seedlings than prefire adults in 3 cases. Seedlings found in Mar, Jun and Oct.
Fire Survival (8 records): 88% survived by seedlings only, 13% resprouted from aerial trunks.
Age to first flowering: First flowers recorded at 5 years, 50% estimated at 4 years, and 100% recorded at 5 years.

Height (76 records): 5% 0-0.2 m tall, 25% 0.2-1 m tall, 55% 1-2 m tall, 14% 2-5 m tall.
Pollinators (5 records): 60% beetles, 40% flies.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (75 records): 100% inland - further than 2 km from coast.
Altitude (75 records): 40 - 160 m; 60 *lq* - 80 *med* - 80 *uq* m.



Landform (75 records): 100% deep soil.
Slope (75 records): 69% platform, 23% gentle incline, 4% hill top, 4% valley bottom.
Aspect (36 records): 39% East, 29% South, 25% West, 7% North.



Soil Type (73 records): 47% sandy, 30% clayey, 21% loamy, 1% peaty, 1% gravelly.
Soil Colour (72 records): 39% brown, 38% grey, 14% white, 4% orange, 3% yellow, 3% red.
Geology (72 records): 49% shale, 31% Tertiary sands, 11% sandstone, 6% granite, 3% silcrete or ferricrete, 1% conglomerate.
Vegetation (75 records): 99% shrubland, 1% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A2c + 4c.
Occurrence (Fynbos): 65 km^2 with 1% conserved and 65% lost; Occupancy: 71 km^2 with 1% conserved and 68% lost. Fragmentation index: 24%.
Nature Reserves (75 records): 15% in Nature Reserves - inadequately conserved.
Habitat destruction (75 records): 37% road verges, 37% extensive natural habitat, 15% islands, 4% corridors, 4% naturally fragmented habitats, 3% naturally linear habitats.

Alien Invasive Species (73 records):
78% Fabaceae (chiefly alien *Acacia*),
11% none, 5% annual alien grasses,
4% Myrtaceae, 1% *Pinus*.
Alien Density (73 records): 11% alien-free,
36% sparse, 25% abundant, 25% dense,
4% impenetrable.

Cultivation & Utilization:
Picking (49 records): 100% no sign of picking.
Cultivation Status: Plantings - 1 records (1%).

Atlassers Notes:
Spreading into abandoned lands and also in disturbed areas on the road verge (AGRY2021502); Seedlings well beyond parents: all dead on south side (APE93060502); Appear all killed with no seedlings (ASP94072109);
Horse pasture? Grazed, some heavily (GYC95100407);
There were 50 plants at this site (NGFY2021503);

Confusing Species: Confused with *L. stellare*, which resprouts. Also with *L. cinereum* and *levisanus*, which are serotinous.
Records of identification queries = 7.
Records of corrected identification queries = 3.

Variation and Taxonomy: No variation noted.

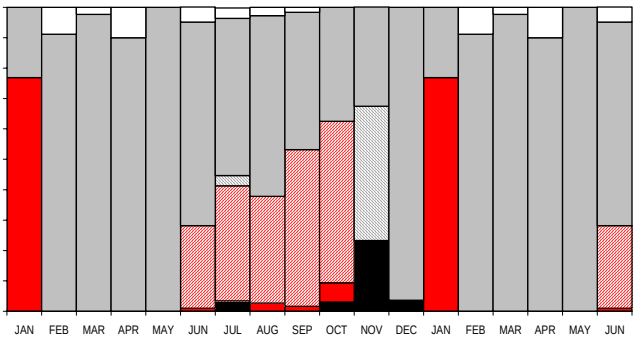
Distribution: Add.
Find herb specimens vdMerwe and Bachmann that Williams refers to.
INCLUDEPICTURE
"C:\\temp\\atlas\\LDTHYM_m.jpg" *
MERGEFORMAT \d

Leucadendron galpinii Phill. & Hutch. 1912
Hairless Conebush
Droevlaktetolbos

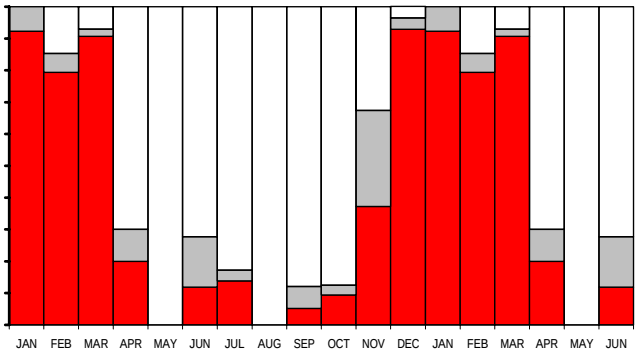
Other Common Names: Galpin's Conebush, Scythe-leaf Protea, Silver-cone Conebush, Silver-tops Conebush, *Silwertol, Vaalbos.*
Other Scientific Names: *None.*

478 Records

Population (475 records): 35% Common, 55% Frequent, 10% Rare.
Dispersion (440 records): 72% variable, 22% clumped, 5% widespread, 2% evenly distributed.
Flowering (447 records with: Jan 13, Feb 34, Mar 44, Apr 10, May 12, Jun 103, Jul 29, Aug 37, Sep 62, Oct 32, Nov 43, Dec 28): Buds from Jun to Oct; Flowering from Jan; Peak Flowering from Nov; Over from Nov; Fruit from all year round; Nothing not significant. Peak levels suspect: probably at 68% in Nov. Historically recorded as flowering from late Oct to early Nov, serotinous.



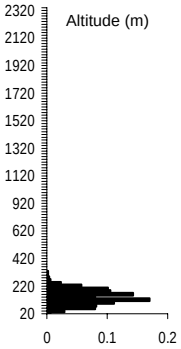
Growth (438 records with: Jan 13, Feb 34, Mar 43, Apr 10, May 12, Jun 101, Jul 29, Aug 35, Sep 58, Oct 32, Nov 43, Dec 28): Much from Nov to Apr; Rare from Nov; None from Apr to Nov. Peak levels at 100% in Jan.



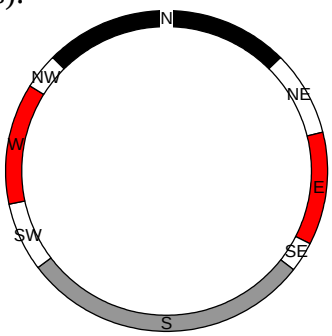
Seedlings (183 records): Absent in 99%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jul.
Fire Survival (1 record): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 3 years, 50% estimated at 4 years, and 100% recorded at 7 years.

Height (456 records): 18% 0.2-1 m tall, 64% 1-2 m tall, 17% 2-5 m tall.
Pollinators (5 records): 80% flies, 20% bees or wasps.
Detailed Pollinators (2 records): Wasp (unspecified), Honey Bee.

Habitat:
Distance to Ocean (474 records): 94% inland - further than 2 km from coast.
Altitude (474 records): 20 - 300 m; 80 $_{lq}$ - 120 $_{med}$ - 120 $_{uq}$m.



Landform (472 records): 92% deep soil, 8% shallow soil.
Slope (470 records): 39% platform, 31% gentle incline, 16% valley bottom, 6% dunes, 6% hill top, 2% steep incline.
Aspect (224 records): 35% South, 31% North, 17% West, 16% East.



Soil Type (464 records): 90% sandy, 8% loamy, 1% clayey.
Soil Colour (459 records): 34% brown, 26% grey, 15% red, 11% orange, 9% white, 6% yellow.
Geology (445 records): 52% Tertiary sands, 29% limestone, 12% sandstone, 6% silcrete or ferricrete.
Vegetation (466 records): 96% shrubland, 2% thicket, 2% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Vulnerable A4c.
Occurrence (Fynbos): 2 057 km^2 with 11% conserved and 21% lost; Occupancy: 491 km^2 with 14% conserved and 24% lost. Fragmentation index: 17%.
Nature Reserves (474 records): 17% in Nature Reserves - inadequately conserved.
Habitat destruction (453 records): 63% extensive natural habitat, 20% islands,

10% road verges, 4% naturally linear habitats, 3% naturally fragmented habitats.
Alien Invasive Species (455 records): 69% Fabaceae (chiefly alien *Acacia*), 22% none, 7% *Pinus*, 2% Myrtaceae.
Alien Density (455 records): 22% alien-free, 47% sparse, 16% abundant, 14% dense.

Cultivation & Utilization:
Picking (314 records): 100% no sign of picking.
Cultivation Status: Plantings - 2 records.
Witch's Broom Infestation: 1 record (0.2%).

Atlassers Notes:
Lots of damage - Eland? (APE92080118);
Male (AGRY0061615); Female (AGRY0061616);
Plus 4 Dead (CFRY0061704); I wonder how long these will survive! only thing in their favour is a road reserve (VJK97100102);
Occurring on farm land and on road verges (WMPY0061614);

Confusing Species: Confused with *L. linifolium* which has grey (not silver) smaller leaves.
Records of identification queries = 8.
Records of corrected identification queries = 3.

Variation and Taxonomy: No variation noted.

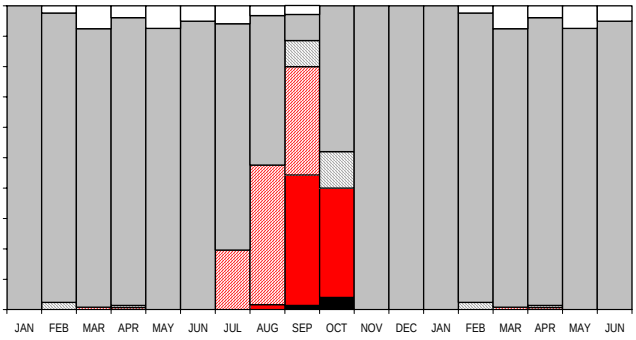
Distribution: Add.
Great Brak River 1894 (Schlechter 5761)
Sandberg near Robertson 1910 (Pearson 3747)
INCLUDEPICTURE "C:\\temp\\atlas\\LDGALP_m.jpg" * MERGEFORMAT \d

Leucadendron linifolium (Jacq.) R.Br. 1797, 1810
Line-leaf Conebush
Duineknoppiesbos

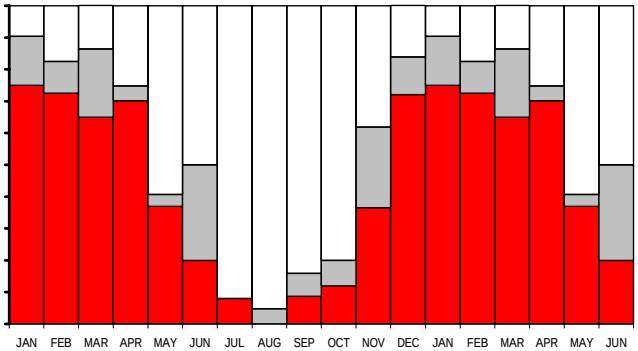
Other Common Names: Globularia-leaf Protea, Long-stem Protea, Silvertops, Tortum, *Knoppiesbos, Kraaltolbos, Vleirosie, Vleitolbos, Waterbossie.*
Other Scientific Names: *cinerea* (Willd.) 1798, *densa* (Willd.) 1813, *fusciflora* (Jacq.) 1797, *globulariaefolia* (Salisb. ex Knight) 1809, *longicaule* (Salisb. ex Knight) 1809, *pedunculatum* Meisn 1856, *tortum* R.Br. 1810.

900 Records

Population (860 records): 3% Abundant, 45% Common, 42% Frequent, 10% Rare.
Dispersion (695 records): 81% variable, 16% clumped, 2% widespread, 1% evenly distributed.
Flowering (753 records with: Jan 52, Feb 42, Mar 120, Apr 152, May 27, Jun 20, Jul 51, Aug 63, Sep 70, Oct 25, Nov 63, Dec 68): Buds from Jul to Sep; Flowering from Sep to Oct; Peak Flowering and Over not significant; Fruit from Oct to Aug; Nothing not significant. Peak levels at 89% in Sep. Historically recorded as flowering from Sep to Oct, fruit serotinous.



Growth (744 records with: Jan 52, Feb 40, Mar 117, Apr 151, May 27, Jun 20, Jul 50, Aug 62, Sep 69, Oct 25, Nov 63, Dec 68): Much from Nov to Jun; Rare from Mar, Jun and Nov; None from Apr to Nov. Peak levels at 90% in Jan.

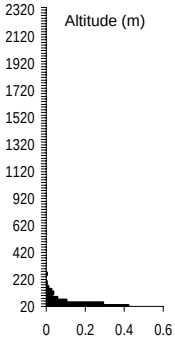


Seedlings (316 records): Absent in 95%: fewer seedlings than prefire adults in 5 cases, and more in 3 cases. Seedlings found in Jan (2), Feb, Jul, Aug (2), Sep and Dec.

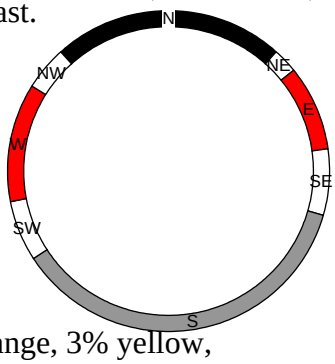
Fire Survival (26 records): 92% survived by seedlings only, 8% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 5 years.

Height (751 records): 1% 0-0.2 m tall, 64% 0.2-1 m tall, 32% 1-2 m tall, 3% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (890 records): 91% inland - further than 2 km from coast.
Altitude (890 records): 20 - 340 m; 0 $_{lq}$ - 20 $_{med}$ - 20 $_{uq}$m.



Landform (756 records): 83% deep soil, 9% swamp, 6% shallow soil, 1% lake edge.
Slope (751 records): 64% platform, 18% gentle incline, 12% valley bottom, 4% dunes, 2% hill top.
Aspect (301 records): 43% South, 27% North, 18% West, 13% East.



Soil Type (731 records): 60% sandy, 21% loamy, 12% clayey, 5% gravelly.
Soil Colour (729 records): 47% grey, 34% brown, 10% white, 3% orange, 3% yellow, 2% black.
Geology (742 records): 24% sandstone, 23% limestone, 22% shale, 18% silcrete or ferricrete, 13% Tertiary sands.
Vegetation (881 records): 98% shrubland, 2% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Vulnerable A2c.
Occurrence (Fynbos): 4 502 km^2 with 19% conserved and 34% lost; Occupancy: 854 km^2 with 24% conserved and 43% lost. Fragmentation index: 8%.

Nature Reserves (890 records): 24% in Nature Reserves.
Habitat destruction (743 records): 66% extensive natural habitat, 17% islands, 14% road verges, 2% naturally linear habitats, 1% naturally fragmented habitats.
Alien Invasive Species (738 records): 82% Fabaceae (chiefly alien *Acacia*), 10% none, 4% Myrtaceae, 3% *Pinus*.
Alien Density (736 records): 10% alien-free, 42% sparse, 29% abundant, 14% dense, 5% impenetrable.

Cultivation & Utilization:
Picking (532 records): 99% no sign of picking, 0.8% severely picked, 0.4% lightly picked.
Cultivation Status: Plantings - 5 records (0.6%), Escapes - 3 records (0.3%).

Atlassers Notes:
Cones to 8 mm diameter (OGM97031504);
Very poor specimens (AJT95042812);
Lots of chopping off of branches by a rodent in several places - piles of branches found (AGRY0072001);
Invading fallow lands (AGRY1012101); On shaley soil at roadside : the others across a field on limestone ridge (SMR99052008); A clump near the track didn't look planted but could have spread from another orchard or got there accidentally in seed (SMRY0041201); Magic! Plot mostly limestone pavement with round pot plant size holes colonized by plants (SMRY1031411);
1 female seen (AGRY2092614);
Proteas in clear zones around water – *L. linifolium* outside of wetland area (AGR98060619);

Confusing Species: A single inexplicable case of misidentification with *L. spissifolium*.
Records of identification queries = 9.
Records of corrected identification queries = 1.

Variation and Taxonomy: A manuscript name is *passerina* Hort, it has never been published. Jacq described the male as *Protea linifolia* and female as *P. fusciflora* – Williams chose the former as the type as the latter has been applied in error to *L. brunioides.*
Populations with the largest leaves and floral parts occur at Onrus to Hermanus, with those to the east and west being smaller in these features. However, atlassers did not note these differences.

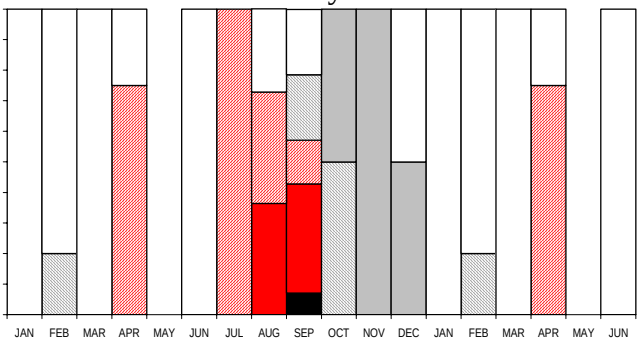
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDLINI_m.jpg" * MERGEFORMAT \d

Leucadendron concavum Williams 1969
Pakhuis Conebush

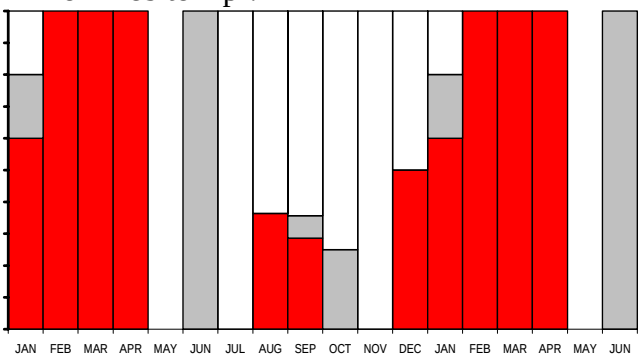
Other Common Names: None known.
Other Scientific Names: *None.*

59 Records

Population (59 records): 2% Abundant, 61% Common, 32% Frequent, 5% Rare.
Dispersion (59 records): 64% variable, 24% clumped, 8% widespread, 3% evenly distributed.
Flowering (59 records with: Jan 5, Feb 5, Mar 7, Apr 4, May 0, Jun 1, Jul 3, Aug 11, Sep 14, Oct 4, Nov 1, Dec 4): Buds from Apr and Jul to Aug; Flowering from Aug to Sep; Peak Flowering not significant; Over from Feb and Sep to Oct; Fruit from Oct to Dec; Nothing from Dec to Sep. Peak levels unreliable at 79% in Sep. Historically recorded as flowering in Sep, fruits retained to Nov after which they are released.



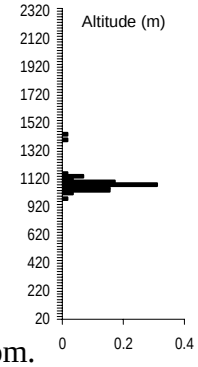
Growth (59 records with: Jan 5, Feb 5, Mar 7, Apr 4, May 0, Jun 1, Jul 3, Aug 11, Sep 14, Oct 4, Nov 1, Dec 4): Much from Dec to Apr and Aug to Sep; Rare from Oct; None from Jul to Jan. Peak levels unreliable at 100% from Feb to Apr.



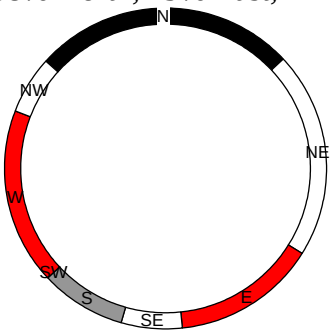
Seedlings (32 records): Absent in 81%: fewer seedlings than prefire adults in 2 cases, and more in 1 case. Seedlings found in Jan, Sep and Oct.
Fire Survival (11 records): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 4 years, 50% estimated at 3-4 years, and 100% recorded at 4 years.

Height (59 records): 7% 0-0.2 m tall, 47% 0.2-1 m tall, 46% 1-2 m tall.
Pollinators (1 record): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (58 records): 100% inland - further than 2 km from coast.
Altitude (58 records): 860 - 1340 m; 940 *lq* - 960 *med* - 980 *uq* m.



Landform (57 records): 89% deep soil, 9% shallow soil, 2% rocky outcrops.
Slope (57 records): 46% gentle incline, 28% platform, 16% hill top, 11% valley bottom.
Aspect (34 records): 38% North, 29% East, 21% West, 12% South.



Soil Type (57 records): 95% sandy, 4% gravelly, 2% loamy.
Soil Colour (57 records): 40% grey, 37% brown, 12% white, 5% yellow, 5% orange.
Geology (57 records): 100% sandstone.
Vegetation (57 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Endangered B1a(i)c(iv) + 2a(i)c(iv).
Occurrence (Fynbos): 19 km^2 with 98% conserved and 1% lost; Occupancy: 20 km^2 with 96% conserved and 0% lost. Fragmentation index: 95%.
Nature Reserves (58 records): 100% in Nature Reserves - well conserved.
Habitat destruction (55 records): 95% extensive natural habitat, 4% naturally fragmented habitats, 2% islands.
Alien Invasive Species (51 records): 100% none.
Alien Density (51 records): 100% alien-free.

Cultivation & Utilization:
Picking (45 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:

More females than males (LKAY4112101);
About 20 plants seen (LKAY4112101);

Confusing Species: Misidentified with *L. dubium* (which has smaller leaves), *L. glaberrimum* (which is an entirely different looking plant) and *L. calligerum* when not in flower.
Records of identification queries = 6.
Records of corrected identification queries = 4.

Variation and Taxonomy: No variation noted.

Distribution:
Thought to be wind pollinated. Add.
INCLUDEPICTURE
"C:\\temp\\atlas\\LDCONC_m.jpg" *
MERGEFORMAT \d

Leucadendron dubium Buek. ex Phill. & Hutch 1912

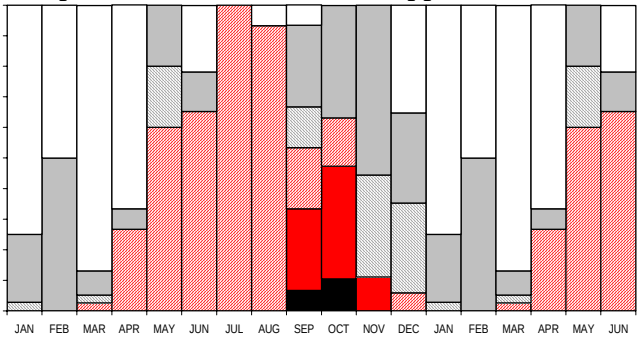
Cedarberg Conebush

Vuurslaanbos

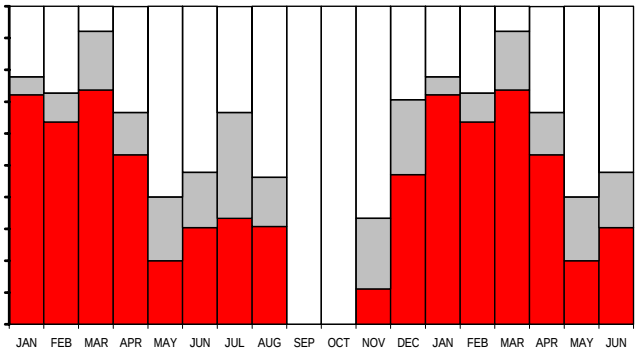
Other Common Names: Beater-bush Conebush.
Other Scientific Names: *buxifolium* var. *dubium* Meisn. 1856, *dubium* Buek in Drege 1844.

209 Records

Population (205 records): 31% Common, 59% Frequent, 10% Rare.
Dispersion (198 records): 55% variable, 33% clumped, 8% widespread, 4% evenly distributed.
Flowering (207 records with: Jan 36, Feb 12, Mar 38, Apr 15, May 5, Jun 23, Jul 3, Aug 15, Sep 15, Oct 19, Nov 9, Dec 17): Buds from Apr to Sep; Flowering from Sep to Oct; Peak Flowering not significant; Over from Nov to Dec; Fruit from Sep to Feb; Nothing from Dec to Apr and Jun. Peak levels at 67% in Sep. Historically recorded as flowering from late Aug to early Sep, fruit ripen in late Nov and are dropped.

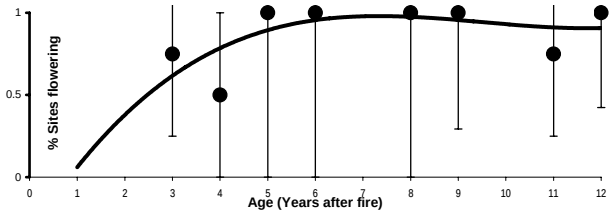


Growth (204 records with: Jan 36, Feb 11, Mar 38, Apr 15, May 5, Jun 23, Jul 3, Aug 13, Sep 15, Oct 19, Nov 9, Dec 17): Much from Dec to Aug; Rare from May and Nov to Dec; None from Apr to Feb. Peak levels at 92% in Mar.



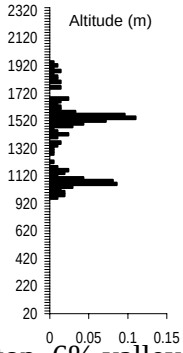
Seedlings (87 records): Absent in 84%: fewer seedlings than prefire adults in 5 cases, and more in 2 cases. Seedlings found in Jan (3), Mar, Jul, Oct and Nov.
Fire Survival (14 records): 93% survived by seedlings only, 7% eliminated from the area by fires.

Age to first flowering: First flowers recorded at 3 years, 50% estimated at 3-4 years, and 100% recorded at 5 years.

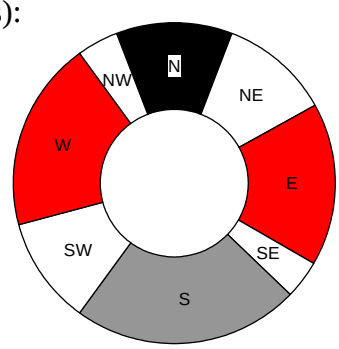


Height (205 records): 3% 0-0.2 m tall, 59% 0.2-1 m tall, 36% 1-2 m tall, 1% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (209 records): 100% inland - further than 2 km from coast.
Altitude (209 records): 840 - 1840 m; 960 *lq* - 1320 *med* - 1440 *uq*m.



Landform (208 records): 73% deep soil, 20% shallow soil, 6% rocky outcrops, 1.0% riverine.
Slope (208 records): 59% gentle incline, 24% platform, 6% hill top, 6% valley bottom, 5% steep incline.
Aspect (163 records): 29% South, 28% West, 25% East, 18% North.



Soil Type (208 records): 77% sandy, 11% gravelly, 7% rocky, 4% loamy.
Soil Colour (207 records): 46% grey, 25% brown, 15% white, 8% yellow, 4% orange.
Geology (203 records): 85% sandstone, 11% shale, 2% silcrete or ferricrete, 2% Tertiary sands.
Vegetation (207 records): 98% shrubland, 1% grassland, 1% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 611 km^2 with 49% conserved and 2% lost; Occupancy: 168 km^2 with 67% conserved and 1% lost. Fragmentation index: 22%.
Nature Reserves (209 records): 76% in Nature Reserves - well conserved.
Habitat destruction (198 records): 89% extensive natural habitat, 8% islands, 2% naturally linear habitats, 2% naturally fragmented habitats.

Alien Invasive Species (196 records): 94% none, 6% *Pinus*.
Alien Density (196 records): 94% alien-free, 6% sparse.

Cultivation & Utilization:
Picking (133 records): 99% no sign of picking, 0.8% severely picked.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Old plants reach a height of 2 m (SHR95100802);
Most plants have dropped their cones: are they non-serotinous? *Yes* (NAH95012202);
Chopped out and veld bushcut for new rooibos tea plantations (AGRY5122906 + 8); Cut plants have been used to repair erosion in the track (NGF97032109);
Most of the plants growing in rooibos tea field (LYM98062709);
Only one specimen - female but there must have been more somewhere around (AKS93021801);

Confusing Species: Misidentified as *L. concavum*, which has much bigger leaves and inexplicably as *L. dregei.*
Records of identification queries = 14
Records of corrected identification queries = 6.

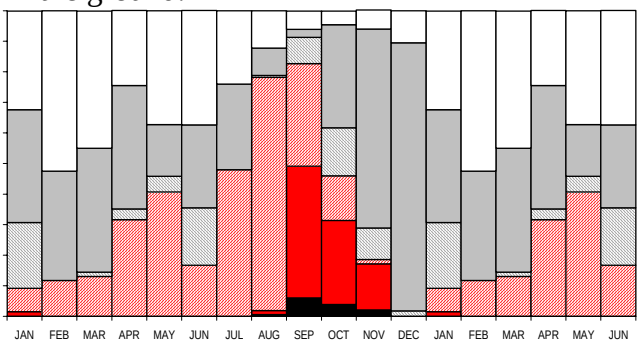
Variation and Taxonomy: No significant variation known or noted.

Distribution: Add.
Thought to be wind pollinated.
INCLUDEPICTURE "C:\\temp\\atlas\\LDDUBI_m.jpg" * MERGEFORMAT \d

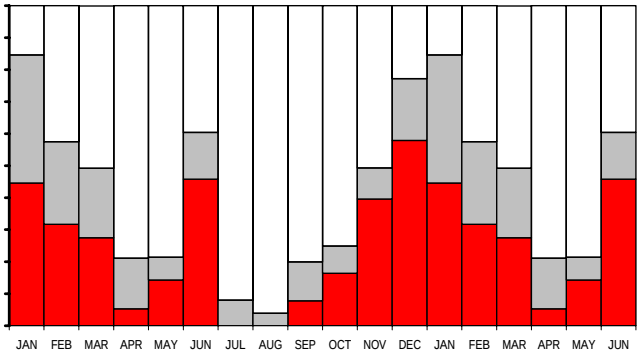
Leucadendron arcuatum (Lam.) Williams 1791, 1967
Red-edge Conebush
Kruiptolbos

Other Common Names: Ceres Goldtips, Crassula-leaf Protea.
Other Scientific Names: *crassifolium* R.Br. 1810, *crassulifolium* (Salisb. ex Knight) 1809, *mutica* (Poir.) 1816, *spathulatum* R.Br. 1810, *squarrosum* R.Br. 1810.

1221 Records
Population (1216 records): 20% Common, 61% Frequent, 18% Rare.
Dispersion (1118 records): 74% variable, 22% clumped, 4% widespread.
Flowering (1212 records with: Jan 65, Feb 120, Mar 69, Apr 57, May 59, Jun 48, Jul 25, Aug 156, Sep 232, Oct 178, Nov 146, Dec 57): Buds from Apr to May and Jul to Sep; Flowering from Sep to Oct; Peak Flowering not significant; Over from Jan; Fruit from Oct to Jul; Nothing from Jan to Jul. Peak levels at 91% in Sep. Historically recorded as flowering from late Sep to early Oct, fruit ripen in 4 months and immediately drop to the ground.

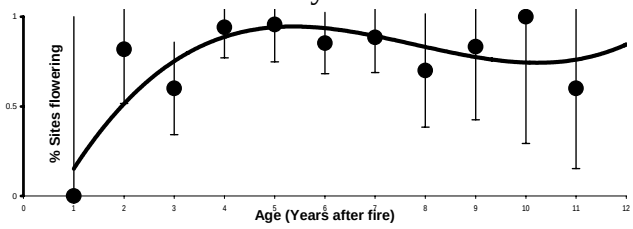


Growth (1204 records with: Jan 65, Feb 120, Mar 69, Apr 57, May 56, Jun 48, Jul 25, Aug 155, Sep 231, Oct 177, Nov 144, Dec 57): Much from Nov to Mar and Jun; Rare from Jan to Mar; None from Feb to Dec. Peak levels at 85% in Jan.



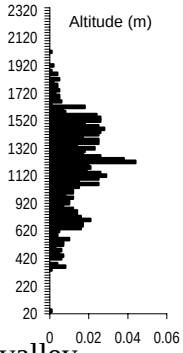
Seedlings (461 records): Absent in 95%: fewer seedlings than prefire adults in 11 cases, and more in 1 case. Seedlings found in Mar (2), Jun (6), Sep (3) and Dec.
Fire Survival (169 records): 93% resprouted from underground boles, 5% escaped fires in fire-safe areas, 1% survived by seedlings only, 1% resprouted from aerial trunks.

Age to first flowering: First flowers recorded at 2 years, 50% estimated at 2 years, and 100% recorded at 10 years.

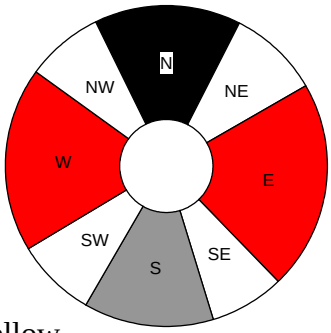


Height (1210 records): 20% 0-0.2 m tall, 76% 0.2-1 m tall, 3% 1-2 m tall.
Pollinators (17 records): 59% beetles, 29% none observed, 12% flies.
Detailed Pollinators (5 records): Monkey Beetle.

Habitat:
Distance to Ocean (1215 records): 100% inland - further than 2 km from coast.
Altitude (1215 records): 320 - 1920 m; 860 *lq* - 1120 *med* - 1280 *uq*m.



Landform (1202 records): 62% deep soil, 33% shallow soil, 4% rocky outcrops.
Slope (1190 records): 49% gentle incline, 26% steep incline, 15% platform, 6% hill top, 3% valley bottom.
Aspect (1008 records): 29% East, 27% West, 23% North, 20% South.



Soil Type (1197 records): 59% sandy, 16% gravelly, 12% rocky, 11% loamy, 2% clayey.
Soil Colour (1191 records): 46% grey, 32% brown, 14% white, 3% yellow, 2% orange, 1% black.
Geology (1187 records): 90% sandstone, 9% shale.
Vegetation (1199 records): 99% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 4 660 km^2 with 24% conserved and 12% lost; Occupancy: 979 km^2 with 36% conserved and 5% lost. Fragmentation index: 17%.
Nature Reserves (1215 records): 55% in Nature Reserves - well conserved.
Habitat destruction (1178 records): 93% extensive natural habitat, 3% islands,

2% naturally fragmented habitats,
2% naturally linear habitats.
Alien Invasive Species (1158 records): 77% none, 18% *Pinus*, 2% Fabaceae (chiefly alien *Acacia*), 2% *Hakea*.
Alien Density (1158 records): 77% alien-free, 20% sparse, 2% abundant.

Cultivation & Utilization:
Picking (722 records): 100% no sign of picking.
Cultivation Status: Plantings - 1 record.
Witch's Broom Infestation: 1 record (0.08%).

Atlassers Notes:
Single stem young plants! (AKS94091204); Some sprawl, some semi–upright (WIJY0102807); Very unusual creeping form (AMMY3112620-22); Creeping (JBB99122201); Sprawling plant (WIJ95020404); One "baster" conebush with growth (mat of leaves) at ground level & single stem up (AWAY0100407);
Very broad leaf form! (AGR95020508); Leaves 20-30 mm wide - very wide (AGRY1022119); With wide big leaves (AGRY1022120); Narrow leaf (WIJ96072811);
All males (APE92101807); Predominantly male (JAT93013001);
Many young plants around dead bushes (AWAY0102604); 2 patches have a cluster of 4 dead plants (AGRY4110609);
Only young plants that have not bloomed yet have new growth (AWA99092405); Many small plants with new growth (AWA99092701);
Second flowering this year (AGR98080803 + 5, SAS98080806);
Strong vanilla scent (AGRY4110606);

Confusing Species: Atlassers confused this with *L. glaberrimum susp. glaberrimum*, which is not a resprouter. Without field work it is not known if *L. crassulaefolium* has any distinctive features other than its growth habit: we have considered it a separate taxon, but more work isneeded.
Records of identification queries = 39.
Records of corrected identification queries = 6.

Variation and Taxonomy: The fact that Robert Brown considered this to be 3 species is testament to its variation. We have excluded non-resprouting forms as *L. crassulifolium*.
Leaf size is variable. First leaves postfire are narrower and somewhat falcate, borne on decumbent stems, with older leaves wider and more succulent.
Flowerheads and fruit vary in size, but other features are not variable.

- Williams notes that there may be a dwarf form on Saronsberg, but material is inadequate.
- Williams mentions that if unburnt for long periods the shrubs might become erect. However, this is not born out in the field, and it may be that this was based on what is now considered to be *L. crassulifolium*.

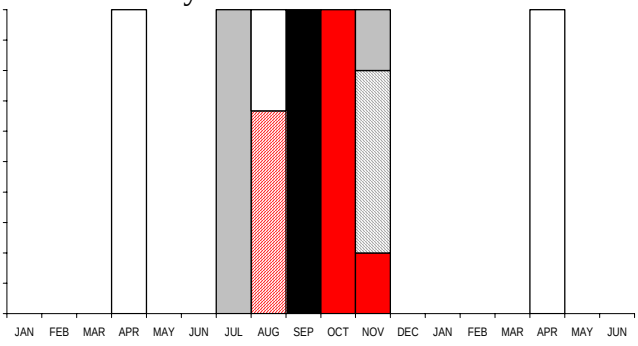
Distribution: Add.
INCLUDEPICTURE
"C:\\temp\\atlas\\LDARCU_m.jpg" *
MERGEFORMAT \d

Leucadendron bonum Williams 1967
Gideonskop Conebush

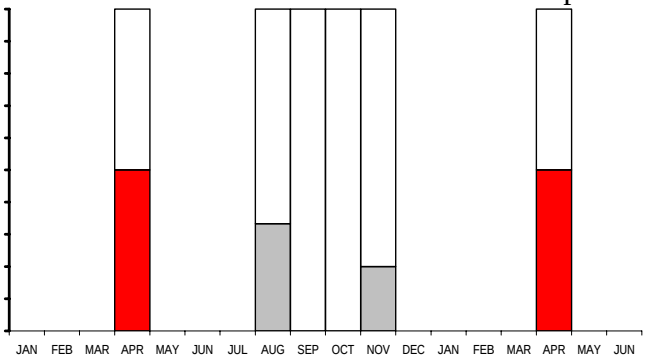
Other Common Names: None known.
Other Scientific Names: *None.*

13 Records

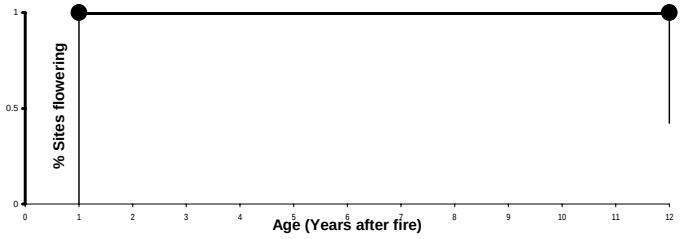
Population (13 records): 54% Frequent, 46% Rare.
Dispersion (12 records): 83% clumped, 8% evenly distributed, 8% variable.
Flowering (13 records with: Jan 0, Feb 0, Mar 0, Apr 2, May 0, Jun 0, Jul 1, Aug 3, Sep 1, Oct 1, Nov 5, Dec 0): Buds from Aug; Flowering from Oct to Nov; Peak Flowering from Sep; Over from Nov; Fruit from Jul and Nov; Nothing from Apr and Aug. Peak levels unreliable at 100% from Sep to Oct. Historically recorded as flowering from Oct, fruit in early Jan and is shed.



Growth (12 records with: Jan 0, Feb 0, Mar 0, Apr 2, May 0, Jun 0, Jul 0, Aug 3, Sep 1, Oct 1, Nov 5, Dec 0): Much from Apr; Rare from Aug and Nov; None from Apr and Aug to Nov. Peak levels unreliable at 50% in Apr.

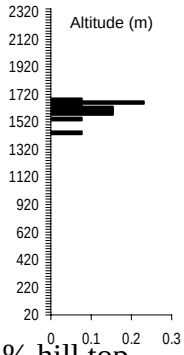


Seedlings (6 records): All without any seedlings present.
Fire Survival (1 record): 100% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 1 year (dubious), and 100% recorded at 12 years, but no data for younger veld.

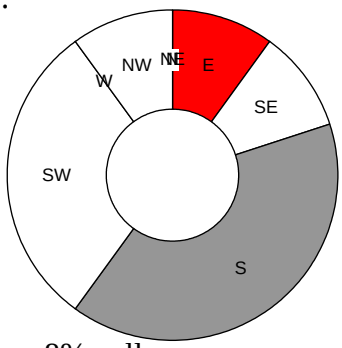


Height (13 records): 85% 0.2-1 m tall, 15% 1-2 m tall.
Pollinators (1 record): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (13 records): 100% inland - further than 2 km from coast.
Altitude (13 records): 1320 - 1580 m; 1460 $_{lq}$ - 1500 $_{med}$ - 1500 $_{uq}$m.



Landform (13 records): 62% deep soil, 31% shallow soil, 8% rocky outcrops.
Slope (13 records): 46% gentle incline, 23% steep incline, 15% hill top, 15% platform.
Aspect (10 records): 60% South, 20% West, 15% East, 5% North.



Soil Type (13 records): 69% sandy, 15% loamy, 8% gravelly, 8% rocky.
Soil Colour (13 records): 92% grey, 8% yellow.
Geology (13 records): 100% sandstone.
Vegetation (13 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered C2a(i)b.
Occurrence (Fynbos): 8 km^2 with 0% conserved and 0% lost; Occupancy: 14 km^2 with 0% conserved and 0% lost. Fragmentation index meaningless.
Nature Reserves (13 records): 0% in Nature Reserves - unconserved.
Habitat destruction (10 records): 80% extensive natural habitat, 20% islands.
Alien Invasive Species (11 records): 100% none.
Alien Density (11 records): 100% alien-free.

Cultivation & Utilization:
Picking (8 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Plants still recognizable by their silvery leaves which in many cases did not burn off: possible inter-fire recruitment of plants judging by the some small (0.6 m) skeletons present- or were these just very stunted adults? (NAHY1072302);
36 live + 2 dead plants seen in this location: no male seen here plants sampled all female (APE93110705); One female (APE93110708); 2 females flowering and 2 females cones 4 flowerheads (LKAY0101404); Population comprised all female plants (NGFY0093002); 54 plants (NGW94111001); Found just s of neck; 3 female plants not sure if others are males (PMRY0042806); 23 alive & 6 dead (WMP98080903);

Confusing Species: None noted.

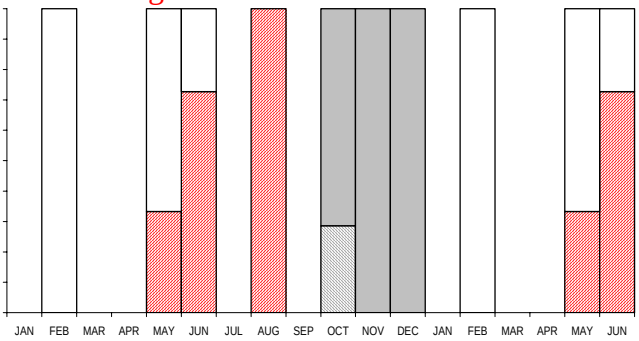
Variation and Taxonomy: No variation noted.

Distribution: Add.
Unusual in that involucral bracts open and close with weather.
INCLUDEPICTURE "C:\\temp\\atlas\\LDBONU_m.jpg" * MERGEFORMAT \d

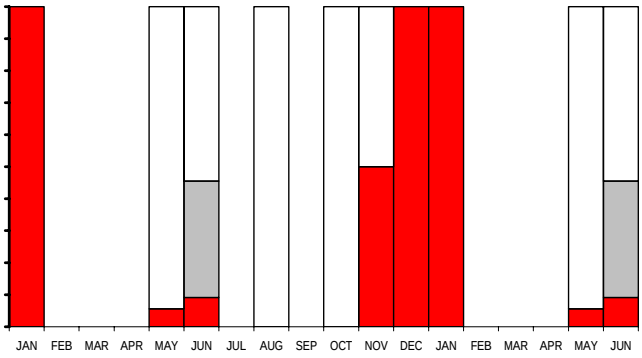
Leucadendron crassulifolium (Salisb. ex Kn.) Williams 1809, 1967
Erect Red-edge Conebush

This name is temporary. The specimen has not been looked at (it does not have a detailed locality). It may merely be a broad-leaf specimen of L. arcuatum.
Other Common Names: None known.
Other Scientific Names: *None.*

42 Records
Population (42 records): 38% Common, 43% Frequent, 19% Rare.
Dispersion (38 records): 63% variable, 37% clumped.
Flowering (40 records with: Jan 0, Feb 1, Mar 0, Apr 0, May 18, Jun 11, Jul 0, Aug 1, Sep 0, Oct 7, Nov 1, Dec 1): Buds from May to Aug; Flowering and Peak Flowering not recorded; Over from Oct; Fruit from Oct to Dec; Nothing from Feb to Jun. Peak levels unreliable. Historically recorded as flowering from check Williams 1967.



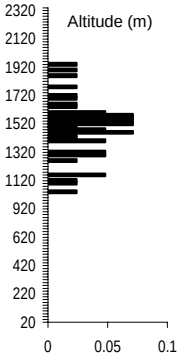
Growth (41 records with: Jan 1, Feb 0, Mar 0, Apr 0, May 18, Jun 11, Jul 0, Aug 1, Sep 0, Oct 7, Nov 2, Dec 1): Much from Nov to Jan; Rare from Jun; None from May to Nov. Peak levels unreliable at 100% from Dec to Jan.



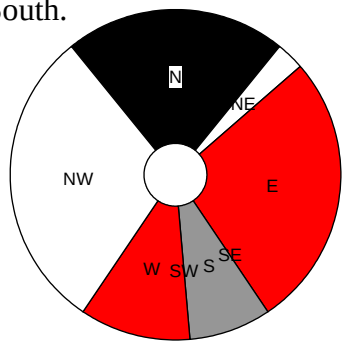
Seedlings (23 records): Absent in 91%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jan.
Fire Survival (17 records): 100% survived by seedlings only.
Age to first flowering: No data.

Height (42 records): 2% 0-0.2 m tall, 38% 0.2-1 m tall, 55% 1-2 m tall, 5% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (42 records): 100% inland - further than 2 km from coast.
Altitude (42 records): 920 - 1840 m; 1280 $_{lq}$ - 1400 $_{med}$ - 1460 $_{uq}$m.



Landform (41 records): 76% shallow soil, 24% deep soil.
Slope (41 records): 54% gentle incline, 29% steep incline, 12% hill top, 5% platform.
Aspect (37 records): 46% North, 28% East, 18% West, 8% South.



Soil Type (41 records): 46% sandy, 39% rocky, 15% loamy.
Soil Colour (41 records): 68% grey, 24% brown, 5% white, 2% yellow.
Geology (40 records): 100% sandstone.
Vegetation (40 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Near Threatened D2(i).
Occurrence (Fynbos): 644 km^2 with 15% conserved and 8% lost; Occupancy: 49 km^2 with 22% conserved and 2% lost. Fragmentation index: 7%.
Nature Reserves (42 records): 19% in Nature Reserves - inadequately conserved.
Habitat destruction (40 records): 100% extensive natural habitat.
Alien Invasive Species (40 records): 93% none, 8% *Pinus*.
Alien Density (40 records): 93% alien-free, 8% sparse.

Cultivation & Utilization:
Picking (37 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
1 escaped 6 killed 6 seedlings 1 possible resprout (AGR95052404); 4 Seedlings 30 escape 3 killed : 1 resprout (agr95052406); 0 resprouting 15 seedlings : 1 killed 1 escape AGR95052407; Single-stemmed bushes (WIJ95123010);
What I am calling *L. crassulaefolium* is a large tree with a thick trunk and therefore single stemmed the large spatulate leaves bigger than those of *L arcuatum* all this gives credence to the belief that this is a separate species (NGF99060502); Particularly large leaves (80 x 40 mm) and an erect habit - resprouting is not obvious although plants were spotted adjacent to cleared strip parallel

to powerlines (SHR93080806);Habit reminiscent of that of *Leucospermum conocarpodendron* (SHR99060601); Leaves spatulate, thick hairy young looking plants: erect HC3 (WMP95010120)
Cape Sugarbird nest with eggs in plant (LYM99060602);

Confusing Species: Only *L. arcuatum* caused a problem with this species: all queries are prior to confirmation of the erect form following queries by Steven Richardson.
Records of identification queries = 8.

Records of corrected identification queries = 3.

Variation and Taxonomy: No variation noted. The following herbarium specimens are of this species: Taylor 6452 (PRE).

Distribution: Add.
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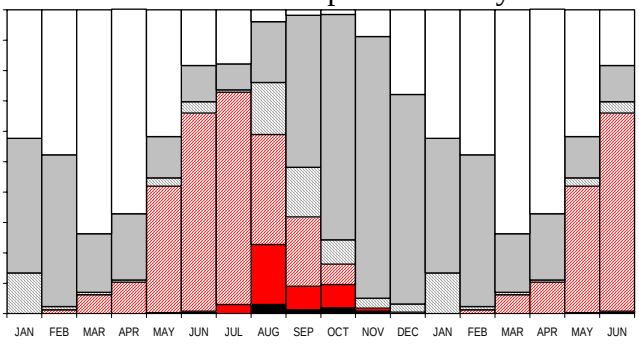
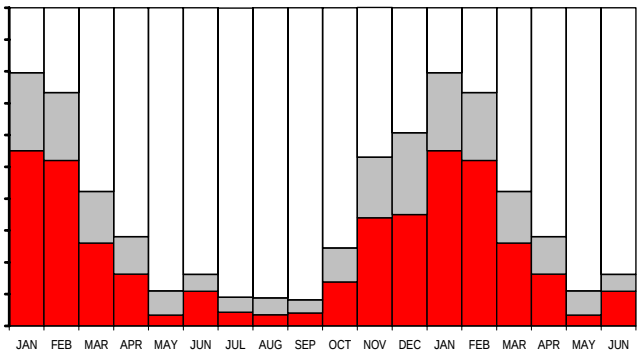
Leucadendron pubescens R.Br. 1810
Grey Conebush
Syhaartolbos

Other Common Names: Emulous Protea, Galpinii, Grey-mat Conebush, Silky Conebush, *Knokkerbos, Knokkers, Knopbos, Pitjiebos, Pitjieknopbos.*
Other Scientific Names: *acutum* Meisn 1856, *aemula* Salisb. ex Knight 1809, *elatum* Buek ex Meisn 1856, *pillansii* Phill. 1917, *retusum* R.Br. 1810, *sericocephalum* Schlechter 1900, *virgata* (Thunb.) 1806.

4065 Records
Population (4047 records): 38% Common, 52% Frequent, 10% Rare.
Dispersion (3874 records): 82% variable, 13% clumped, 4% widespread.
Flowering (3971 records with: Jan 97, Feb 308, Mar 373, Apr 400, May 295, Jun 394, Jul 236, Aug 434, Sep 390, Oct 465, Nov 396, Dec 183): Buds from May to Sep; Flowering from Aug; Peak Flowering and Over not significant; Fruit from Aug to Feb and Apr; Nothing from Dec to May. Peak levels at 76% in Aug. Historically recorded as flowering from July (earlier at lower altitudes) to Oct at high altitudes, fruit ripen 4 months later and drop immediately.

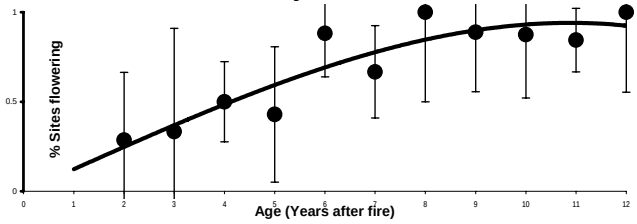


Growth (3921 records with: Jan 98, Feb 300, Mar 371, Apr 399, May 290, Jun 395, Jul 232, Aug 431, Sep 390, Oct 458, Nov 374, Dec 183): Much from Nov to Mar; Rare from Dec to Feb; None from all year round. Peak levels at 80% in Jan.



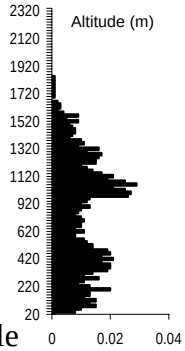
Seedlings (1552 records): Absent in 96%: fewer seedlings than prefire adults in 23 cases, and more in 6 cases. Seedlings found in Jan (15), Feb, Apr (2), May, Jun (3), Jul, Aug, Sep (4), and Nov.

Fire Survival (169 records): 75% survived by seedlings only, 15% escaped fires in fire-safe areas, 8% eliminated from the area by fires, 2% resprouted from underground boles.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 8 years. Slight evidence of senescence after 21 years.

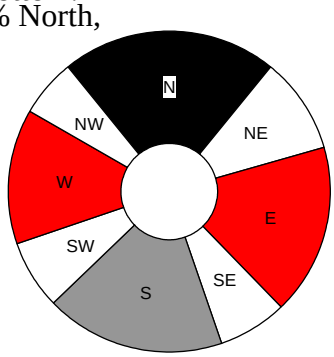


Height (4006 records): 29% 0.2-1 m tall, 66% 1-2 m tall, 5% 2-5 m tall.
Pollinators (25 records): 76% beetles, 16% flies, 4% birds, 4% bees or wasps.
Detailed Pollinators (9 records): Monkey Beetle (5), Green Stripy Beetle (3), Great Protea Beetle.

Habitat:
Distance to Ocean (4045 records): 100% inland - further than 2 km from coast.
Altitude (4047 records): 20 - 1780 m; 360 *lq* - 760 *med* - 1020 *uq*m.



Landform (4022 records): 72% deep soil, 25% shallow soil, 3% rocky outcrops.
Slope (4021 records): 61% gentle incline, 15% platform, 14% steep incline, 8% hill top, 2% valley bottom.
Aspect (3377 records): 29% North, 26% East, 25% South, 20% West.



Soil Type (4005 records): 67% sandy, 14% loamy, 10% gravelly, 9% rocky, 1% clayey.
Soil Colour (3987 records): 38% brown, 23% grey, 13% yellow, 9% orange, 9% white, 7% red.
Geology (3836 records): 82% sandstone, 9% Tertiary sands, 8% shale, 2% silcrete or ferricrete.
Vegetation (4021 records): 99% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 14 507 km^2 with 11% conserved and 19% lost; Occupancy:

3 953 km^2 with 10% conserved and 17% lost. Fragmentation index: 11%.
Nature Reserves (4047 records): 13% in Nature Reserves - inadequately conserved.
Habitat destruction (3987 records): 78% extensive natural habitat, 17% islands, 3% road verges, 1% naturally fragmented habitats, 1% naturally linear habitats.
Alien Invasive Species (3931 records): 78% none, 14% Fabaceae (chiefly alien *Acacia*), 6% *Pinus*, 1% Myrtaceae.
Alien Density (3927 records): 79% alien-free, 18% sparse, 3% abundant.

Cultivation & Utilization:
Picking (2857 records): 100% no sign of picking, 0.4% lightly picked, 0.1% severely picked.
Cultivation Status: No noted cultivation.
Witch's Broom Infestation: 2 records (0.05%).

Atlassers Notes:
Leaf colour variation:
Silver form: 138 records; Grey form: 18 records (including: normal grey form (1), grey (pale green) form (1) and grey-green form (1); Green form: 19 records
Green form lower down and silver form on top (AGR99072403 + 7); Silver form green form below this (AGR99072413 + 15); Plants differ from populations to north and south as follows: (1) Silvery leaves (2) Indistinct involucral leaves (3) Later flowering (SHR95100801); Silver form completely different from the big green shrubs that are common in the more arid areas (VJKY0092303);
Juveniles silver till flowering then turning grey (AGRY2040502); Female smooth green leaves, male hairy (MHR98031002); Attractive silver-leaf form (SMRY0072102);
Leaf size variation:
Big leaf form (IEB99042504); Large leaf form (NGF99042504); Broad leaf form (NGF99042506); The plants look very different from that found on the west coast: leaves longer greener straighter & less hairy (PVR95061801); Widely distributed along roadside large female leaves 50x12 mm male leaves 18x3 mm (WIJ92071807); Large and small leaf varieties – esp. latter (WIJ99090302); Small-leaf variety (WIJ99090306);
With big green leaves in female (RGJ97011801 + 3); Large female leaves 50x12 mm, male leaves 18x3 mm (WIJ92071807);
Other notes on variation:
Cone very hairless! (AGR99032602); Found one plant that had the growth habit of *Protea sulplurea* –i.e. hanging over the rocks (DOA94012712);
Confusing species:
Only females definite – males confusable with other species (MHR92081502);Grey form: veld young and *L. pubescens* and *glaberrimum subsp. glaberrimum* required special attention to separate (AGRY2040501); *L. pubescens* and *glaberrimum subsp. eruberscens* numbers from skeletons – differences in young too subtle (AGRY3112510);
Phenology:
With growth and developing next flowers (AWA95061603); Females: old cones only, males: in bud (HCE96070401); Males in new growth whereas females are not (PMR98120601); Males in early bud but females show nothing yet (SMRY0062205); The male buds appear to be sterile dry - may be earlier in year drought (VJK95061605); Some seeds in cones though most are empty (WIJY0050804);
Fire survival:
Interfire recruitment (AGR96091133 + 34); Some plants so old and stressed: no flowers or new growth (AWA96082001); Some resprouted (WIJ92011202); One plant resprouting from ground after damage (WIJ94041002);
Habitat:
Spreading into old lands (AGR99051512); Includes old fields at base with good recolonization (AGRY1042705);
Much taller and more prolific at base of sandstone adjacent shale band - however no differences in abundance and no plants on shale proper so separate plot not done (AGRY0031824); In riverine area: growing like one of the Stream Conebushes in dense riverine patches (AGRY0102806); On the boundary between shale and sandstone (DJL99102707);
Grazing and damage:
A few plants heavily grazed! (APE94081711); Plants removed from veld: used to make kraal (AGR92082402); Bush cut (GEKY2110601);
Deaths:
Lots of dead plants - about 1/2 of population (AGR95081109); Bush half dead (AGR99072403); Skeleton very recently dead (AGRY0062230); 1 In 7 Plants Dead (AGRY1020604); In places most plants dead (this fire cycle) or dying - drought? (AGRY1020616); Some dead, lots have lost last years leaves and look sick - previous years leaves OK - this years leaves at tips of bare branches (AGRY1020714); 2 dead plants only (AMMY0111501); A lot of plants are dead or dying (AMMY0112306); One very old bush big part of it died off (AWA95061601); Many dying plants (CFRY0072101); Large but not very healthy plants (CHE99102701); Dead (SAS98080809); Experiencing water stress (SHRY0070901); 100s of dead plants (WIJ99042507);
Population dynamics:
All female (AGR94101001, AGR97051818); 23 plants (AGR98080908); 6 males and 2 females (AGRY0012929); Less than 1/3 of the previous generation (AGRY0112323); Austen counted 75 plants - is a sucker for counting proteas! (AWA95061603); There were 4 females + 2 males (HCE96070401); Mainly males present on plot (HCE96070601);
Pollinators:
Saw butterfly and worm (IVM98082702); Butterflies landing on bushes where buds are opened – 30 mm brown/black with blue spots on wings, flies on bushes, large caterpillars on 1 bush - lots - obliterating bush! (VCH98082702); Beetles - 2 types: 1- hairy black 9x4 mm, 2- green 10x4 mm (WIJ95082409);

Confusing Species: Confused with *L. barkerae* (which has different – hairless cones and similar sexes), *L dregei* (which has a different growth habit), and sporadically with other species during the juvenile phases. Expected problems with *L. loranthifolium*

(with hairless cones) and *L. rubrum* (male plants similar) did not materialize perhaps because females were correctly sought after for identification.

Records of identification queries = 243.
Records of corrected identification queries = 27.

Variation and Taxonomy: Williams states that this is a very variable species: he would have liked to have divided it into about 5 subspecies, but could not find enough geographical criteria to do so. The following forms were singled out by him:

- Very small leaves: at Lokenberg, Botterkloof and Tigerberg;
- Extremely large leaves, especially in the male: Karoopoort;
- Very acute leaves: Touwsberg.
- Dwarf form with silver leaves: Tafelberg: Cedarberg.

Salisbury's *Protea aemula* 1809 predates Robert Browns *Leucadendron aemulum* 1810 for *L. comosum*. Thunberg's *Protea virgata 1806* predates Browns *Leucadendron virgatum* 1810 for *L. salignum*. So why is it not *Leucadendron virgatum*?

Distribution: Add.
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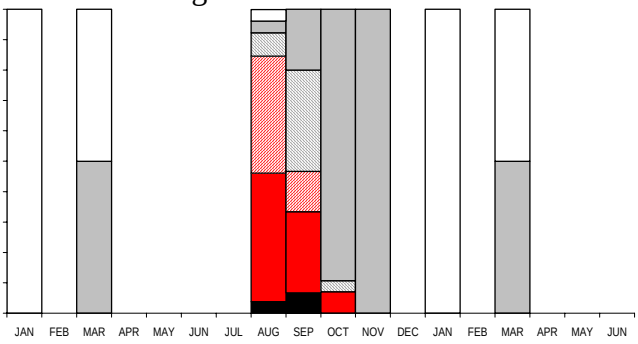
Leucadendron remotum Williams 1969
Nieuwoudtville Conebush

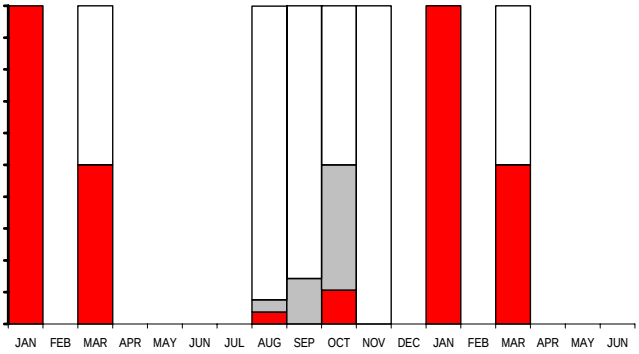
Other Common Names: Bokkeveld Conebush.
Other Scientific Names: *None.*

74 Records

Population (74 records): 20% Common, 49% Frequent, 31% Rare.
Dispersion (60 records): 72% variable, 27% clumped, 2% evenly distributed.
Flowering (73 records with: Jan 1, Feb 0, Mar 2, Apr 0, May 0, Jun 0, Jul 0, Aug 26, Sep 15, Oct 28, Nov 1, Dec 0): Buds from Aug; Flowering from Aug to Sep; Peak Flowering not significant; Over from Sep; Fruit from Mar and Sep to Nov; Nothing from Jan to Mar. Peak levels unreliable at 92% in Aug. Historically recorded as flowering from late Aug to early Sep, fruits ripen in Nov and soon fall to ground.



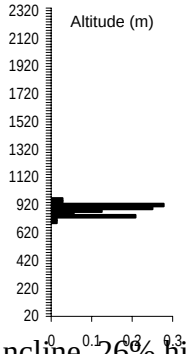
Growth (72 records with: Jan 1, Feb 0, Mar 2, Apr 0, May 0, Jun 0, Jul 0, Aug 26, Sep 14, Oct 28, Nov 1, Dec 0): Much from Jan to Mar; Rare from Oct; None from Mar to Nov. Peak levels unreliable at 100% in Jan.



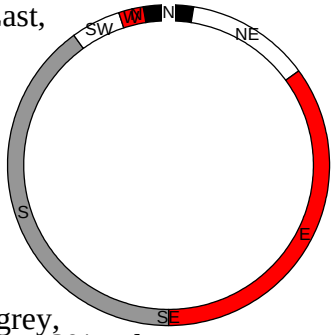
Seedlings (32 records): All without any seedlings present.
Fire Survival : No data.
Age to first flowering:. First flowers recorded at 100% at 5 years.

Height (73 records): 8% 0.2-1 m tall, 89% 1-2 m tall, 3% 2-5 m tall.
Pollinators (8 records): 63% beetles, 25% bees or wasps, 13% flies.
Detailed Pollinators (4 records): Monkey Beetle.

Habitat:
Distance to Ocean (72 records): 100% inland - further than 2 km from coast.
Altitude (72 records): 680 - 860 m; 740 $_{lq}$ - 800 $_{med}$ - 800 $_{uq}$m.



Landform (72 records): 89% deep soil, 8% shallow soil, 1% swamp, 1% rocky outcrops.
Slope (72 records): 46% gentle incline, 26% hill top, 26% platform, 1% valley bottom.
Aspect (40 records): 43% South, 41% East, 11% North, 5% West.



Soil Type (71 records): 85% sandy, 15% loamy.
Soil Colour (71 records): 41% brown, 23% yellow, 20% grey, 8% orange, 6% white, 3% red.
Geology (72 records): 99% sandstone, 1% shale.
Vegetation (71 records): 97% shrubland, 1% wooded grassland, 1% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Endangered A3c, B1a(ii)b(i,ii,iii,iv,v) + 2a(ii)b(i,ii,iii,iv,v).
Occurrence (Fynbos): 183 km^2 with 0% conserved and 19% lost; Occupancy: 97 km^2 with 0% conserved and 29% lost. Fragmentation index: 42%.
Nature Reserves (72 records): 0% in Nature Reserves - unconserved.
Habitat destruction (71 records): 66% extensive natural habitat, 27% islands, 6% road verges, 1% naturally fragmented habitats.
Alien Invasive Species (67 records): 64% none, 15% Fabaceae (chiefly alien *Acacia*), 12% *Pinus*, 7% other aliens, 1% Myrtaceae.
Alien Density (67 records): 64% alien-free, 31% sparse, 4% abundant.

Cultivation & Utilization:
Picking (50 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
With a variety of smaller bushes - not all the same age (AGR92082510);

Saw plants only next to road (AWA95090103);
Two different types of Monkey Beetles : black and iridescent-blue (AGR92082508);

Confusing Species: Easily confused with *L. pubescens* by inattentive atlassers, but has squarer leaves and less sexual dimorphism.
Records of identification queries = 14.
Records of corrected identification queries = 11.

Variation and Taxonomy: No variation noted.

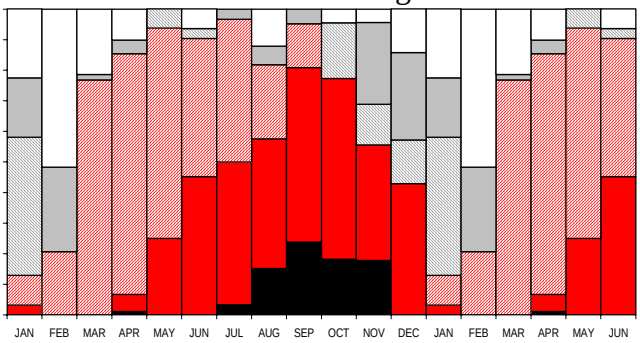
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDREMO_m.jpg" * MERGEFORMAT \d

Leucadendron nitidum Buek ex Meisn. 1856
Bokkeveld Conebush
Perdepisbos

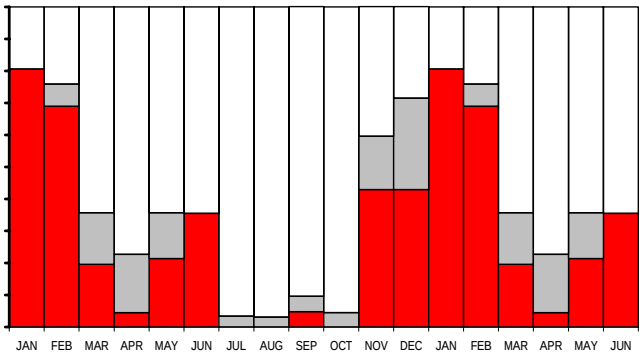
Other Common Names: *Perdepistolbos.*
Other Scientific Names: *schinzianum* Schltr. 1900, *schlechteri* Phill & Hutch 1912.

418 Records

Population (413 records): 25% Common, 57% Frequent, 17% Rare.
Dispersion (375 records): 67% variable, 30% clumped, 3% widespread.
Flowering (410 records with: Jan 31, Feb 29, Mar 56, Apr 89, May 16, Jun 31, Jul 30, Aug 33, Sep 21, Oct 22, Nov 45, Dec 7): Buds from Feb to Aug; Flowering from May to Dec; Peak Flowering from Sep; Over from Jan; Fruit from Nov to Feb; Nothing from Jan to Mar. Peak levels at 96% in Oct. Historically recorded as flowering from Jul to Nov and even earlier, fruit ripen after 3 months and soon fall to the ground.



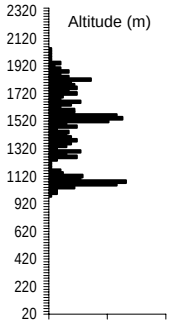
Growth (402 records with: Jan 31, Feb 29, Mar 56, Apr 88, May 14, Jun 31, Jul 29, Aug 32, Sep 21, Oct 22, Nov 42, Dec 7): Much from Nov to Mar and May to Jun 35; Rare from Dec; None from Feb to Dec. Peak levels at 81% in Jan.



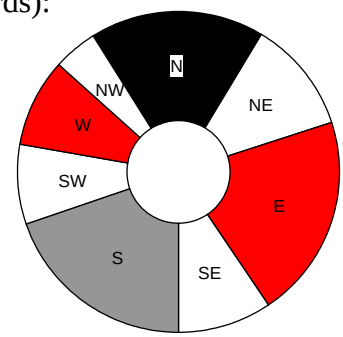
Seedlings (146 records): Absent in 99%: more seedlings than prefire adults in 1 case. Seedlings found in Jan.
Fire Survival (15 records): 53% survived by seedlings only, 27% eliminated from the area by fires, 13% resprouted from underground boles, 7% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% estimated at 5 years.

Height (410 records): 10% 0-0.2 m tall, 70% 0.2-1 m tall, 19% 1-2 m tall.
Pollinators (2 records): 50% bees or wasps, 50% beetles.
Detailed Pollinators (1 record): Monkey Beetle.

Habitat:
Distance to Ocean (412 records): 100% inland - further than 2 km from coast.
Altitude (412 records): 860 - 1940 m; 1120 *lq* - 1420 *med* - 1500 *uq*m.



Landform (404 records): 66% deep soil, 31% shallow soil, 3% rocky outcrops.
Slope (404 records): 58% gentle incline, 16% platform, 15% steep incline, 7% hill top, 4% valley bottom.
Aspect (342 records): 32% East, 29% South, 25% North, 15% West.



Soil Type (406 records): 59% sandy, 15% gravelly, 13% rocky, 12% loamy, 1% clayey.
Soil Colour (402 records): 44% grey, 27% brown, 12% yellow, 10% white, 4% orange, 2% red.
Geology (394 records): 84% sandstone, 14% shale, 1% Tertiary sands.
Vegetation (404 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 2 812 km^2 with 7% conserved and 8% lost; Occupancy: 539 km^2 with 14% conserved and 2% lost. Fragmentation index: 15%.
Nature Reserves (412 records): 22% in Nature Reserves.
Habitat destruction (399 records): 91% extensive natural habitat, 6% islands, 2% naturally linear habitats.
Alien Invasive Species (393 records): 86% none, 13% *Pinus*.

Alien Density (392 records): 86% alien-free, 10% sparse, 3% abundant.

Cultivation & Utilization:
Picking (225 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Very small leaved form (like *L. sericeum*) but occasional plants form upright growth and much larger leaves - so not typical of *sericeum* (AGRY0042711); Dwarf form flat on ground small leaves (AGRY0042713); With dwarf prostrate habit and very small leaves with a few normal erect stems (AGRY0042818); Growth form erect (JAT93050101 + 3); Is a little smaller than normal though but not *L. sericeum* as suspected (WMP98080803);
Silver Leaves (VCH99072408 + 10);
The big involucral leaves occur only with older cones and those which have opened and released seed. Much foliage from low down on plants several branches over 1m long with relatively little foliage and terminal cones (WIJ94111608);
In bud, even though some seeds just dropped-two flowerings in this year (AGR99032831); Appears to be flowering for the second time this season (AGRY0112307); Only stunted plants here blooming everywhere else (AWA96082507);
Orange Breasted Sunbirds visiting plants - presumably gleaning insects - flowers not yet open so not pollinators (AGR99032802);
Lots of galls (AGR99032817);
Experiencing water stress (SHRY0070901);

Confusing Species: Apart from a few transcription errors, rarely mistaken for anything else other than when not in flower for *L.dubium* and male *L. pubescens*.
Records of identification queries = 27
Records of corrected identification queries = 5.

Variation and Taxonomy: The leaf and flower sizes vary somewhat. The size of the involucral leaves is also extremely variable: large forms occur at Ezelbank and small forms at Hansiesberg, Gydoberg and Baviaansberg (i.e. the southernmost populations). The southern-most populations are also more decumbent, being low spreading plants.

Distribution: Add.
INCLUDEPICTURE
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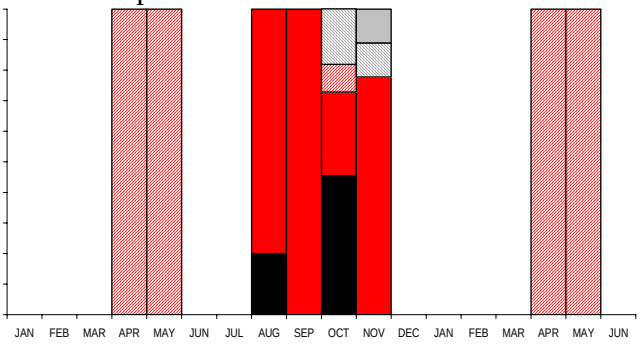
MERGEFORMAT \d

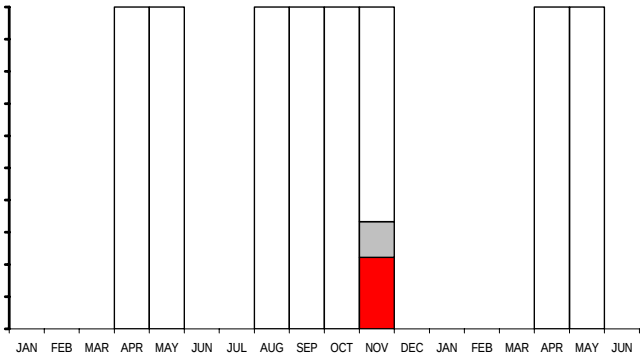
Leucadendron sericeum (Thunb.) R.Br. 1781, 1810
Waaboom's Conebush

Other Common Names: Silky Gissonia, *Perdebos.*
Other Scientific Names: *None.*

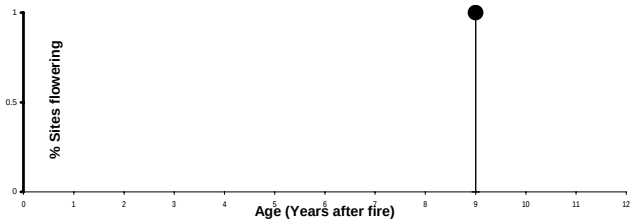
31 Records
Population (31 records): 58% Common, 35% Frequent, 6% Rare.
Dispersion (30 records): 63% variable, 37% clumped.
Flowering (31 records with: Jan 0, Feb 0, Mar 0, Apr 2, May 1, Jun 0, Jul 0, Aug 5, Sep 3, Oct 11, Nov 9, Dec 0): Buds from Apr to May; Flowering from Aug to Nov; Peak Flowering from Aug and Oct; Over from Oct; Fruit not significant from Nov; Nothing not recorded. Peak levels at 100% from Aug to Oct. Historically recorded as flowering from May to Sep, fruits ripen after 4 months and drop.



Growth (31 records with: Jan 0, Feb 0, Mar 0, Apr 2, May 1, Jun 0, Jul 0, Aug 5, Sep 3, Oct 11, Nov 9, Dec 0): Much from Nov; Rare not significant from Nov; None from all year Apr to Nov. Peak levels unreliable at 33% in Nov.

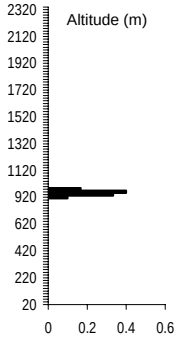


Seedlings (11 records): All without any seedlings present.
Fire Survival : No data.
Age to first flowering: First flowers recorded at 100% at 9 years, no data from younger veld.

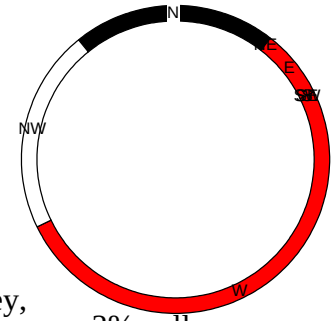


Height (31 records): 6% 0-0.2 m tall, 94% 0.2-1 m tall.
Pollinators (1 record): 100% beetles.
Detailed Pollinators (1 record): Monkey Beetle.

Habitat:
Distance to Ocean (30 records): 100% inland - further than 2 km from coast.
Altitude (30 records): 800 - 880 m; 820 *lq* - 840 *med* - 840 *uq*m.



Landform (30 records): 100% deep soil.
Slope (30 records): 53% platform, 30% valley bottom, 17% gentle incline.
Aspect (14 records): 61% West, 32% North, 7% East.



Soil Type (30 records): 67% sandy, 30% loamy, 3% gravelly.
Soil Colour (30 records): 50% grey, 30% white, 17% brown, 3% yellow.
Geology (30 records): 87% sandstone, 7% shale, 7% Tertiary sands.
Vegetation (30 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered B1b(i,ii,iii,iv,v)c(iv).
Occurrence (Fynbos): 36 km^2 with 0% conserved and 33% lost; Occupancy: 20 km^2 with 0% conserved and 23% lost. Fragmentation index: 56%.
Nature Reserves (30 records): 0% in Nature Reserves - unconserved.
Habitat destruction (29 records): 90% extensive natural habitat, 10% islands.
Alien Invasive Species (30 records): 87% none, 13% *Pinus*.
Alien Density (30 records): 87% alien-free, 13% sparse.

Cultivation & Utilization:
Picking (25 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Plant Was (NAH94040403);

46 plants on a minute piece of mainly disturbed land where the farmer turned his plough! (AWA99100303);
1 plant in this area less than 1 m away from an onion field, female: leaves 8-9 mm long by 2 mm wide, densely covered with adpressed grey hairs, involucral leaves 13 X 2 mm (NAH94040403);
Confined to road verge (GEDY0112303);

Confusing Species: A small form of *L. nitidum*, much smaller than typical of that species. It has the smallest leaves in the genus.
Records of identification queries = 4.

Variation and Taxonomy: No variation noted.

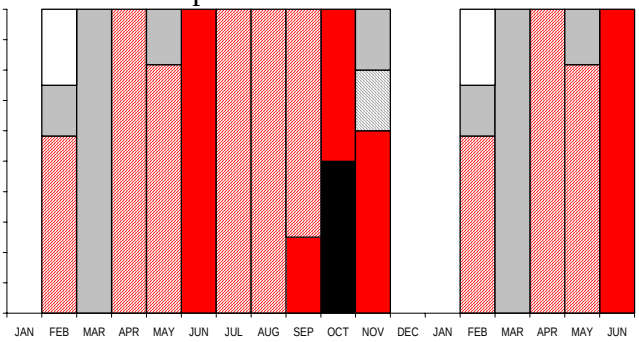
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSERI_m.jpg" * MERGEFORMAT \d

Leucadendron singulare Williams
Kammanassie Conebush

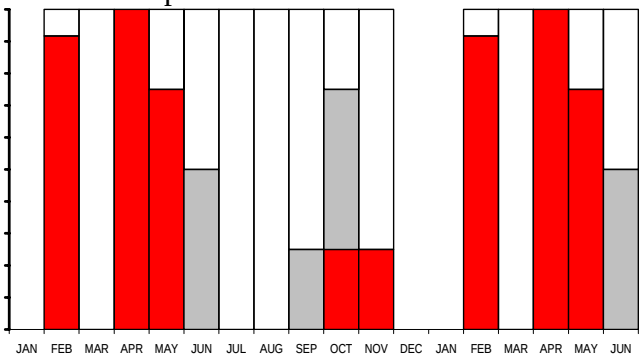
Other Common Names: None known.
Other Scientific Names: *None.*

49 Records

Population (49 records): 14% Common, 47% Frequent, 39% Rare.
Dispersion (43 records): 44% clumped, 40% variable, 14% evenly distributed, 2% widespread.
Flowering (47 records with: Jan 0, Feb 12, Mar 1, Apr 1, May 11, Jun 1, Jul 2, Aug 6, Sep 4, Oct 4, Nov 5, Dec 0): Buds from Feb to Sep; Flowering from Sep to Nov; Peak Flowering from Oct; Over from Nov; Fruit from Mar and Nov; Nothing from Feb. Peak levels unreliable at 100% in Oct. Historically recorded as flowering from Oct, fruit ripen in Feb and drop.



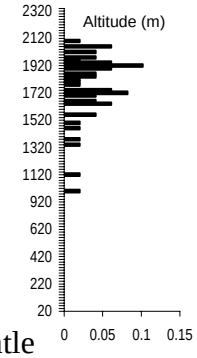
Growth (47 records with: Jan 0, Feb 12, Mar 1, Apr 1, May 12, Jun 2, Jul 2, Aug 5, Sep 4, Oct 4, Nov 4, Dec 0): Much from Oct to May; Rare from Jun and Sep to Oct; None from May to Nov. Peak levels unreliable at 92% in Apr.



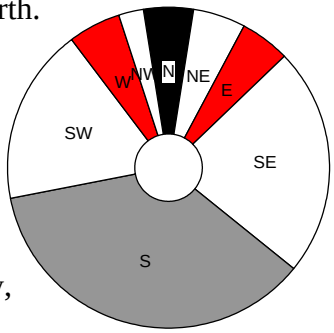
Seedlings (24 records): Absent in 92%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jun.
Fire Survival (1 record): 100% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 100% at 3 years.

Height (49 records): 24% 0-0.2 m tall, 73% 0.2-1 m tall, 2% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (49 records): 100% inland - further than 2 km from coast.
Altitude (49 records): 880 - 2000 m; 1540 $_{lq}$ - 1680 $_{med}$ - 1820 $_{uq}$m.



Landform (48 records): 50% shallow soil, 25% rocky outcrops, 25% deep soil.
Slope (49 records): 61% steep incline, 16% hill top, 14% gentle incline, 8% cliff.
Aspect (39 records): 58% South, 18% East, 15% West, 9% North.



Soil Type (49 records): 41% sandy, 20% rocky, 16% loamy, 12% peaty, 10% gravelly.
Soil Colour (47 records): 68% grey, 26% black, 6% brown.
Geology (45 records): 98% sandstone, 2% shale.
Vegetation (49 records): 98% shrubland, 2% grassland.

Conservation Status and Threat:
Red Data List Status: Vulnerable A3c, D2(ii).
Occurrence (Fynbos): 149 km^2 with 74% conserved and 0% lost; Occupancy: 63 km^2 with 58% conserved and 0% lost. Fragmentation index: 40%.
Nature Reserves (49 records): 73% in Nature Reserves - well conserved.
Habitat destruction (47 records): 89% extensive natural habitat, 6% islands, 2% naturally linear habitats, 2% naturally fragmented habitats.
Alien Invasive Species (48 records): 98% none, 2% *Pinus*.
Alien Density (48 records): 98% alien-free, 2% sparse.

Cultivation & Utilization:
Picking (32 records): 100% no sign of picking.

Cultivation Status: No noted cultivation.

Atlassers Notes:
7 male and 5 female plants (JBB98043006);

Confusing Species: Single instances of confusion with *L. dregei* and *L. sorocephalodes,* both of which have hairless leaves. The male does resemble a dwarf *L. album*, but the female is quite different.
Records of identification queries = 5.

Records of corrected identification queries = 2.

Variation and Taxonomy: No variation noted.

Distribution: Add.
INCLUDEPICTURE
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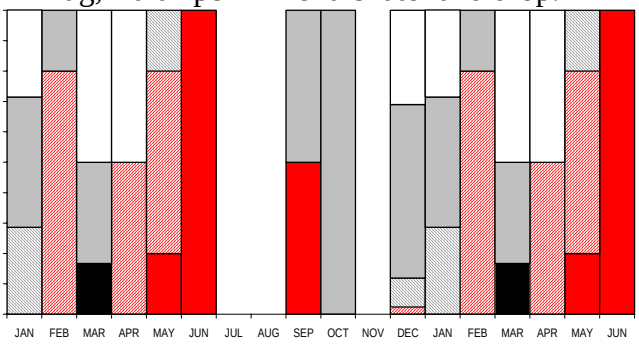
MERGEFORMAT \d

Leucadendron sorocephalodes Phill. & Hutch. 1912
Woolly Conebush

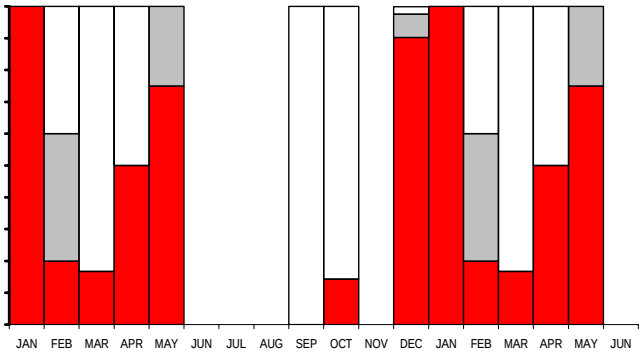
Other Common Names: Kouga Conebush.
Other Scientific Names: *dregei (*Buek ex Meisn.) 1856, *intermedius* (Buek in Drege) 1844.

93 Records

Population (92 records): 41% Common, 40% Frequent, 17% Rare, 1% Extinct.
Dispersion (84 records): 74% variable, 23% clumped, 2% widespread, 1% evenly distributed.
Flowering (92 records with: Jan 7, Feb 5, Mar 6, Apr 2, May 5, Jun 2, Jul 0, Aug 0, Sep 2, Oct 21, Nov 0, Dec 42): Buds from Feb and Apr to May; Flowering from May to Sep; Peak Flowering not significant; Over from Jan and May; Fruit from Sep to Mar; Nothing from Dec to Jan and Mar to Apr. Peak levels unreliable at 100% from May to Jun. Historically recorded as flowering in Aug, fruit ripen 4 months later and drop.



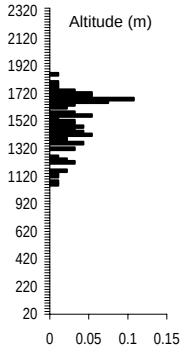
Growth (88 records with: Jan 7, Feb 5, Mar 6, Apr 2, May 4, Jun 0, Jul 0, Aug 0, Sep 2, Oct 21, Nov 0, Dec 41): Much from Dec to Feb and Apr to May; Rare from Feb and May; None from Feb to Apr and Sep to Oct. Peak levels unreliable at 100% in Jan.



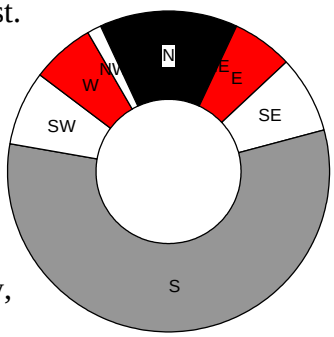
Seedlings (30 records): Absent in 93%: fewer seedlings than prefire adults in 1 case. Seedlings found in Dec.
Fire Survival (5 records): 80% survived by seedlings only, 20% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 4 years, 50% estimated at 3 years, and 100% recorded at 4 years.

Height (91 records): 38% 0-0.2 m tall, 60% 0.2-1 m tall, 1% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (93 records): 100% inland - further than 2 km from coast.
Altitude (93 records): 940 - 1760 m; 1300 $_{lq}$ - 1400 $_{med}$ - 1560 $_{uq}$m.



Landform (90 records): 74% shallow soil, 24% deep soil, 1% rocky outcrops.
Slope (90 records): 47% steep incline, 32% hill top, 21% gentle incline.
Aspect (65 records): 66% South, 15% North, 12% West, 7% East.



Soil Type (90 records): 52% loamy, 32% sandy, 11% rocky, 3% peaty, 1% gravelly.
Soil Colour (91 records): 67% grey, 19% brown, 14% black.
Geology (92 records): 100% sandstone.
Vegetation (91 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Near Threatened A2a.
Occurrence (Fynbos): 1 281 km^2 with 45% conserved and 2% lost; Occupancy: 120 km^2 with 39% conserved and 1% lost. Fragmentation index: 8%.
Nature Reserves (93 records): 17% in Nature Reserves - inadequately conserved.
Habitat destruction (88 records): 94% extensive natural habitat, 3% naturally fragmented habitats, 2% naturally linear habitats.
Alien Invasive Species (86 records): 78% none, 20% *Pinus*, 2% *Hakea*.
Alien Density (86 records): 78% alien-free, 22% sparse.

Cultivation & Utilization:
Picking (38 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Some old plants about 300 mm high (SGAY0121506);

Confusing Species: None noted.
Records of identification queries = 4.

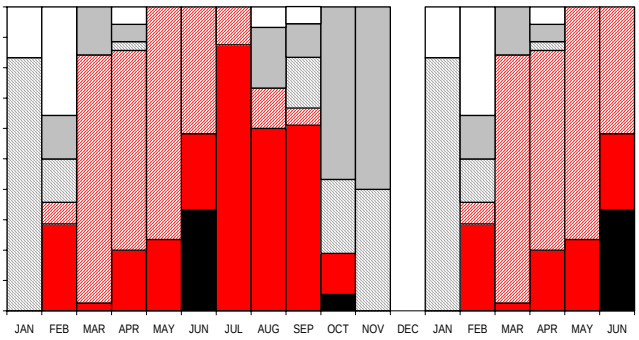
Variation and Taxonomy: No variation noted.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSORO_m.jpg" * MERGEFORMAT \d

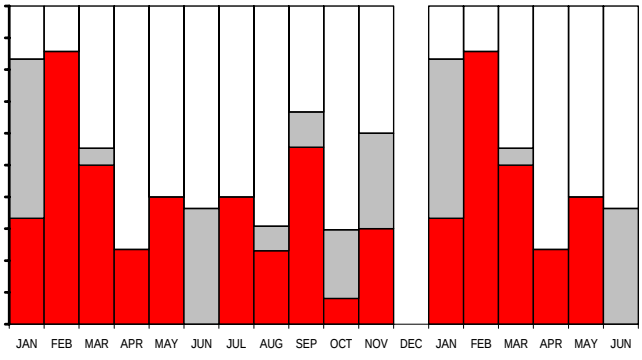
Leucadendron ericifolium R.Br. 1810
Erica-leaf Yellowbush
Heideblaargeelbos

Other Common Names: Beckside Gissonia, Ericaleaf Conebush, Ericoid Conebush.
Other Scientific Names: *angustatum* R.Br. 1810, *riparia* (Salisb. ex Knight) 1809, *uniflorum* Phill 1920.

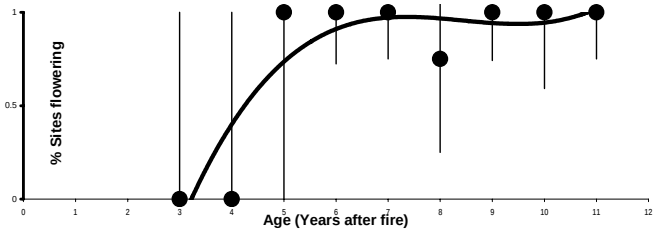
222 Records
Population (221 records): 1% Abundant, 42% Common, 49% Frequent, 7% Rare.
Dispersion (214 records): 47% variable, 41% clumped, 8% evenly distributed, 3% widespread.
Flowering (220 records with: Jan 6, Feb 14, Mar 38, Apr 35, May 17, Jun 12, Jul 8, Aug 15, Sep 18, Oct 37, Nov 20, Dec 0): Buds from Mar to Jun; Flowering from Feb and Apr to Sep; Peak Flowering from Jun; Over from Oct to Jan; Fruit from Aug and Oct to Nov; Nothing from Feb. Peak levels at 100% in Jul. Historically recorded as flowering in July, fruit ripen in Nov and are then shed.



Growth (211 records with: Jan 6, Feb 14, Mar 38, Apr 34, May 15, Jun 11, Jul 5, Aug 13, Sep 18, Oct 37, Nov 20, Dec 0): Much from Nov to May and Jul to Sep; Rare from Oct to Jan and Jun; None from Mar to Nov. Peak levels at 86% in Feb.

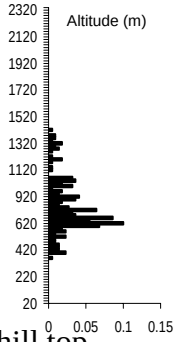


Seedlings (63 records): Absent in 97%: more seedlings than prefire adults in 1 case. Seedlings found in Aug .
Fire Survival (9 records): 56% survived by seedlings only, 33% eliminated from the area by fires, 11% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 5 years, 50% estimated at 4-5 years, and 100% recorded at 5 years.

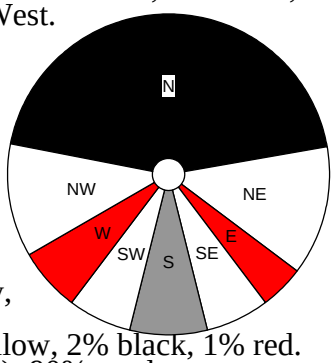


Height (221 records): 1% 0-0.2 m tall, 6% 0.2-1 m tall, 73% 1-2 m tall, 19% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (220 records): 100% inland - further than 2 km from coast.
Altitude (220 records): 340 - 1320 m; 600 $_{lq}$ - 660 $_{med}$ - 720 $_{uq}$m.



Landform (220 records): 65% deep soil, 30% shallow soil, 5% rocky outcrops.
Slope (220 records): 50% gentle incline, 41% steep incline, 6% hill top.
Aspect (204 records): 59% North, 14% East, 14% South, 13% West.



Soil Type (218 records): 64% sandy, 17% loamy, 12% gravelly, 4% rocky, 2% clayey.
Soil Colour (220 records): 51% grey, 35% brown, 5% orange, 5% yellow, 2% black, 1% red.
Geology (220 records): 90% sandstone, 9% shale.
Vegetation (220 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 1 423 km^2 with 38% conserved and 5% lost; Occupancy: 217 km^2 with 48% conserved and 5% lost. Fragmentation index: 7%.
Nature Reserves (220 records): 65% in Nature Reserves - well conserved.
Habitat destruction (216 records): 100% extensive natural habitat.
Alien Invasive Species (219 records): 53% none, 41% *Hakea*, 4% *Pinus*, 3% Fabaceae (chiefly alien *Acacia*).
Alien Density (218 records): 53% alien-free, 45% sparse, 2% abundant.

Cultivation & Utilization:
Picking (171 records): 100% no sign of picking.

Cultivation Status: No noted cultivation.

Atlassers Notes:
Can be HC4 – greater than 3 m (AWA96111203, AWA99032603); Why is it so tall 2-5m when *Protea lorifolia* is only having its second lot of flowers - what gives them an early start? (VJK95032603); Appears to recover remarkably well and quickly after fire - I wonder why? (VJK98062707);
My lonely hearts protea - only one lone male (AWA96110501); Was surprised to find it in four sites so did a count: about 60, 50, 40 and 14 with maximum total of 200 plants (VJK98062707); A nice dense stand of 8-10 ha (DOA93073108); About 20 plants (DOA93090109); Area covered by plants is 170 x 100 m - according to our conservation officer this is an endangered species - looks great to us in spite of fire 6 years ago (DOA93090109); We were surprised and delighted to find this big stand - it is twice the size and number as at Brose Grove across the Tradouw River - also has the same companions but in a much bigger populations (VJK95031002);

Confusing Species: None noted: very distinct.

Variation and Taxonomy: Robert Brown described the males as *L. ericifolium* and the females as *L. angustatum*.
Why is *riparia* 1809 not the correct name? non *L. riparia* Salter 1943.

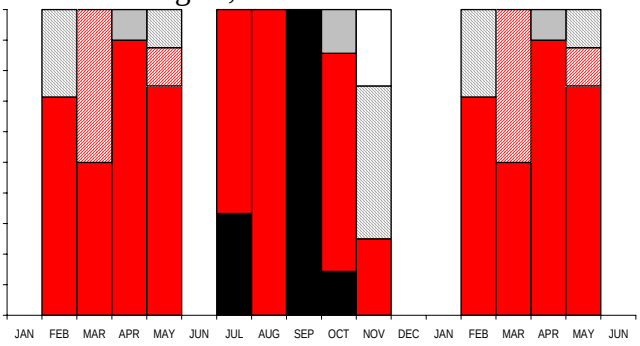
Distribution: Add.
Storey about extinct and on herbicide labels.
INCLUDEPICTURE "C:\\temp\\atlas\\LDERIC_m.jpg" * MERGEFORMAT \d

Leucadendron olens Williams 1981
Fragrant Conebush

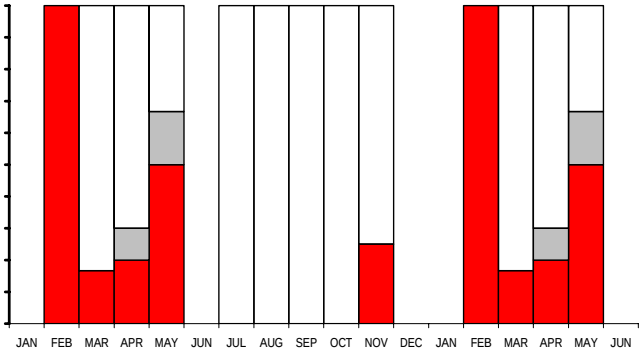
Other Common Names: Yellow Conebush.
Other Scientific Names: *None.*

57 Records

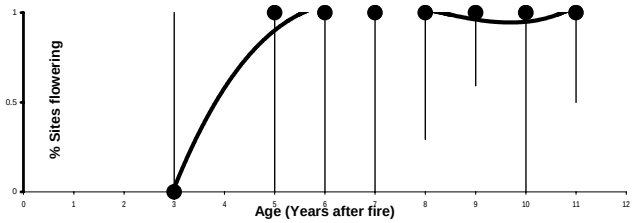
Population (57 records): 32% Common, 61% Frequent, 7% Rare.
Dispersion (55 records): 53% variable, 38% clumped, 5% widespread, 4% evenly distributed.
Flowering (56 records with: Jan 0, Feb 7, Mar 6, Apr 10, May 8, Jun 0, Jul 3, Aug 9, Sep 2, Oct 7, Nov 4, Dec 0): Buds from Mar; Flowering from Feb to Nov; Peak Flowering from Jul and Sep; Over from Feb and Nov; Fruit not significant; Nothing from Nov. Peak levels at 100% from Jul to Sep. Historically recorded as flowering from June, fruit in August, shed.



Growth (51 records with: Jan 0, Feb 7, Mar 6, Apr 10, May 6, Jun 0, Jul 3, Aug 6, Sep 2, Oct 7, Nov 4, Dec 0): Much from Nov to Feb and Apr to May; Rare from May; None from Mar to Nov. Peak levels unreliable at 100% in Feb.

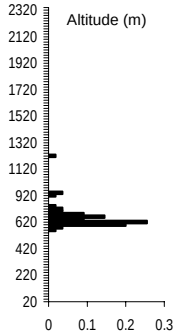


Seedlings (18 records): All without any seedlings present.
Fire Survival (3 records): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 5 years, 50% estimated at 4 years, and 100% recorded at 5 years.

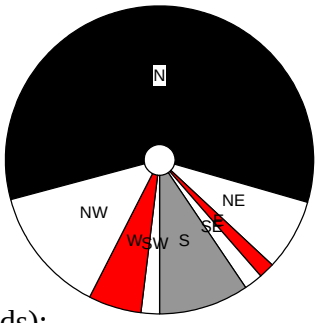


Height (57 records): 2% 0-0.2 m tall, 67% 0.2-1 m tall, 26% 1-2 m tall, 5% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (55 records): 100% inland - further than 2 km from coast.
Altitude (55 records): 540 - 1120 m; 580 *lq* - 620 *med* - 620 *uq* m.



Landform (55 records): 82% deep soil, 16% shallow soil, 2% rocky outcrops.
Slope (55 records): 69% gentle incline, 27% steep incline, 2% hill top, 2% valley bottom.
Aspect (53 records): 74% North, 11% South, 8% West, 7% East.



Soil Type (55 records): 64% sandy, 18% gravelly, 16% loamy, 2% clayey.
Soil Colour (55 records): 56% grey, 31% brown, 9% orange, 2% yellow, 2% red.
Geology (55 records): 91% sandstone, 9% shale.
Vegetation (55 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Near Threatened D2(i).
Occurrence (Fynbos): 47 km^2 with 83% conserved and 7% lost; Occupancy: 31 km^2 with 96% conserved and 2% lost. Fragmentation index: 66%.
Nature Reserves (55 records): 100% in Nature Reserves - well conserved.
Habitat destruction (54 records): 100% extensive natural habitat.
Alien Invasive Species (54 records): 70% *Hakea*, 24% none, 6% *Pinus*.
Alien Density (53 records): 25% alien-free, 74% sparse, 2% abundant.

Cultivation & Utilization:
Picking (40 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Second flowering for year (AGR98102802 + 11-12);
The populations in this area appear to be well looked after (NAH95050301);

Confusing Species: None.
Records of identification queries = 2.

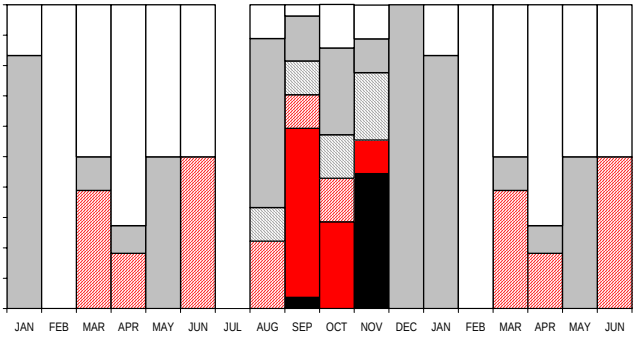
Variation and Taxonomy: No variation noted.

Distribution: Male flowers very fragrant.
Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDOLEN_m.jpg" * MERGEFORMAT \d

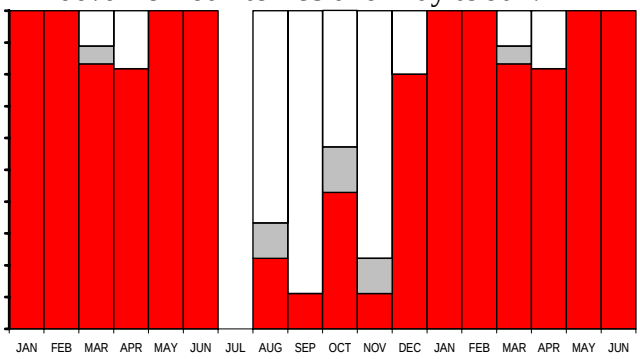
Leucadendron nervosum Phill. & Hutch. 1912
Silky-ruff Conebush
Syblaartolbos

Other Common Names: Jonaskop Conebush, Silky-leaf Conebush.
Other Scientific Names: *ciliatum* EMey 1844, *concolor* var. *ciliatum* Meisn. 1856.

104 Records
Population (66 records): 3% Abundant, 23% Common, 48% Frequent, 23% Rare, 3% Extinct.
Dispersion (55 records): 56% variable, 42% clumped, 2% evenly distributed.
Flowering (97 records with: Jan 6, Feb 1, Mar 18, Apr 11, May 2, Jun 2, Jul 0, Aug 9, Sep 27, Oct 7, Nov 9, Dec 5): Buds from Mar and Jun to Aug; Flowering from Sep to Oct; Peak Flowering from Nov; Over from Nov; Fruit from Dec to Jan, Aug and Oct; Nothing from Feb to Jun. Peak levels at 82% in Sep. Historically recorded as flowering in Sep, fruits retained.



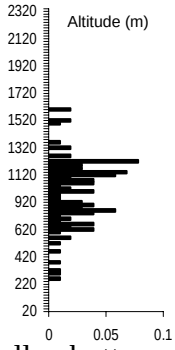
Growth (98 records with: Jan 7, Feb 1, Mar 18, Apr 11, May 2, Jun 2, Jul 0, Aug 9, Sep 27, Oct 7, Nov 9, Dec 5): Much from Dec to Aug and Oct; Rare not significant; None from Aug to Dec. Peak levels unreliable at 100% from Jan to Feb and May to Jun.



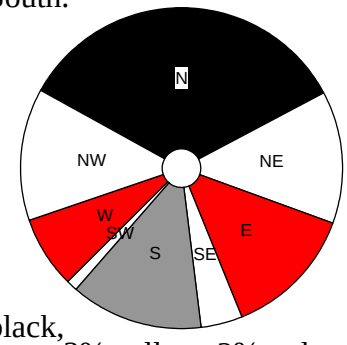
Seedlings (38 records): Absent in 95%: more seedlings than prefire adults in 1 case. Seedlings found in May.
Fire Survival : No data.
Age to first flowering: First flowers recorded at 6 years, 50% estimated at 5 years, and 100% recorded at 6 years.

Height (100 records): 2% 0-0.2 m tall, 32% 0.2-1 m tall, 59% 1-2 m tall, 7% 2-5 m tall.
Pollinators (12 records): 50% beetles, 33% flies, 8% birds, 8% bees or wasps.
Detailed Pollinators (4 records): Scarab Beetle (2), Honey Bee, Cape Sugarbird.

Habitat:
Distance to Ocean (66 records): 100% inland - further than 2 km from coast.
Altitude (66 records): 300 - 1500 m; 860 *lq* - 1020 *med* - 1060 *uq*m.



Landform (65 records): 78% deep soil, 18% shallow soil, 3% rocky outcrops.
Slope (66 records): 58% gentle incline, 30% steep incline, 6% hill top, 5% platform, 2% valley bottom.
Aspect (64 records): 57% North, 18% East, 13% West, 12% South.



Soil Type (65 records): 45% sandy, 20% loamy, 20% gravelly, 11% rocky, 5% peaty.
Soil Colour (63 records): 44% grey, 33% brown, 6% black, 6% white, 5% orange, 3% yellow, 2% red.
Geology (63 records): 100% sandstone.
Vegetation (66 records): 98% shrubland, 2% plantations.

Conservation Status and Threat:
Red Data List Status: Near Threatened A4d, Langeberg form: Endangered D.
Occurrence (Fynbos): 634 km^2 with 37% conserved and 5% lost; Occupancy: 85 km^2 with 34% conserved and 0% lost. Fragmentation index: 6%.
Nature Reserves (66 records): 17% in Nature Reserves - inadequately conserved.
Habitat destruction (66 records): 91% extensive natural habitat, 8% islands, 2% naturally linear habitats.
Alien Invasive Species (63 records): 38% none, 32% *Pinus*, 29% *Hakea*, 2% Myrtaceae.

Alien Density (63 records): 38% alien-free, 57% sparse, 3% abundant, 2% impenetrable.

Cultivation & Utilization:
Picking (82 records): 78% no sign of picking, 13% lightly picked, 9% severely picked.
Cultivation Status: Plantings - 38 records (37%), Augmentations - 3 records (3%).

Atlassers Notes:
7 plants survived the fire and many seedlings emerged (FWV95051301);
All remains of plants picked lying in veld source of plants unknown (AGR99092003); Picking was not severe on any plant but added up to a vast quantity (SMRY0041205);
Population of about 50 plants up to 2.2 m tall some starting to senesce! (NAH96030307); About 50 plants many up to 2 m tall (NAH96031601);
Lots of beetles (>10 per head) in all the heads (prognathous striped elytra) (AGR99092006); Large numbers of beetles seen (AGRY1111212);

Confusing Species: None noted.
Records of identification queries = 2.

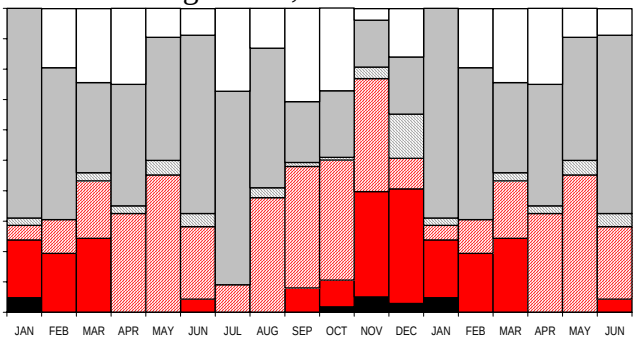
Variation and Taxonomy: No variation noted. *L. ciliatum* is *nomen nudum*.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDNERV_m.jpg" * MERGEFORMAT \d

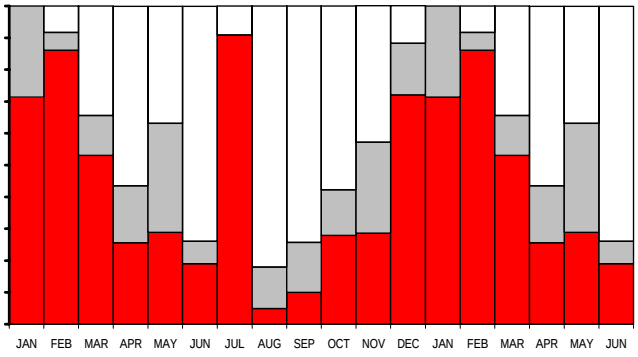
Leucadendron album (Thunb.) Fourc. 1781, 1934
Linear-leaf Conebush
Arbeitolsilwerbos

Other Common Names: Peach Conebush, Stawberry-cone Conebush, Stawberry-cone Silverbush, *Aarbeisilwertolbos.*
Other Scientific Names: *aurantica* Buek ex Meisn 1856, *proteoides* Phill & Hutch 1912.

672 Records
Population (665 records): 1% Abundant, 21% Common, 59% Frequent, 18% Rare.
Dispersion (616 records): 56% variable, 31% clumped, 8% widespread, 5% evenly distributed.
Flowering (651 records with: Jan 42, Feb 36, Mar 37, Apr 40, May 42, Jun 46, Jul 11, Aug 61, Sep 75, Oct 114, Nov 78, Dec 69): Buds from Apr to Jun and Aug to Nov; Flowering from Nov to Mar; Peak Flowering and Over not significant; Fruit from Jan to Oct; Nothing from Mar to Apr, Jul and Oct. Peak levels at 81% in Nov. Historically recorded as flowering in Dec, fruits retained.

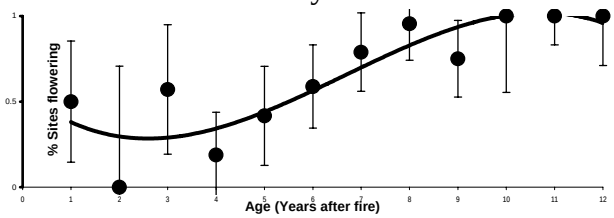


Growth (627 records with: Jan 42, Feb 36, Mar 32, Apr 39, May 38, Jun 42, Jul 11, Aug 61, Sep 70, Oct 111, Nov 77, Dec 68): Much from Oct to May; Rare from Jan, May and Nov; None from Mar to Nov. The July data appears spurious. Peak levels at 100% in Jan.



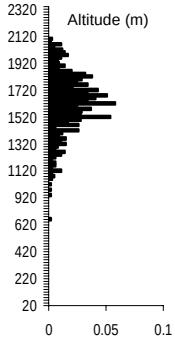
Seedlings (208 records): Absent in 75%: fewer seedlings than prefire adults in 9 cases, and more in 17 cases. Seedlings found in Mar (2), Apr, May, Jun, Jul, Aug (2), Oct (11), Nov and Dec (6).
Fire Survival (64 records): 67% survived by seedlings only, 17% escaped fires in fire-safe areas, 16% eliminated from the area by fires.

Age to first flowering: First flowers recorded at 1 year, 50% estimated at 5 years, and 100% recorded at 10 years.

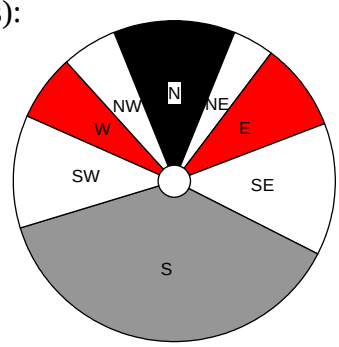


Height (654 records): 11% 0-0.2 m tall, 60% 0.2-1 m tall, 28% 1-2 m tall, 1% 2-5 m tall.
Pollinators (4 records): 50% beetles, 25% bees or wasps, 25% none observed.
Detailed Pollinators (1 record): Solitary Bee.

Habitat:
Distance to Ocean (653 records): 100% inland - further than 2 km from coast.
Altitude (653 records): 640 - 2000 m; 1380 *lq* - 1520 *med* - 1620 *uq* m.



Landform (643 records): 65% shallow soil, 25% deep soil, 9% rocky outcrops.
Slope (646 records): 63% steep incline, 29% gentle incline, 4% hill top, 3% cliff.
Aspect (616 records): 51% South, 18% North, 17% East, 15% West.



Soil Type (637 records): 47% sandy, 26% loamy, 14% rocky, 11% gravelly, 1% clayey.
Soil Colour (637 records): 45% grey, 42% brown, 9% black, 2% orange.
Geology (642 records): 98% sandstone, 2% shale.
Vegetation (646 records): 98% shrubland, 2% grassland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 7 800 km^2 with 41% conserved and 3% lost; Occupancy: 616 km^2 with 68% conserved and 0% lost. Fragmentation index: 3%.
Nature Reserves (653 records): 75% in Nature Reserves - well conserved.
Habitat destruction (608 records): 96% extensive natural habitat, 2% naturally linear habitats, 1% islands.
Alien Invasive Species (575 records): 94% none, 5% *Pinus*.

Alien Density (569 records): 95% alien-free, 4% sparse.

Cultivation & Utilization:
Picking (431 records): 97% no sign of picking, 2% severely picked, 1% lightly picked.
Cultivation Status: No noted cultivation.

Atlassers Notes:
This patch had a low sprawling growth form (DOA93022005);
Females only - skeletons seen of more! (AGR96121401);
Male plant (SGAY0123008);

Confusing Species: Confused with closely related species *L. dregei* (fleshy, hairless, green leaves) and silver forms of *L. rubrum* (very distinctive female cones), but has narrow silver leaves. A unique feature in the genus is a swelling at the base of the posterior perianth segment of male flowers.
Records of identification queries = 13.
Records of corrected identification queries = 6.

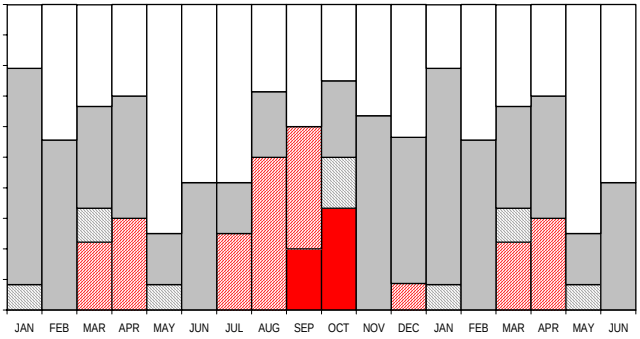
Variation and Taxonomy: Williams states that it shows little variation, although broader leaves than usual occur on the Swartberg. Atlassers recorded a sprawling form at DOA93022005.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDALBU_m.jpg" * MERGEFORMAT \d

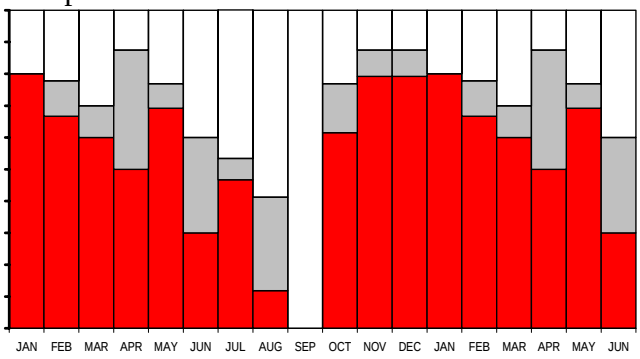
Leucadendron argenteum (L.) R.Br. 1753, 1810
Silver Tree
Witteboom

Other Common Names: Cape Silver Tree, Silver Conetree, Silver Pine Tree, Silvercone, Silvery Protea, *Silberbaum, Silwerboom.*
Other Scientific Names: *None.*

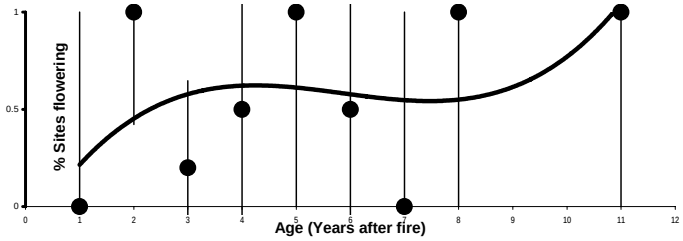
200 Records
Population (162 records): 38% Common, 43% Frequent, 18% Rare, 1% Extinct.
Dispersion (147 records): 72% variable, 23% clumped, 5% widespread.
Flowering (164 records with: Jan 24, Feb 9, Mar 9, Apr 10, May 12, Jun 12, Jul 12, Aug 14, Sep 5, Oct 12, Nov 22, Dec 23): Buds from Mar to Apr and Jul to Sep; Flowering from Sep to Oct; Peak Flowering not recorded; Over not significant; Fruit from Oct to Apr, Jun and Aug; Nothing from all year round. Peak levels at 60% in Sep. Historically recorded as flowering in Sep, fruit retained.



Growth (173 records with: Jan 25, Feb 9, Mar 10, Apr 8, May 13, Jun 10, Jul 15, Aug 17, Sep 5, Oct 13, Nov 24, Dec 24): Much from Oct to Jul; Rare from Apr, Jun and Aug; None from Jan to Mar and May to Oct. Peak levels at 88% from Nov to Dec and Apr.

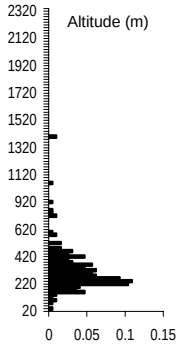


Seedlings (75 records): Absent in 95%: more seedlings than prefire adults in 2 cases. Seedlings found in Jul and Aug.
Fire Survival (7 records): 71% escaped fires in fire-safe areas, 14% survived by seedlings only, 14% resprouted from aerial trunks.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 4-6 years, and 100% recorded at 8 years. Flowering sporadic after 16 years.

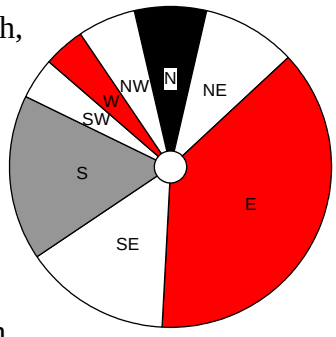


Height (195 records): 7% 0.2-1 m tall, 13% 1-2 m tall, 37% 2-5 m tall, 43% taller than 5 m.
Pollinators (1 record): 100% bees or wasps.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (155 records): 81% inland - further than 2 km from coast.
Altitude (156 records): 60 - 600 m; 220 $_{lq}$ - 260 $_{med}$ - 300 $_{uq}$m.



Landform (156 records): 92% deep soil, 7% shallow soil.
Slope (156 records): 59% steep incline, 38% gentle incline, 1% hill top, 1% platform.
Aspect (155 records): 54% East, 27% South, 11% North, 8% West.



Soil Type (154 records): 44% loamy, 33% sandy, 12% gravelly, 11% clayey.
Soil Colour (151 records): 72% brown, 12% orange, 11% grey, 2% yellow, 2% red.
Geology (147 records): 44% granite, 40% sandstone, 15% shale.
Vegetation (155 records): 78% shrubland, 6% thicket, 6% plantations, 5% woodland, 2% suburban, 1% forest.

Conservation Status and Threat:
Red Data List Status: Endangered A2c.
Occurrence (Fynbos): 687 km^2 with 12% conserved and 74% lost; Occupancy: 97 km^2 with 47% conserved and 46% lost. Fragmentation index: 7%.
Nature Reserves (156 records): 83% in Nature Reserves - well conserved.
Habitat destruction (151 records): 84% extensive natural habitat, 11% islands, 3% naturally linear habitats, 1% corridors, 1% naturally fragmented habitats.
Alien Invasive Species (150 records): 41% *Pinus*, 33% Fabaceae (chiefly alien

Acacia), 14% none, 8% Myrtaceae, 2% *Hakea*, 2% other aliens.
Alien Density (150 records): 14% alien-free, 59% sparse, 23% abundant, 3% dense.

Cultivation & Utilization:
Picking (102 records): 100% no sign of picking.
Cultivation Status: Plantings - 36 records (18%), Augmentations - 1 record, Escapes - 2 records (1%).

Atlassers Notes:
Many records of planted stands and augmented natural stands omitted.
Big plants escaped fire (CMO99051801); 4 big (about 5 m high) adults survived the fire (PVR93060602); Some of the trees were completely burnt - others the tops of the trees were growing (SHL96050102); Some of the trees are ancient (SHR92121301); Few adults survived the fire (WIJ98032204);
There are 4 large mature trees which may have been planted - the young ones appear to have been self - sown following the ca 1989 fire (PVR93053105); The young plants originating from 20 or so mature large trees which may have been planted - unlikely although may have been augmented in past - but this appears natural (PVR93070401); 1 dead plant seen (AGR92041207); 2 young and 1 dead (AGR99061901); 3 more dead seen: not fynbos or similar to any other site - possibly planted or survived from planting. no recruitment (AGR99080109); One dead revealed cones,59 trees were counted (NGF94101301); 12 plants were counted in this isolated cluster on a spur above Tafelberg Road - .these ranged from a height class 4 matriarch with abundant new and old cones to a height class 3 adolescent (SHR92101801); Several dozen trees seen on W slopes of Orangekloof (WIJ93112701); Old stand now within urban gardens (AGR92012401); No signs of seedlings except for silver trees - huge and stunning and lots! good recovery expected! (AGR96081803)

Confusing Species: None.

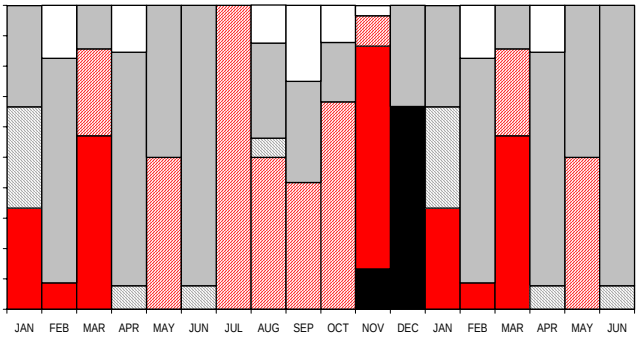
Variation and Taxonomy: No variation noted.

Distribution: Add.
INCLUDEPICTURE
"C:\\temp\\atlas\\LDARGE_m.jpg" *
MERGEFORMAT \d

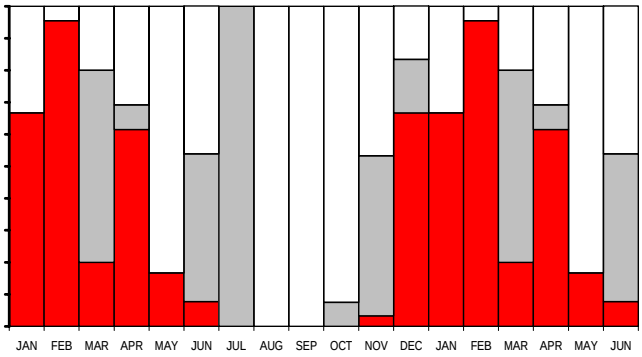
Leucadendron dregei Mey. ex Meisn. 1856
Summit Conebush
Oranjetolbos

Other Common Names: Dish Conebush, Orange-cone Conebush.
Other Scientific Names: *swartbergense* (Bolus) 1909.

184 Records
Population (180 records): 7% Common, 68% Frequent, 25% Rare.
Dispersion (160 records): 55% variable, 38% clumped, 4% widespread, 3% evenly distributed.
Flowering (171 records with: Jan 3, Feb 23, Mar 7, Apr 13, May 6, Jun 13, Jul 1, Aug 16, Sep 12, Oct 41, Nov 30, Dec 6): Buds from Mar, May, and Jul to Oct; Flowering from Mar and Nov; Peak Flowering from Dec; Over from Jan; Fruit from Jan to Feb, Apr to Oct and Dec; Nothing from Sep. Peak levels at 97% in Nov. Historically recorded as flowering from late Nov to early Dec, fruits retained.

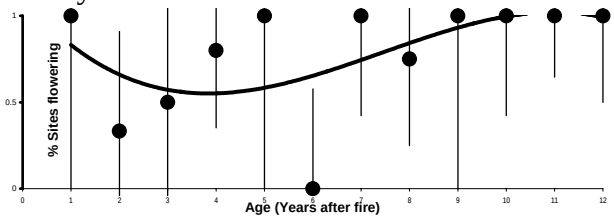


Growth (172 records with: Jan 3, Feb 22, Mar 5, Apr 13, May 6, Jun 13, Jul 6, Aug 16, Sep 12, Oct 40, Nov 30, Dec 6): Much from Dec to Apr; Rare from Mar, Jun to Jul and Nov; None from Jan, Mar to Jun and Aug to Nov. Peak levels at 96% in Feb.



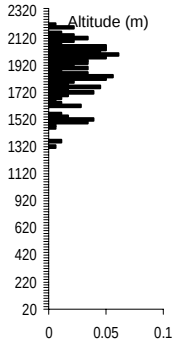
Seedlings (53 records): Absent in 89%: fewer seedlings than prefire adults in 2 cases, and more in 1 case. Seedlings found in Feb, Apr and Oct.
Fire Survival (15 records): 47% escaped fires in fire-safe areas, 27% eliminated from the area by fires, 13% survived by seedlings only, 13% resprouted from underground boles.

Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% recorded at 5 years, but sporadic after 14 years.

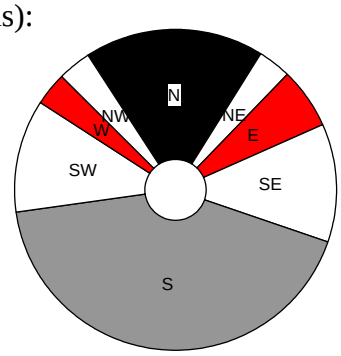


Height (179 records): 21% 0-0.2 m tall, 75% 0.2-1 m tall, 4% 1-2 m tall.
Pollinators (1 record): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (179 records): 100% inland - further than 2 km from coast.
Altitude (179 records): 1200 - 2120 m; 1620 *lq* - 1780 *med* - 1900 *uq* m.



Landform (173 records): 66% shallow soil, 18% deep soil, 16% rocky outcrops.
Slope (178 records): 54% steep incline, 24% gentle incline, 15% hill top, 6% cliff.
Aspect (149 records): 55% South, 22% North, 13% East, 10% West.



Soil Type (172 records): 43% sandy, 31% loamy, 19% rocky, 7% gravelly.
Soil Colour (169 records): 46% grey, 31% brown, 21% black, 1% yellow.
Geology (172 records): 98% sandstone, 2% shale.
Vegetation (177 records): 97% shrubland, 3% grassland.

Conservation Status and Threat:
Red Data List Status: Endangered B1a(i)b(iii,iv) + 2a(i)b(iii,iv),
Occurrence (Fynbos): 1 825 km^2 with 45% conserved and 1% lost; Occupancy: 221 km^2 with 77% conserved and 0% lost. Fragmentation index: 6%.
Nature Reserves (179 records): 81% in Nature Reserves - well conserved.
Habitat destruction (164 records): 95% extensive natural habitat, 2% naturally linear habitats, 2% naturally fragmented habitats, 1% islands.

Alien Invasive Species (148 records): 99% none, 0.7% *Hakea*.
Alien Density (148 records): 99% alien-free.

Cultivation & Utilization:
Picking (128 records): 99% no sign of picking, 0.8% lightly picked.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Resprouting (DOA93021004); Most killed - a few survivors (OUT98030704); Appeared to be resprouting with several stems (WIJ96040808); The 4 plants are very old and have obviously escaped many fires (DOA93080509);
2 are males and 2 females (DOA93080509); Only female plants seen (EGH92020402); Of 3 plants found - one a seedling 10 mm high (DOA93021004);

Confusing Species: Confused spuriously with *L. osbornei* and *pubescens*. Anticipated confusion with *L. album* did not materialize.
Records of identification queries = 7.
Records of corrected identification queries = 5.

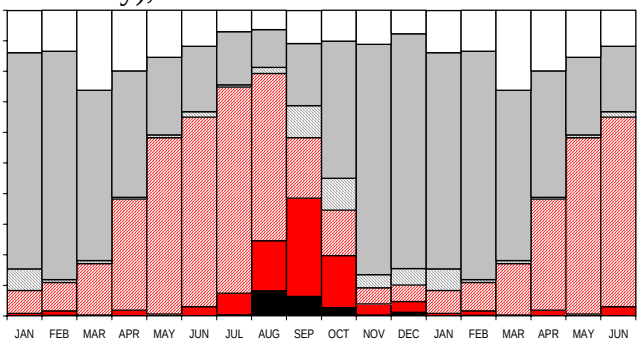
Variation and Taxonomy: Bolus described a male plant as a pincushion.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDDREG_m.jpg" * MERGEFORMAT \d

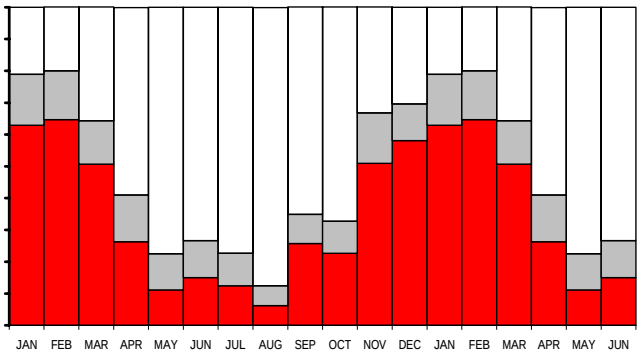
Leucadendron rubrum Burm.f 1768
Spinning Top
Tolletjiesbos

Other Common Names: Hillock Gisonia, Plumosum, Small-head Eurystermum, Spinning-top Conebush, Top Bush, *Dikkopeierbos, Tolbos, Waretolbos.*
Other Scientific Names: *arcuata* (Lam.) 1791, *collina* (Salisb. ex Knight) 1809, *obliqua* (Thunb.) 1781, *parviflorum* (L.) 1771, *plumosum* (Ait.) 1789.

4659 Records
Population (4624 records): 1% Abundant, 28% Common, 51% Frequent, 19% Rare.
Dispersion (4113 records): 66% variable, 26% clumped, 5% widespread, 2% evenly distributed.
Flowering (4551 records with: Jan 239, Feb 403, Mar 386, Apr 361, May 319, Jun 271, Jul 242, Aug 391, Sep 389, Oct 704, Nov 587, Dec 259): Buds from Apr to Sep; Flowering from Sep; Peak Flowering and Over not significant; Fruit from Sep to Jun; Nothing from Mar to Apr. Peak levels at 81% in Aug. Historically recorded as flowering from Aug or Sep (depending on locality), fruit retained.

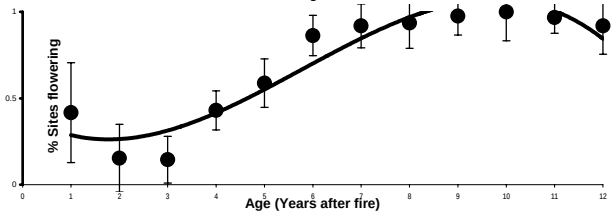


Growth (4489 records with: Jan 237, Feb 399, Mar 383, Apr 353, May 315, Jun 267, Jul 242, Aug 385, Sep 382, Oct 693, Nov 580, Dec 253): Much from Sep to Apr; Rare not significant; None from all year round. Peak levels at 80% in Feb.



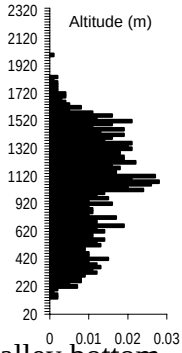
Seedlings (1886 records): Absent in 91%: fewer seedlings than prefire adults in 43 cases, and more in 42 cases. Seedlings found in Jan (5), Feb (8), Mar (17), Apr (6), May (6), Jun (8), Jul (3), Aug (7), Sep (2), Oct (9), Nov (8) and Dec (6).

Fire Survival (299 records): 73% survived by seedlings only, 14% escaped fires in fire-safe areas, 11% eliminated from the area by fires, 1% resprouted from underground boles.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% recorded at 10 years.

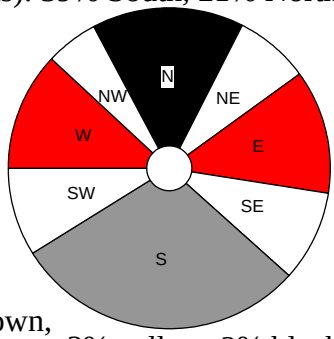


Height (4584 records): 3% 0-0.2 m tall, 39% 0.2-1 m tall, 53% 1-2 m tall, 5% 2-5 m tall.
Pollinators (26 records): 46% wind, 23% beetles, 19% birds, 4% bees or wasps, 4% flies, 4% none observed.
Detailed Pollinators (4 records): Orange-breasted Sunbird (2), Cape Sugarbird (2).

Habitat:
Distance to Ocean (4613 records): 100% inland - further than 2 km from coast.
Altitude (4613 records): 60 - 1940 m; 640 *lq* - 960 *med* - 1180 *uq* m.



Landform (4594 records): 60% deep soil, 36% shallow soil, 4% rocky outcrops.
Slope (4599 records): 48% gentle incline, 38% steep incline, 7% hill top, 4% platform, 1% valley bottom.
Aspect (4126 records): 39% South, 21% North, 21% East, 19% West.



Soil Type (4573 records): 42% sandy, 29% loamy, 12% rocky, 12% gravelly, 5% clayey.
Soil Colour (4569 records): 56% brown, 30% grey, 6% orange, 3% yellow, 2% black, 2% white, 1% red.
Geology (4436 records): 75% sandstone, 12% shale, 10% granite, 2% silcrete or ferricrete.
Vegetation (4596 records): 97% shrubland, 1% plantations.

Conservation Status and Threat:
Red Data List Status: LC, Cape Peninsula: Endangered A2c.
Occurrence (Fynbos): 38 849 km^2 with 22% conserved and 18% lost; Occupancy:

4 671 km^2 with 34% conserved and 9% lost. Fragmentation index: 4%.
Nature Reserves (4613 records): 37% in Nature Reserves.
Habitat destruction (4478 records): 91% extensive natural habitat, 5% islands, 2% naturally linear habitats, 1% road verges.
Alien Invasive Species (4377 records): 67% none, 16% *Pinus*, 8% *Hakea*, 8% Fabaceae (chiefly alien *Acacia*), 1% Myrtaceae.
Alien Density (4354 records): 67% alien-free, 26% sparse, 6% abundant, 1% dense.

Cultivation & Utilization:
Picking (3323 records): 97% no sign of picking, 2% lightly picked, 0.8% severely picked.
Cultivation Status: Plantings - 9 records, Augmentations - 2 records, Escapes - 2 records.
Witch's Broom Infestation: 2 records (0.04%).

Atlassers Notes:
Variation:
Few examples of dwarf plants found - anything exciting? (DFJ99070302 + 3 + 5);
Dark green silvery leaves! (AGR99090809);
Conflict with formal description:
Plants 3.5 m high (JAG95090301);
Leaves with 3 pointed teeth - about 2 mm deeply incised! (GEDY0062404); Leaves with multiple teeth at top (but not *Leucospermum* glands - mucros) - no cones though! (WIJ97080904);
Phenology:
Looks like a second flowering this season? (AGR97060102); Appears to be flowering for the second time this year (AGRY1091209);
With aborted flowers (AMMY1012913);
Damage:
Bushes broken by baboons (APE92100302);
Squirrels could have done some of the picking seen - cones removed! some small branches had definitely been picked by humans (LYM94041001); Baboon damage - broken & cones picked (LYM97011602); Baboon damage - cones ripped apart (LYM98091201);
All hacked in places (APE92071604); Picking for firewood (DJL97100110);
Young plants round where one had been chopped down (the chopped one was also sprouting from just above ground level) (SMR99120109);
Flowering:
Only male flowers found but one week later I saw at least one small female in bud (RDF95082001); Male in full profusion (WMP94092506);
Deaths:
Hardening - off - much death of new shoots (AGR92022101); All dead female - no young seen! (AGR95100607); plus 1 dead plant (AGR96051007, AGRY1020714, AGRY4110604, COJ98081001); No young seen for 3 species! - may be too early - no rains. But contrast with previous plot! - probably aspect (*vs* south for #12) killed them because of lack of rains since Easter (AGR96060513); 1/2? dead! (AGR97022616); 1 large dead female seen - no sign of any others (AGRY0081231); Lot of dead plants seen - only a few still alive (drought?) (AGRY1020812); 40% dead - drought? (AGRY2102605 + 06); A lot of dead (senescent?) female plants (AKS95111407); 1 Dead (ASP94081814); Some dead plants: single live was moribund (ASP94072710); Moribund : lots more dead (ASP94072713); Looks as if female plant is dying (AWA99100405); Much stressed - some plants dead (DJLY0021112); Many plants dying from roots upwards (OUT97052404); Many plants dying (OUT97052409 + 10); Lots of die-back (OUT98040409); Wide sweep of dieback down centre of valley (OUT99050705); Die back (OUT99100206); Several dead plants noted (same fungus as being used to kill *Hakea sericea*?) (WEL98042001); Some dying (WIJY1010404);
Only one seedling next to dead canopy of a large (>1m) female plant (MHO93031001);
Demography:
Male (AGRY1021414 + 18, AGRY4031104, AGRY4092603, ASP93061316);
One male (AGRY0100514); One male only - looked for more without success (AWA99051901); Again the lonely hearts plant (AWA98122203); One senescent male only (AKS95111404); Only 2 males seen (AGRY1030621); 4 males seen (RDF95082001); Only male plants (VCH98121707); 20 or 30 plants - all male (SMR97100110);
Female (AGRY1021419, AGRY4031305, AKS95111405); Both females (AGR96051007); All females (APE92101805); 3 adult plants (OUTY1032304); 1 male and 1 female (PAT94123106);
Picking:
Heaps of old leaves point to picking (AWA99100807); Neat cutting of stems (DFJ97092103); Almost all females were harvested (SMR99041408);
Plantings:
Apparently used for restoration of quarry - only seen in quarry: no adults just lots of young plants. Also lots of dead (ca 60%) (AGRY0112202); They have penetrated the Marloth N. R. by wind distribution because they were grown commercially in the adjacent fields up till 4 years ago when they all died (VJK94111901);
Other:
Orange Breasted Sunbirds active amongst plants - seem to prefer it to all other proteaceae in locality (DOA92111307);

Confusing Species: A very distinctive species. Isolated males not in flower were occasionally confused with *L. pubescens*. Silver forms were confused with *L.album,* but should not have been with the distinctive wind pollinated male and female flowerheads.
Records of identification queries = 25.
Records of corrected identification queries = 5.

Variation and Taxonomy: There are minor local variations in the size of features and pubescence.
- Botterberg is much more pubescent than normal.
- North Swartberg Pass has fewer, shorter basal bracts on female plants.

- Atlassers recorded silver forms at AGR99090809.
- Atlassers recorded dwarf forms at DFJ99070302 + 3 + 5.

Distribution: Add.

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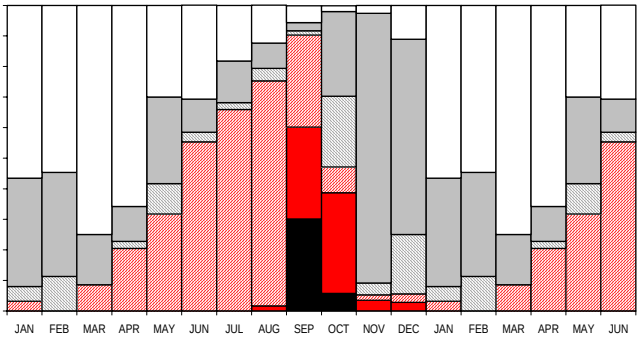
Leucadendron glaberrimum subspecies *glaberrimum* (Schltr.) Compton 1900, 1931
Common Oily Conebush
Botterpitjie

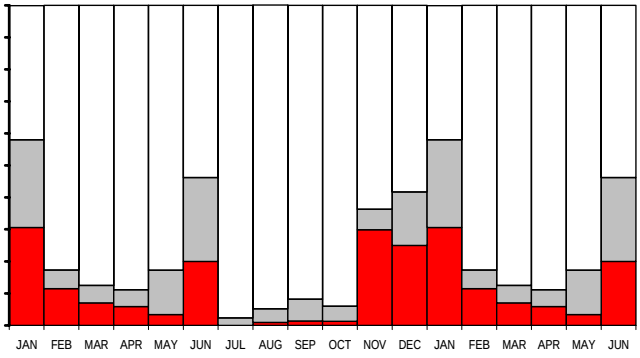
Other Common Names: *Oliebos, Perdepitjie.*
Other Scientific Names: *None.*

1359 Records

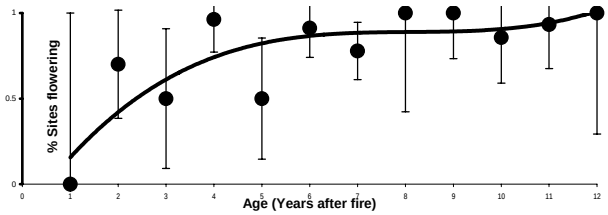
Population (1349 records): 26% Common, 59% Frequent, 14% Rare.
Dispersion (1255 records): 74% variable, 21% clumped, 5% widespread.
Flowering (1332 records with: Jan 62, Feb 53, Mar 128, Apr 307, May 60, Jun 65, Jul 44, Aug 121, Sep 73, Oct 155, Nov 228, Dec 36): Buds from Apr to Sep; Flowering from Sep to Oct; Peak Flowering from Sep; Over from Oct; Fruit from Oct to Feb and May; Nothing from Jan to Jun. Peak levels at 92% in Sep. Historically recorded as flowering from Sep to Oct, fruit ripen from Dec to Feb and are shed.



Growth (1295 records with: Jan 62, Feb 52, Mar 128, Apr 307, May 58, Jun 65, Jul 43, Aug 117, Sep 73, Oct 150, Nov 204, Dec 36): Much from Nov to Jan and Jun; Rare from Jan and Jun; None from all year round. Peak levels at 58% in Jan.

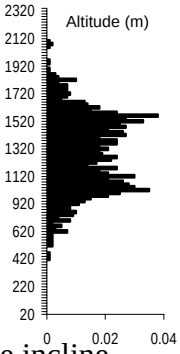


Seedlings (483 records): Absent in 95%: fewer seedlings than prefire adults in 9 cases, and more in 2 cases. Seedlings found in Jan (4), Jul, Sep, Oct, Nov (2) and Dec (2).
Fire Survival (61 records): 52% survived by seedlings only, 21% eliminated from the area by fires, 15% resprouted from underground boles, 10% escaped fires in fire-safe areas, 2% resprouted from aerial trunks.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 8 years. Some evidence for senescence after 16 years.

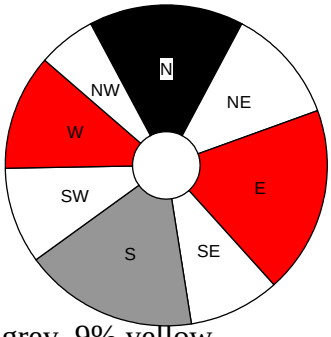


Height (1339 records): 13% 0-0.2 m tall, 81% 0.2-1 m tall, 6% 1-2 m tall.
Pollinators (11 records): 73% beetles, 9% butterflies or moths, 9% bees or wasps, 9% flies.
Detailed Pollinators (1 record): Monkey Beetle.

Habitat:
Distance to Ocean (1352 records): 100% inland - further than 2 km from coast.
Altitude (1352 records): 400 - 2000 m; 940 *lq* - 1160 *med* - 1380 *uq*m.



Landform (1342 records): 66% deep soil, 29% shallow soil, 5% rocky outcrops.
Slope (1338 records): 57% gentle incline, 23% steep incline, 10% platform, 5% hill top, 4% valley bottom, 0.9% cliff.
Aspect (1182 records): 29% East, 27% South, 24% North, 20% West.



Soil Type (1343 records): 51% sandy, 20% gravelly, 15% loamy, 12% rocky, 2% clayey.
Soil Colour (1337 records): 46% brown, 28% grey, 9% yellow, 8% orange, 6% white, 2% red.
Geology (1309 records): 81% sandstone, 18% shale.
Vegetation (1340 records): 99% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 3 246 km^2 with 14% conserved and 8% lost; Occupancy: 1 157 km^2 with 25% conserved and 5% lost. Fragmentation index: 29%.
Nature Reserves (1352 records): 24% in Nature Reserves.
Habitat destruction (1327 records): 92% extensive natural habitat, 5% islands, 3% naturally linear habitats.
Alien Invasive Species (1293 records): 84% none, 14% *Pinus*.
Alien Density (1286 records): 84% alien-free, 14% sparse, 1% abundant.

Cultivation & Utilization:
Picking (792 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Variation in size and habit:
Very small and stunted (JAT96093004);
Single stem sprawling (WIJ96072803); Single stem reddish fairly erect (WIJ96072807); Sprawling habit in this and all other plots today (WIJ98031202);
Upright bushes unlike the sprawling ones seen at higher altitudes (WIJ98031301);
Up to almost 2 m (WIJ98031315); Spindly plants to 3 m tall! (AGRY3112734);
Multi-stemmed (GEDY0112109); Extensive branching at base (WIJ94111411); Resprouted either below or at ground level (WIJ95042204); Resprouting? (WMPY0111204);
Plants differ from populations to north (e.g. SHR9510070102) as follows: (1) Decumbent - erroneously interpreted as resprouting from rootstock: but corrected -(2) Later flowering (3) Smaller leaves (SHR95100803);
Variation in hairiness:
Hairy with big cones (AGR99032619); Hairy! (AGR99032620); Very hairy old leaves (AGRY4110704);
Gun-metal grey (AGRY4110612);
Survival:
About 5% survived the fire - not burned in middle (AGR99032822);
Most plants dead (AGRY0091508); 3 dead to every one live (AGRY0093014); Dead (AGRY0112337); 2 plants dead (SAS98080804);
Miscellaneous:
A Blue Bottle was sitting on flowers (AWAY0102512); Ants (WMP99042608);
In cultivated lands with *Protea magnifica* - but not being cultivated (WMPY0042912);

Confusing Species: Considerable confusion existed in identifying the two subspecies of *L. glaberrimum*. Some 85% of queries and misidentifications of this species were due to inability or reluctance to achieve this. Almost all of these were in the KoueBokkeveld Mountains around the Olifants River where the two subspecies intergrade, and most were the result of the more colourful subspecies *erubescens* being drab when not in flower, and the obvious features not being present during new growth. An anticipated problem with *L. loranthifolium* (the most reliable feature is the colour of the florets, available for only four months of the year) was encountered outside of the flowering season. A few inexplicable misidentifications with *L. arcuatum* (a broad-leaved resprouter)
Records of identification queries = 127.
Records of corrected identification queries = 88.

Variation and Taxonomy: Originally described only in 1900 as a *Leucospermum*. This is a variable species, but none has been formally typified.
- Decumbent and erect forms occur, the erect forms tend to occur in the center of the distribution.
- Pubescent forms occur on the Baviaansberg.

Distribution: Add.
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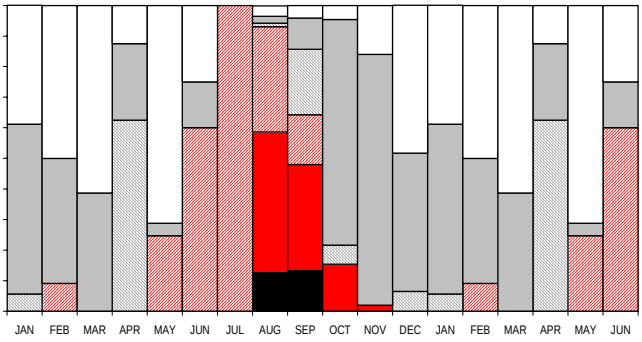
Leucadendron glaberrimum subspecies *erubescens* Williams 1972
Red Oily Conebush

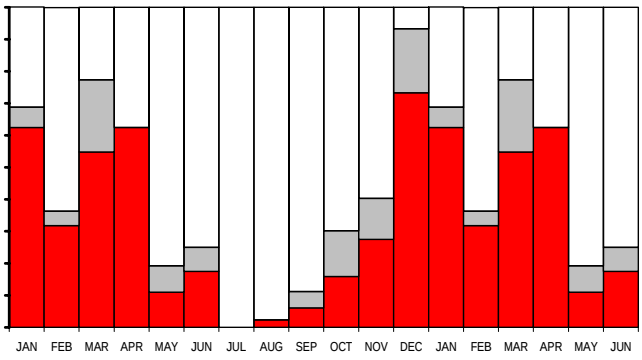
Other Common Names: None known.
Other Scientific Names: *None.*

634 Records

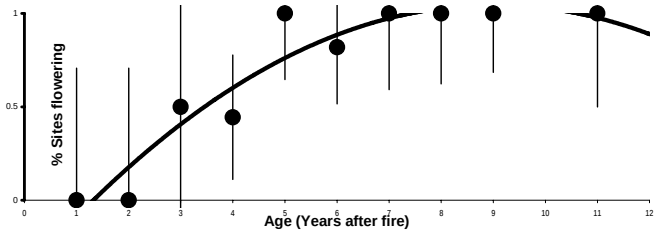
Population (629 records): 44% Common, 46% Frequent, 9% Rare.
Dispersion (595 records): 79% variable, 18% clumped, 2% widespread.
Flowering (624 records with: Jan 18, Feb 22, Mar 31, Apr 8, May 73, Jun 40, Jul 1, Aug 87, Sep 98, Oct 65, Nov 150, Dec 31): Buds from May to Aug; Flowering from Aug to Sep; Peak Flowering not significant; Over from Sep; Fruit from Oct to Apr; Nothing from Dec to Jun. Peak levels at 94% in Aug. Historically recorded as flowering from Aug to Sep, fruits ripen 3 months later and are shed.



Growth (618 records with: Jan 16, Feb 22, Mar 31, Apr 8, May 73, Jun 40, Jul 1, Aug 87, Sep 98, Oct 63, Nov 149, Dec 30): Much from Nov to Apr; Rare from Mar and Dec; None from Jan to Nov. Peak levels at 93% in Dec.

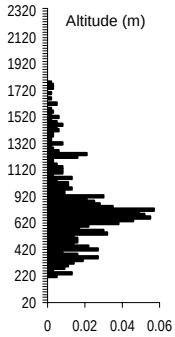


Seedlings (259 records): Absent in 97%: more seedlings than prefire adults in 4 cases. Seedlings found in Jan and Nov (3).
Fire Survival (54 records): 81% survived by seedlings only, 15% escaped fires in fire-safe areas, 4% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 5 years.

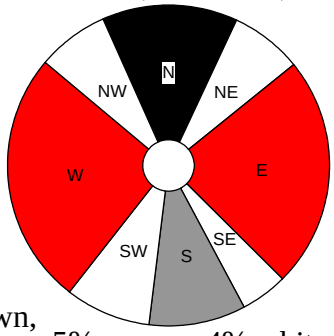


Height (627 records): 3% 0-0.2 m tall, 76% 0.2-1 m tall, 21% 1-2 m tall.
Pollinators (21 records): 81% beetles, 10% bees or wasps, 10% flies.
Detailed Pollinators (5 records): Monkey Beetle (3), Solitary Bee, Green Beetle.

Habitat:
Distance to Ocean (631 records): 100% inland - further than 2 km from coast.
Altitude (631 records): 200 - 1680 m; 520 $_{lq}$ - 660 $_{med}$ - 740 $_{uq}$m.



Landform (630 records): 78% deep soil, 20% shallow soil, 2% rocky outcrops.
Slope (627 records): 62% gentle incline, 23% steep incline, 7% hill top, 6% platform.
Aspect (558 records): 34% West, 30% East, 21% North, 16% South.



Soil Type (628 records): 56% sandy, 21% loamy, 18% gravelly, 3% rocky, 2% clayey.
Soil Colour (627 records): 55% brown, 27% grey, 5% yellow, 5% orange, 4% white, 4% red.
Geology (620 records): 82% sandstone, 17% shale, 1% silcrete or ferricrete.
Vegetation (630 records): 99% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 1 806 km^2 with 13% conserved and 16% lost; Occupancy: 519 km^2 with 19% conserved and 9% lost. Fragmentation index: 18%.
Nature Reserves (631 records): 23% in Nature Reserves.
Habitat destruction (612 records): 88% extensive natural habitat, 6% islands, 3% naturally linear habitats, 2% naturally fragmented habitats, 1% road verges.
Alien Invasive Species (610 records): 71% none, 19% *Pinus*, 6% Fabaceae (chiefly alien *Acacia*), 4% Myrtaceae.
Alien Density (608 records): 71% alien-free, 24% sparse, 4% abundant.

Cultivation & Utilization:
Picking (462 records): 100% no sign of picking.
Cultivation Status: Plantings - 1 record.

Atlassers Notes:
One plant (a male) was growing in a sprawling/trailing form (LYM99060907);
Beautiful colour cones and red/purple leaves (WMPY1111702);
Not at all colourful at this time of the year making the range and the slightly wider leaf base the features that distinguish it (NAH94012302);
New plants with much new growth others with flowers (AWA97090601);
1/3 dead (AGRY0030103); Many dead plants (AGRY0111122); Lot dead - almost half of plants (AGRY0111123);
70% or 80% were male (SMRY0030103);
Monkey Beetle and beetle with green stripes (ridges) (AGRY0082411); Spider (MWB94082002); Ant (MWB94082003);

Confusing Species: The major problem (77% of misidentifications) was identifying the subspecies of *L. glaberrimum* when not in flower (*erubescens* has broader leaf bases and is more erect). The grey form of *L. pubescens* (bigger and more branched) and also smaller plants of *L. loranthifolium* (more glaucous leaves) proved problematic outside of the flowering season when there were no flowerheads or cones on the plants. A misidentification with *L. gydoense* was encountered.
Records of identification queries = 93.
Records of corrected identification queries = 74.

Variation and Taxonomy: Williams records some variation, but atlassers only noted a few sports:
- Pubescent leaf forms occur at Visgat.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDGLABE_m.jpg" * MERGEFORMAT \d

Leucadendron loranthifolium (Salisb. ex Kn.) William 1809, 1967

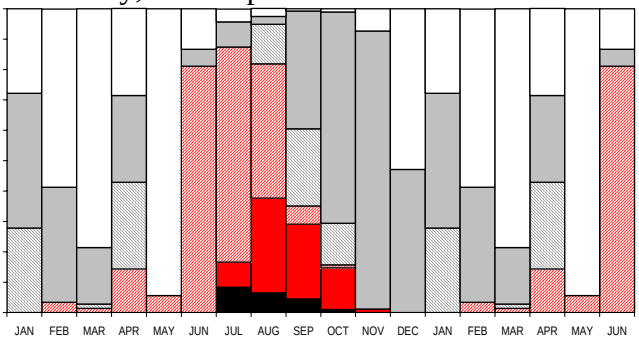
Green-flower Sunbush

Perdepitjie

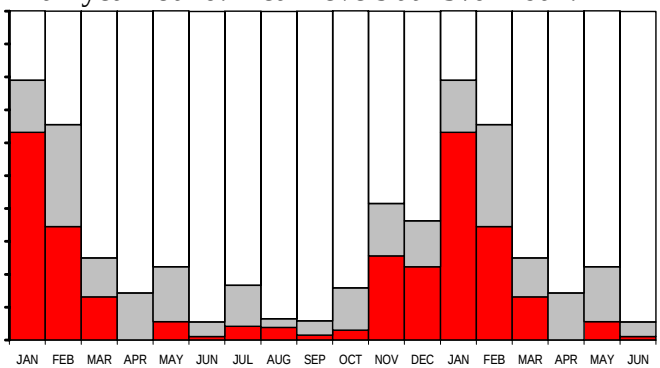
Other Common Names: Green-flower Conebush, Loranthus-leaf Protea.
Other Scientific Names: *pearsonii* Phill. 1913, *pseudospathulatum* Phill. & Hutch. 1912.

787 Records

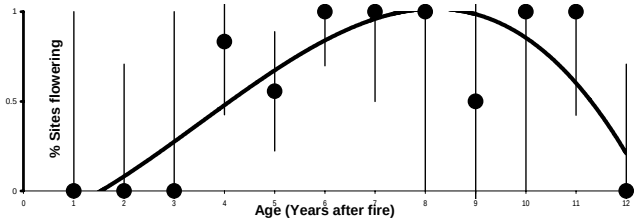
Population (783 records): 30% Common, 54% Frequent, 15% Rare.
Dispersion (730 records): 73% variable, 23% clumped, 3% widespread.
Flowering (772 records with: Jan 18, Feb 29, Mar 70, Apr 7, May 18, Jun 90, Jul 24, Aug 77, Sep 134, Oct 102, Nov 82, Dec 121): Buds from Jun to Aug; Flowering from Aug to Sep; Peak Flowering not significant; Over from Jan, Apr and Sep; Fruit from Sep to Feb and Apr; Nothing from Dec to May. Peak levels at 95% in Aug. Historically recorded as flowering from Jul to Sep, depending on locality, fruits ripen in Nov and are shed.



Growth (770 records with: Jan 19, Feb 29, Mar 68, Apr 7, May 18, Jun 90, Jul 24, Aug 76, Sep 135, Oct 101, Nov 82, Dec 121): Much from Nov to Feb; Rare from Feb; None from all year round. Peak levels at 79% in Jan.

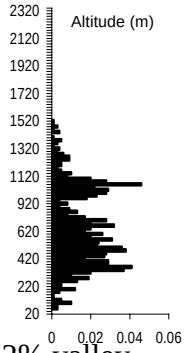


Seedlings (304 records): Absent in 99%: more seedlings than prefire adults in 1 case. Seedlings found in Oct.
Fire Survival (24 records): 75% survived by seedlings only, 13% eliminated from the area by fires, 13% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 6 years.

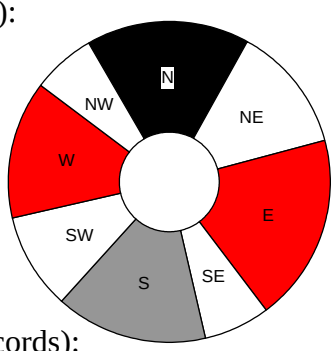


Height (778 records): 39% 0.2-1 m tall, 57% 1-2 m tall, 4% 2-5 m tall.
Pollinators (23 records): 52% beetles, 26% bees or wasps, 22% flies.
Detailed Pollinators (6 records): Monkey Beetle (3), Honey Bee (3).

Habitat:
Distance to Ocean (781 records): 100% inland - further than 2 km from coast.
Altitude (781 records): 40 - 1420 m; 400 *lq* - 580 *med* - 860 *uq* m.



Landform (774 records): 85% deep soil, 12% shallow soil, 3% rocky outcrops.
Slope (774 records): 65% gentle incline, 16% platform, 10% steep incline, 8% hill top, 2% valley bottom.
Aspect (630 records): 30% East, 24% North, 23% West, 23% South.



Soil Type (772 records): 76% sandy, 11% loamy, 9% gravelly, 3% rocky.
Soil Colour (770 records): 43% brown, 16% grey, 13% yellow, 10% red, 9% orange, 9% white.
Geology (755 records): 84% sandstone, 6% silcrete or ferricrete, 5% shale, 5% Tertiary sands.
Vegetation (774 records): 98% shrubland, 1% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Near Threatened A4c, B1b(iii,v) + 2b(iii,v), in Hex River Valley: Critically Endangered A3c.
Occurrence (Fynbos): 9 549 km^2 with 12% conserved and 23% lost; Occupancy: 893 km^2 with 9% conserved and 21% lost. Fragmentation index: 7%.
Nature Reserves (781 records): 12% in Nature Reserves - inadequately conserved.
Habitat destruction (767 records): 72% extensive natural habitat, 23% islands,

2% naturally fragmented habitats, 2% road verges, 0.9% naturally linear habitats.
Alien Invasive Species (733 records): 73% none, 17% Fabaceae (chiefly alien *Acacia*), 8% *Pinus*, 2% Myrtaceae.
Alien Density (731 records): 73% alien-free, 23% sparse, 3% abundant.

Cultivation & Utilization:
Picking (580 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Identification problems:
Young resemble young *L. pubescens* (AGR93071714);
No flowers - leaves are intermediate between given measurements of two species (AGRY3112701);
Variation:
Very narrow leaf form - difficulty with *L. glaberrimum* but very glaucous: in cone so no flowers (AGRY0110201);
Small leaf but glaucous - did not have the gizz of *L. glaberrimum* (AWA97090301);
Wide-leafed variety unlike those seen further south (WIJ98081508 + 9);
Recruitment:
Interfire recruitment! (AGR96111601 + 2); Young plants present in old veld (AGR96111612); Curiously about 90% of the plants in young veld (about 4-5 years old), none on older veld (>10 yrs old)! - is this a recruitment phenomenon? Does not appear to be dieback as no sign of dead plants! (AGRY5122903 + 4);
More common in old fields (AGR98062712); Extends into old lands (NSC95083104); Soil disturbance (ploughing) appears to stimulate recruitment (PMR98120611);
Appeared to be resprouting (WIJ95101504);
Mortality:
High mortality in patches (AGR92082301);
Pollination:
Male flowerheads covered with black ants (WIJ95101504);

Confusing Species: When not in flower easy to confuse with *L. glaberrimum* subsp. *erubescens* (but distributions do not overlap much, and leaves narrower and not glaucous),but more problems (61%) were encountered with the type subspecies, which is generally a much smaller bush in all features: however, most of the problems were in young veld, although the form without larger, crowded involucral leaves posed a major problem outside of flowering season. Without careful observation it is sometimes possible to overlook *L. loranthifolium* in *L. pubescens* stands, although confusion between the two species is unlikely. An odd case of confusion with *L. sheilae*, which is much smaller in all its features and out of range.
Records of identification queries = 91.
Records of corrected identification queries = 71.

Variation and Taxonomy: This is a variable species, but atlassers did not detect any obvious regional differences worthy of noting. Williams expressed dissatisfaction "at being unable to make a satisfactory sub-division of this plastic species when one so frequently encounters populations that appear to be distinct." The major variants he mentions are:

- Narrower leaf forms occur in the centre of its range.
- Large, broad, elliptic leaf forms (of the *pearsonii* type) are found in the north and west.
- Leaves narrowed to the base (of the *pseudospathulatum* type) occur in the north-east and south.
- A form with young branches and young leaves with a dense velvety pubescence occurs at Koudeberg to Ezelbank (Wupperthal).
- Larger, crowded involucral leaves are absent from populations from Lambertshoek, Witelskloof, Nieuwoud Pass and Algeria areas.

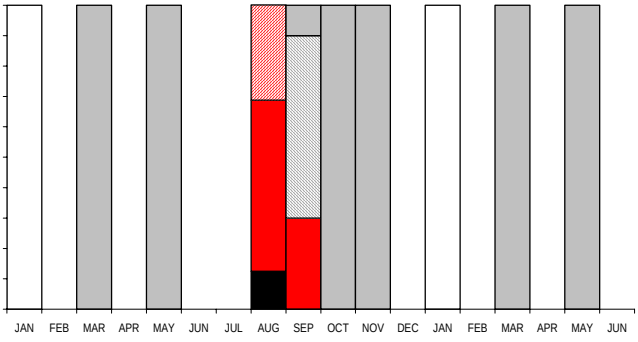
Distribution: Add.
INCLUDEPICTURE
"C:\\temp\\atlas\\LDLORA_m.jpg" *
MERGEFORMAT \d

Leucadendron meyerianum Buek. Ex Phill. & Hutch. 1912
Van Rhynsdorp Conebush

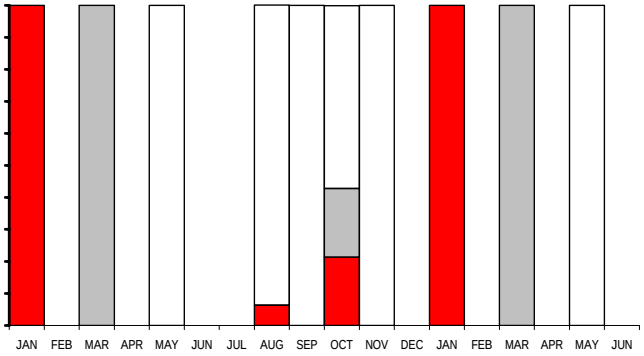
Other Common Names: None known.
Other Scientific Names: *None.*

48 Records

Population (47 records): 30% Common, 53% Frequent, 17% Rare.
Dispersion (42 records): 76% variable, 24% clumped.
Flowering (47 records with: Jan 1, Feb 0, Mar 1, Apr 0, May 3, Jun 0, Jul 0, Aug 16, Sep 10, Oct 14, Nov 2, Dec 0): Buds from Aug; Flowering from Aug to Sep; Peak Flowering not significant; Over from Sep; Fruit from Mar to May and Oct to Nov; Nothing from Jan. Peak levels unreliable at 100% in Aug. Historically recorded as flowering in Aug (Jun in cultivation), fruit in Dec, shed thereafter.



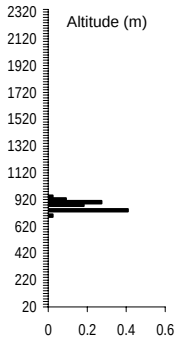
Growth (47 records with: Jan 1, Feb 0, Mar 1, Apr 0, May 3, Jun 0, Jul 0, Aug 16, Sep 10, Oct 14, Nov 2, Dec 0): Much from Oct and Jan; Rare from Mar and Oct; None from May to Nov. Peak levels unreliable at 100% in Jan.



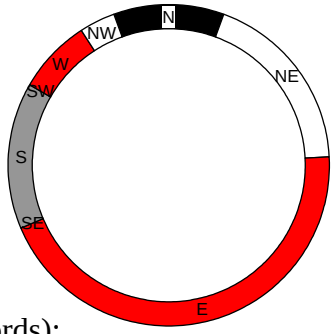
Seedlings (15 records): All without any seedlings present.
Fire Survival (1 record): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 100% at 7 years, no data from younger veld.

Height (47 records): 62% 0.2-1 m tall, 38% 1-2 m tall.
Pollinators (6 records): 100% beetles.
Detailed Pollinators (1 record): Monkey Beetle.

Habitat:
Distance to Ocean (44 records): 100% inland - further than 2 km from coast.
Altitude (44 records): 680 - 840 m; 720 $_{lq}$ - 740 $_{med}$ - 740 $_{uq}$m.



Landform (43 records): 67% deep soil, 26% shallow soil, 7% swamp.
Slope (44 records): 48% gentle incline, 32% platform, 20% hill top.
Aspect (27 records): 54% East, 22% North, 15% South, 9% West.



Soil Type (44 records): 80% sandy, 16% loamy, 2% clayey, 2% gravelly.
Soil Colour (44 records): 36% brown, 20% grey, 20% yellow, 16% orange, 7% white.
Geology (43 records): 100% sandstone.
Vegetation (44 records): 98% shrubland, 2% wooded grassland.

Conservation Status and Threat:
Red Data List Status: Endangered A3c, B1b(i,ii,iii,iv,v)c(iv) + 2b(i,ii,iii,iv,v)c(iv).
Occurrence (Fynbos): 112 km^2 with 0% conserved and 24% lost; Occupancy: 50 km^2 with 0% conserved and 16% lost. Fragmentation index: 39%.
Nature Reserves (44 records): 2% in Nature Reserves - unconserved.
Habitat destruction (44 records): 77% extensive natural habitat, 20% islands, 2% naturally linear habitats.
Alien Invasive Species (42 records): 81% none, 14% Fabaceae (chiefly alien *Acacia*), 2% *Pinus*, 2% other aliens.
Alien Density (42 records): 81% alien-free, 19% sparse.

Cultivation & Utilization:
Picking (33 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Leaves: 28 mm long, 1.5 mm wide in males and 31 mm long, 2 mm wide in females, stems red, leaves grey (metallic) (AGR92082502);
Leaves: male 2; 2; 1.5; 2.1; 1.25; 1.5; 1.25 mm wide, 30; 32; 26; 25; 35; 26; 29; 26; 25 mm long, female 1.5; 2; 1.5; 2; 1.5 wide, 32; 45; 26; 44; 23 mm long, stem and leaves both straw-green-yellow (AGR92082606);
Leaves: male 1; 1.5; 2.2 mm wide, 22; 36; 37; 38 mm long, female 2; 2; 2; 1.75 mm wide, 37; 48; 39; 40 mm long, stems and leaves straw green in colour (AGR92082701);
One big male (AGRY0102605);
About 20% senescent (NAH94032702);
Beetles 1: Green 2.5x9 mm body; 2: Blue hairy 5x10 mm body (WIJ93082902);
Rocky area is marginal habitat but is persisting even in old veld probably because shallow soils prevent overtopping by other species (NAHY5050102);

Confusing Species: Misidentified with *L. pubescens*, which does not occur within its range, and *L. sheilae* (with broad straw-green leaves, and smaller size).
Records of identification queries = 11.
Records of corrected identification queries = 5.

Variation and Taxonomy: This was regarded by Meisn (1856) as a form of *L. brunioides*, but this is unrelated: this was based on Buek's specimen, presumably annotated on the specimen with this name. There is also another unpublished name (by Schlech.): *arenicolum*.
No variation noted or known.
It has been proposed that this be sunk into *L. sheilae* (Horvarth 1993). This is rejected based on subsequent visits to the area which showed L. meyerianum to have leaves to 2 mm wide – needle-like with no lamina, and typically to be much bigger plants, with greyer leaves.

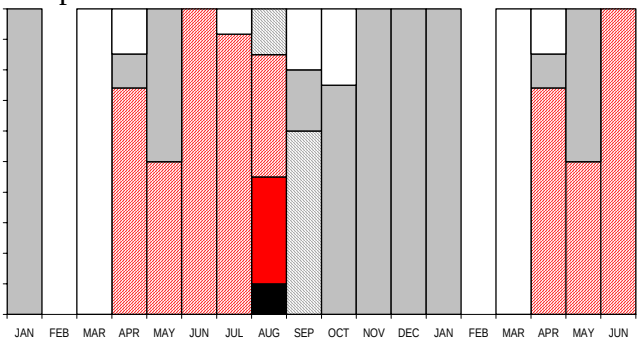
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDMEYE_m.jpg" * MERGEFORMAT \d

Leucadendron roodii Phill. 1913
Gifberg Conebush

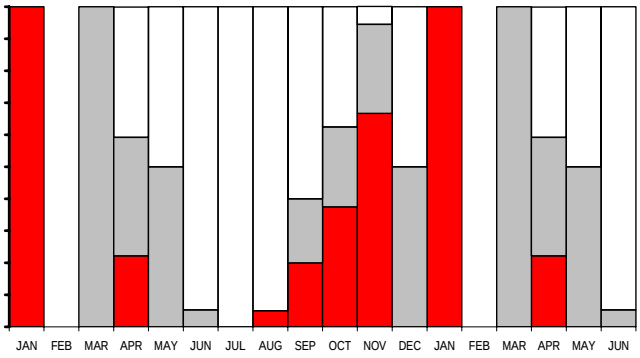
Other Common Names: None known.
Other Scientific Names: *acuminatum* Buek 1844, *concinnum* var. *latifolium* Meisn. 1856.

118 Records

Population (118 records): 28% Common, 47% Frequent, 25% Rare.
Dispersion (104 records): 60% variable, 40% clumped.
Flowering (117 records with: Jan 3, Feb 0, Mar 1, Apr 27, May 2, Jun 19, Jul 12, Aug 20, Sep 5, Oct 8, Nov 18, Dec 2): Buds from Apr to May; Flowering from Aug; Peak Flowering not significant in Aug; Over from Sep; Fruit from Sep to Jan; Nothing from Mar and Sep to Oct. Peak levels unreliable at 100% in Aug. Historically recorded as flowering from late Aug to early Sep, fruit ripen 3 months later and are shed.



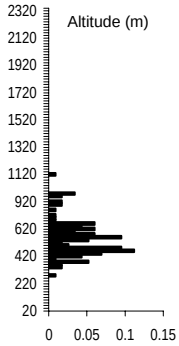
Growth (117 records with: Jan 3, Feb 0, Mar 1, Apr 27, May 2, Jun 19, Jul 12, Aug 20, Sep 5, Oct 8, Nov 18, Dec 2): Much from Jan, Apr and Sep to Nov; Rare from Mar to May and Sep to Dec; None from Apr to Oct and Dec. Peak levels unreliable at 100% in Jan.



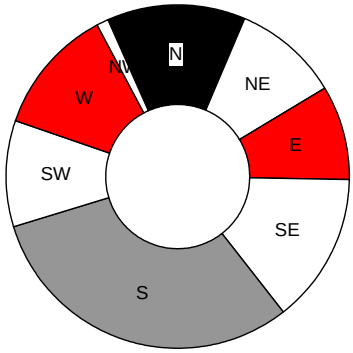
Seedlings (44 records): Absent in 91%: more seedlings than prefire adults in 2 cases. Seedlings found in Jul and Sep.
Fire Survival (7 records): 86% survived by seedlings only, 14% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 3-4 years, and 100% recorded at 4 years.

Height (117 records): 2% 0-0.2 m tall, 49% 0.2-1 m tall, 50% 1-2 m tall.
Pollinators (11 records): 82% beetles, 18% bees or wasps.
Detailed Pollinators (3 records): Monkey Beetle, Honey Bee, Green Monkey Beetle.

Habitat:
Distance to Ocean (116 records): 100% inland - further than 2 km from coast.
Altitude (116 records): 260 - 1020 m; 440 $_{lq}$ - 480 $_{med}$ - 560 $_{uq}$m.



Landform (115 records): 94% deep soil, 6% shallow soil.
Slope (116 records): 67% gentle incline, 22% hill top, 11% platform.
Aspect (91 records): 43% South, 20% East, 19% North, 18% West.



Soil Type (116 records): 92% sandy, 6% loamy.
Soil Colour (115 records): 37% brown, 20% yellow, 18% red, 11% grey, 10% white, 4% orange.
Geology (116 records): 88% sandstone, 12% silcrete or ferricrete.
Vegetation (116 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Vulnerable B1a(ii)b(ii,iii,iv,v) + 2a(ii)b(ii,iii,iv,v).
Occurrence (Fynbos): 332 km^2 with 1% conserved and 17% lost; Occupancy: 120 km^2 with 3% conserved and 26% lost. Fragmentation index: 22%.
Nature Reserves (116 records): 5% in Nature Reserves - inadequately conserved.
Habitat destruction (116 records): 55% extensive natural habitat, 40% islands, 4% naturally fragmented habitats.
Alien Invasive Species (112 records): 65% none, 33% Fabaceae (chiefly alien *Acacia*), 2% *Pinus*.
Alien Density (111 records): 66% alien-free, 30% sparse, 5% abundant.

Cultivation & Utilization:
Picking (86 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.
Witch's Broom Infestation: 1 record (0.8%).

Atlassers Notes:
About 1 000 plants! (AGR97040633); One female plant near borrow pit (SHR97010303);
7 out of original population of 9 now dead; root fungus? (NAH98041902); 7 out of 8 previously alive plants have died this summer at this locality leaving only one young plant alive (NAHY0072301);
Bees and small black beetles (AWA96082006); Ants walking on flowerheads (AWA98083001); Beetle: brown with black head, 8x5 mm body (WIJ93083006);
All plants on edge and inside lands (AGR95081210); Some plants growing on old ploughed land (fallow land) (LYM97061506); Only one patch seen, at roadside (WIJ93083006);

Confusing Species: Confused with *L. loranthifolium* when not in flower or fruit when the sacculate basal bracts are not apparent.
Records of identification queries = 22.
Records of corrected identification queries = 16.

Variation and Taxonomy: No variation known.

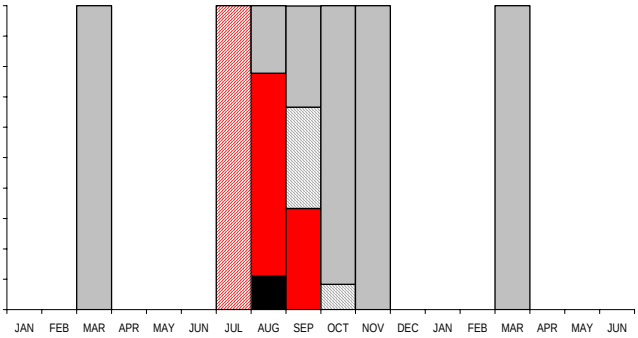
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDROOD_m.jpg" * MERGEFORMAT \d

Leucadendron sheilae Williams 1972
Lokenberg Conebush

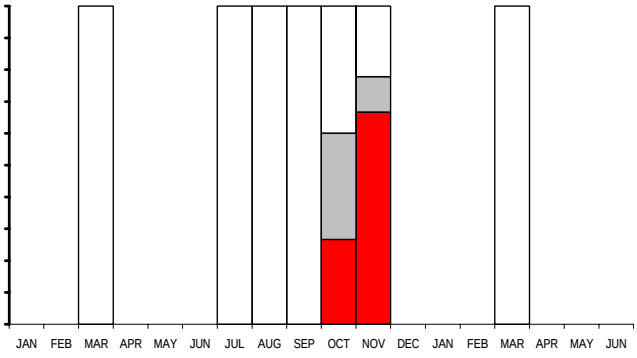
Other Common Names: None known.
Other Scientific Names: *None.*

90 Records

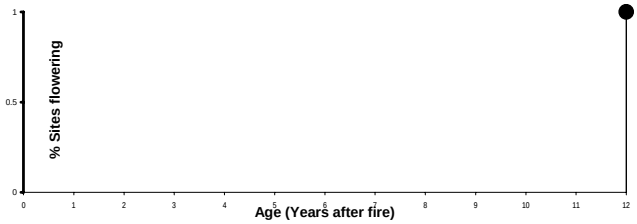
Population (90 records): 38% Common, 48% Frequent, 14% Rare.
Dispersion (81 records): 79% variable, 20% clumped, 1% evenly distributed.
Flowering (87 records with: Jan 0, Feb 0, Mar 1, Apr 0, May 0, Jun 0, Jul 1, Aug 9, Sep 6, Oct 60, Nov 10, Dec 0): Buds from Jul; Flowering from Aug to Sep; Peak Flowering insignificant; Over from Sep; Fruit from Aug to Mar; Nothing not recorded. Peak levels unreliable at 78% in Aug. Historically recorded as flowering in Aug, fruit in Dec, shed.



Growth (86 records with: Jan 0, Feb 0, Mar 1, Apr 0, May 0, Jun 0, Jul 1, Aug 9, Sep 6, Oct 60, Nov 9, Dec 0): Much from Oct to Nov; Rare from Oct; None from all year round. Peak levels unreliable at 78% in Nov.

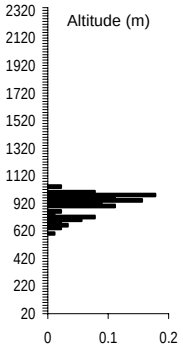


Seedlings (44 records): Absent in 95%: more seedlings than prefire adults in 1 case. Seedlings found in Oct.
Fire Survival (1 record): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 2 years. Insufficient data to determine age to 50% and 100% flowering.

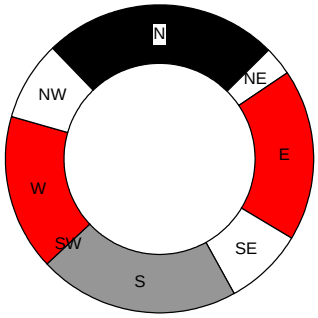


Height (89 records): 58% 0.2-1 m tall, 40% 1-2 m tall, 1% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (90 records): 100% inland - further than 2 km from coast.
Altitude (90 records): 580 - 940 m; 740 $_{lq}$ - 840 $_{med}$ - 840 $_{uq}$m.



Landform (90 records): 80% deep soil, 19% shallow soil, 1% rocky outcrops.
Slope (90 records): 57% gentle incline, 20% hill top, 19% platform, 3% valley bottom, 1% steep incline.
Aspect (61 records): 30% North, 25% South, 24% East, 20% West.



Soil Type (90 records): 74% sandy, 21% loamy, 3% gravelly, 1% clayey.
Soil Colour (88 records): 31% yellow, 26% brown, 20% grey, 15% red, 6% orange, 2% white.
Geology (88 records): 77% sandstone, 22% silcrete or ferricrete, 1% shale.
Vegetation (90 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Vulnerable A3c.
Occurrence (Fynbos): 232 km^2 with 14% conserved and 1% lost; Occupancy: 117 km^2 with 20% conserved and 1% lost. Fragmentation index: 37%.
Nature Reserves (90 records): 10% in Nature Reserves - inadequately conserved.
Habitat destruction (89 records): 51% extensive natural habitat, 49% islands.
Alien Invasive Species (87 records): 98% none, 2% *Pinus*.
Alien Density (87 records): 98% alien-free, 2% sparse.

Cultivation & Utilization:
Picking (55 records): 100% no sign of picking.

Cultivation Status: No noted cultivation.

Atlassers Notes:
Leaves: female 3; 3 mm, males 3; 2.5; 2.0 mm broad and females 35; 34, males 26; 29; 31 mm long. Leaves and stem straw coloured (AGR92082405); Leaves: female 4.5 mm broad, 31 mm long; male 4; 4; 4; 4; 3.5 mm broad, 31; 41; 31; 41; 25 mm long. Leaves and stems pale straw green (AGR92082408); Leaves: males 32; 32; 35; 40; 41; 38 mm long, 5; 4; 4; 5; 6; 4 mm wide, females 37; 33 mm long, 4.5; 4 mm wide (AGR92082801); Leaves: males 41 mm long, 4 mm wide, females 43 mm long, 5.5 mm wide (AGR92082803);
Tony claims it is *L. sheilae* but you might as well call a bird a fish the leaves are by far too narrow (AMMY0103004);

Confusing Species: Misidentified with L. meyerianum (which has much narrower leaves). Also with *L. remotum* and *brunoioides,* which have quite different seeds and appearances.
Records of identification queries = 19.
Records of corrected identification queries = 14.

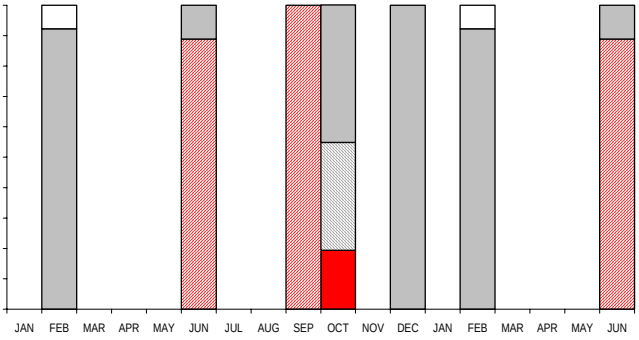
Variation and Taxonomy: No variation noted, but leaves northern populations have leaves narrower (2-3.5 mm broad in males, and 3-4.5 mm in females) than described, but not approaching the needle-like leaves of *L. meyerianum* which are typically 1 mm wide, not exceeding 2 mm,.
It has been proposed that this be sunk into *L. meyerianum* (Horvarth 1993), but this is rejected based on subsequent visits to the area.

Distribution: Add.
INCLUDEPICTURE
"C:\\temp\\atlas\\LDSHEI_m.jpg" *
MERGEFORMAT \d

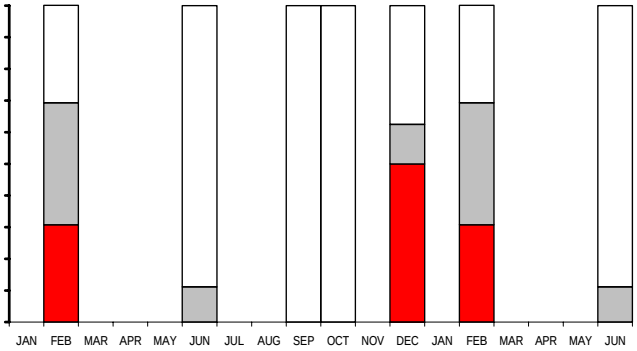
Leucadendron cadens Williams 1972
Witteberg Sunbush

Other Common Names: Witteberg Sprawling Conebush.
Other Scientific Names: *None.*

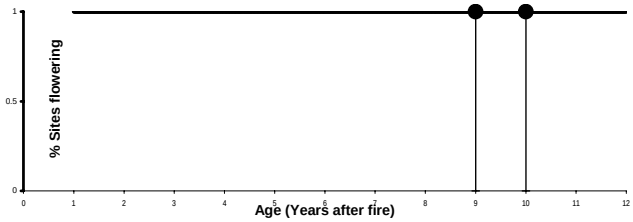
92 Records
Population (90 records): 41% Common, 44% Frequent, 13% Rare, 1% Extinct.
Dispersion (80 records): 80% variable, 19% clumped, 1% evenly distributed.
Flowering (89 records with: Jan 0, Feb 39, Mar 0, Apr 0, May 0, Jun 9, Jul 0, Aug 0, Sep 2, Oct 31, Nov 0, Dec 8): Buds from Jun to Sep; Flowering in Oct; Peak Flowering not recorded; Over from Oct; Fruit from Oct to Feb; Nothing not significant. Peak levels unreliable at 55% in Oct. Historically recorded as flowering in Oct, fruit in Jan and shed.



Growth (89 records with: Jan 0, Feb 39, Mar 0, Apr 0, May 0, Jun 9, Jul 0, Aug 0, Sep 2, Oct 31, Nov 0, Dec 8): Much from Dec to Feb; Rare from Feb; None from all year round. Peak levels unreliable at 69% in Feb.

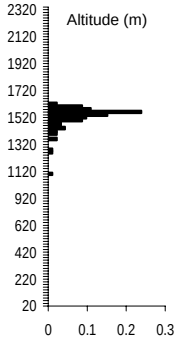


Seedlings (26 records): Absent in 92%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jun.
Fire Survival (4 records): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 100% at 9 years, no data for younger veld.

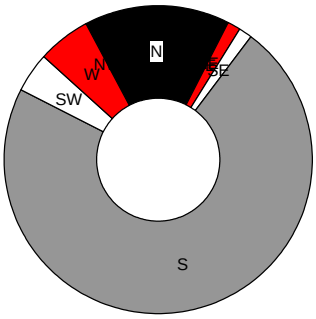


Height (90 records): 36% 0-0.2 m tall, 64% 0.2-1 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (92 records): 100% inland - further than 2 km from coast.
Altitude (92 records): 980 - 1520 m; 1380 $_{lq}$ - 1440 $_{med}$ - 1440 $_{uq}$m.



Landform (90 records): 58% deep soil, 40% shallow soil, 2% rocky outcrops.
Slope (91 records): 42% gentle incline, 26% steep incline, 26% hill top, 4% platform, 1% valley bottom.
Aspect (72 records): 75% South, 15% North, 8% West, 2% East.



Soil Type (88 records): 48% loamy, 20% gravelly, 19% rocky, 13% sandy.
Soil Colour (91 records): 49% grey, 37% brown, 5% yellow, 4% orange, 3% red.
Geology (57 records): 81% sandstone, 19% shale.
Vegetation (91 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 132 km^2 with 16% conserved and 1% lost; Occupancy: 92 km^2 with 10% conserved and 0% lost. Fragmentation index: 55%.
Nature Reserves (92 records): 8% in Nature Reserves - inadequately conserved.
Habitat destruction (91 records): 99% extensive natural habitat, 1% naturally linear habitats.
Alien Invasive Species (90 records): 100% none.
Alien Density (90 records): 100% alien-free.

Cultivation & Utilization:
Picking (41 records): 100% no sign of picking.

Cultivation Status: No noted cultivation.

Atlassers Notes:
Not prostrate but low bush peculiar - follow up - could be some leaked genes from *L. barkerae*? (AGR96121310); Some 2 plants erect, some semi-erect, but most sprawling (AGRY1020719);
Appears to dominate in young veld and quickly dies out - not much in older patches but lots of dead skeletons (AGRY1020714); Only skeletons seen (from this fire cycle - veld too old?) - must have been frequent earlier in the seral cycle (AGRY1020721); Most of plants deceased (AMMY1020714);

Confusing Species: None noted.
Records of identification queries = 2.

Variation and Taxonomy: Although Williams notes that there is no variation in this species, this is only true on Witteberg itself. Plants from ranges to the south include erect and semi-erect habits, up to 1.5 m tall.

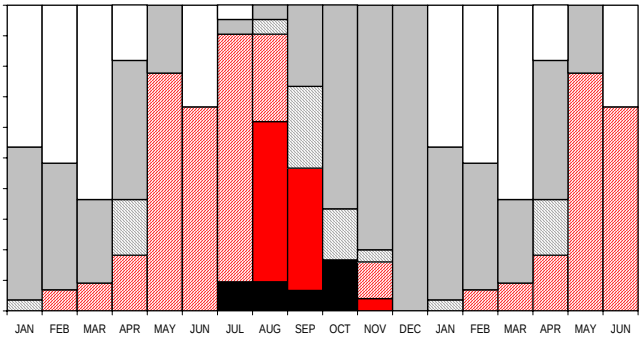
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDCADE_m.jpg" * MERGEFORMAT \d

Leucadendron daphnoides (Thunb.) Meisn. 1806, 1856
DuToitskloof Conebush
Reusepoeierkwas

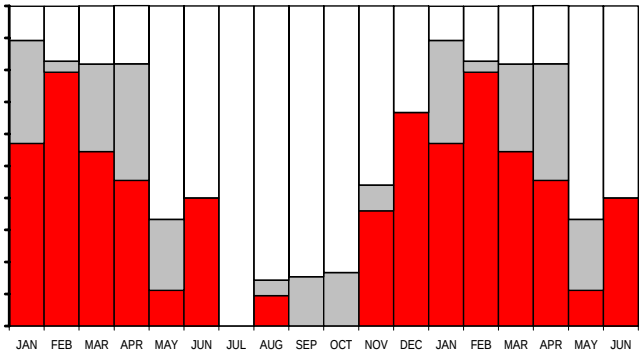
Other Common Names: Giant Pompom.
Other Scientific Names: *concolor* var *insigne* Meisn. 1856, *concolor* var. *lanceolatum* Meisn. 1856, *grandiflorum* Drege 1844, *retusum* Drege 1844, *rugosum (Thunb.) 1803, venosum* R.Br. 1810.

188 Records

Population (180 records): 22% Common, 53% Frequent, 25% Rare.
Dispersion (158 records): 68% variable, 26% clumped, 6% widespread.
Flowering (185 records with: Jan 28, Feb 29, Mar 11, Apr 11, May 9, Jun 6, Jul 21, Aug 21, Sep 15, Oct 6, Nov 25, Dec 3): Buds from May to Aug; Flowering from Aug to Sep; Peak Flowering not significant; Over from Sep; Fruit from Sep to May; Nothing from Jan to Mar. Peak levels at 95% in Aug. Historically recorded as flowering from Jul to late Sep depending on locality, fruit ripen after 3 months and are shed.



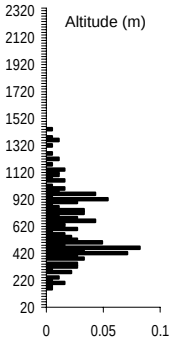
Growth (182 records with: Jan 28, Feb 29, Mar 11, Apr 11, May 9, Jun 5, Jul 21, Aug 21, Sep 13, Oct 6, Nov 25, Dec 3): Much from Nov to Apr and Jun; Rare from Jan and Mar to May; None from May to Dec. Peak levels at 89% in Jan.



Seedlings (69 records): Absent in 88%: fewer seedlings than prefire adults in 4 cases. Seedlings found in Oct and Nov (3).
Fire Survival (4 records): 75% escaped fires in fire-safe areas, 25% survived by seedlings only.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 2-3 years, and 100% recorded at 10 years.

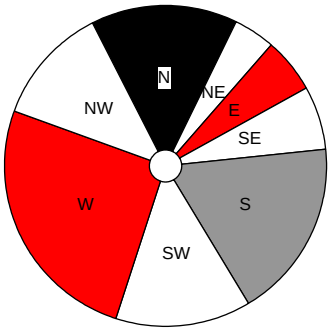
Height (186 records): 46% 0.2-1 m tall, 53% 1-2 m tall, 1% 2-5 m tall.
Pollinators (5 records): 40% bees or wasps, 40% beetles, 20% flies.
Detailed Pollinators (2 records): Snout Weevil, Honey Bee.

Habitat:



Distance to Ocean (176 records): 100% inland - further than 2 km from coast.
Altitude (176 records): 140 - 1340 m; 420 *lq* - 540 *med* - 740 *uq*m.

Landform (176 records): 90% deep soil, 9% shallow soil.
Slope (176 records): 49% gentle incline, 47% steep incline, 2% hill top, 2% platform.
Aspect (168 records): 39% West, 27% South, 24% North, 9% East.



Soil Type (175 records): 59% loamy, 19% sandy, 13% gravelly, 7% clayey, 2% rocky.
Soil Colour (175 records): 66% brown, 16% orange, 11% grey, 5% yellow, 1% red.
Geology (168 records): 52% granite, 23% sandstone, 23% shale.
Vegetation (175 records): 86% shrubland, 13% plantations.

Conservation Status and Threat:
Red Data List Status: Endangered A2c.
Occurrence (Fynbos): 1 117 km^2 with 48% conserved and 29% lost; Occupancy: 148 km^2 with 38% conserved and 26% lost. Fragmentation index: 11%.
Nature Reserves (176 records): 14% in Nature Reserves - inadequately conserved.
Habitat destruction (171 records): 89% extensive natural habitat, 4% road verges, 4% naturally linear habitats, 3% islands.

Alien Invasive Species (176 records): 55% *Pinus*, 20% Fabaceae (chiefly alien *Acacia*), 16% *Hakea*, 5% none, 3% Myrtaceae, 0.6% other aliens.
Alien Density (175 records): 5% alien-free, 55% sparse, 31% abundant, 7% dense, 2% impenetrable.

Cultivation & Utilization:
Picking (146 records): 97% no sign of picking, 3% lightly picked.
Cultivation Status: Plantings - 4 records (2%), Augmentations - 1 record, Escapes - 4 records (2%).

Atlassers Notes:
Burnt and chopped down in May 1993 no seedlings found (OGM93082001);
Bottelary Hills: No signs of plants having been planted! No sign of it being anywhere else nearby though - assumed escaped (AGR99032201); Next to post office tower road and probably planted as others have been - about 30 plants (WIJ93062504);
Young pine plantation - population threatened (AGR93090502); Etiolated - growing under pines (LYM99012702); This extended population is about to be smothered by a newly planted pine plantation covering some 100 ha (NAH96090201);
1/2 dead (AGR96082105); Most of the population was under stress - dying from bottom to tip - Root Rot Fungus? (IEB99041404);
Weevils - Lots - some hundred on flowerheads! But don't fly? (AGR98082003);

Confusing Species: Most commonly confused with *L. tinctum* (which does not have the adpressed involucral bracts and erect involucral bracts), but is superficially similar when not in flower. A single instance of confusion with *L. sessile* (which is smaller and does not have the involucral leaves adpressed). Odd errors with *L. dregei* (no similarity!) and *verticillatum* as small seedlings.
Records of identification queries = 16.
Records of corrected identification queries = 8.

Variation and Taxonomy: The name *L. insigne* Buek in Drege (1844) is a *nomen nudum*. *Protea rugosa* has priority but the specimen is too poor, according to Williams, to be certain of its identity.
There is little variation ('a fairly constant species'), except:
- The male perianth may be hairless (Kaaimansgat) or pubescent (Kleindrakenstein), but the significance and extent of this variation is not noted.

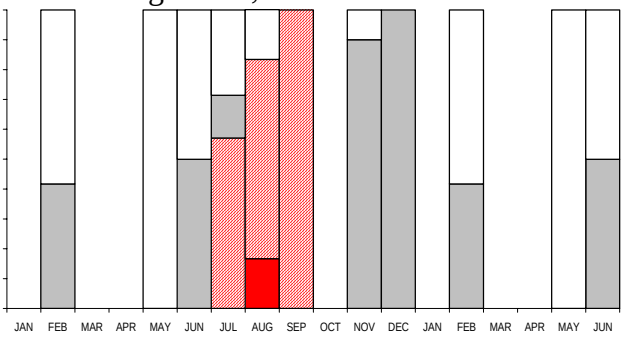
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDDAPH_m.jpg" * MERGEFORMAT \d

Leucadendron gydoense Williams 1967
Gydo Conebush

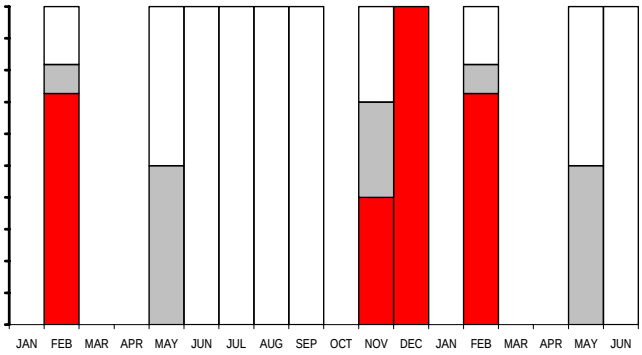
Other Common Names: None known.
Other Scientific Names: *None.*

45 Records

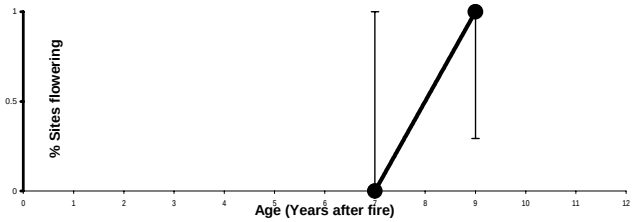
Population (44 records): 36% Common, 45% Frequent, 18% Rare.
Dispersion (41 records): 73% variable, 27% clumped.
Flowering (45 records with: Jan 0, Feb 12, Mar 0, Apr 0, May 2, Jun 2, Jul 7, Aug 6, Sep 5, Oct 0, Nov 10, Dec 1): Buds from Jul to Sep; Flowering from Aug; Peak Flowering and Over not recorded; Fruit from Nov to Feb and Jun; Nothing from Feb to Jul. Peak levels unreliable. Historically recorded as flowering in Oct, fruit in Feb and shed.



Growth (44 records with: Jan 0, Feb 11, Mar 0, Apr 0, May 2, Jun 2, Jul 7, Aug 6, Sep 5, Oct 0, Nov 10, Dec 1): Much from Nov to Feb; Rare from May and Nov; None from May to Nov. Peak levels unreliable at 100% in Dec.

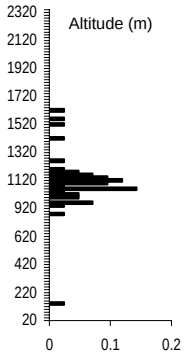


Seedlings (23 records): All without any seedlings present.
Fire Survival (5 records): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 100% at 9 years, no data from younger veld apart from 1 record of no flowers at 7 years.

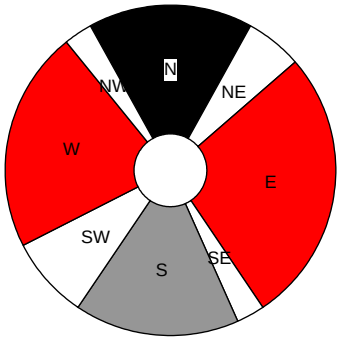


Height (44 records): 5% 0-0.2 m tall, 64% 0.2-1 m tall, 32% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (41 records): 100% inland - further than 2 km from coast.
Altitude (41 records): 760 - 1520 m; 940 $_{lq}$ - 960 $_{med}$ - 1000 $_{uq}$m.



Landform (41 records): 83% deep soil, 17% shallow soil.
Slope (41 records): 49% gentle incline, 32% steep incline, 12% platform, 5% valley bottom, 2% hill top.
Aspect (36 records): 33% East, 29% West, 21% South, 17% North.



Soil Type (41 records): 44% sandy, 22% loamy, 15% rocky, 12% clayey, 7% gravelly.
Soil Colour (41 records): 46% grey, 39% brown, 7% orange, 5% white, 2% red.
Geology (40 records): 68% sandstone, 28% shale, 3% silcrete or ferricrete, 3% Tertiary sands.
Vegetation (41 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Endangered A2a.
Occurrence (Fynbos): 414 km^2 with 28% conserved and 20% lost; Occupancy: 55km^2 with 33% conserved and 8% lost. Fragmentation index: 10%.
Nature Reserves (41 records): 39% in Nature Reserves.
Habitat destruction (41 records): 88% extensive natural habitat, 12% islands.
Alien Invasive Species (40 records): 43% *Pinus*, 38% none, 15% Fabaceae (chiefly alien *Acacia*), 5% *Hakea*.
Alien Density (40 records): 38% alien-free, 60% sparse, 3% abundant.

Cultivation & Utilization:
Picking (32 records): 100% no sign of picking.
Cultivation Status: Plantings - 1 record.

Atlassers Notes: None.

Confusing Species: Confused with *L. sessile* which has broader, hairy stems, broader

leaves, crowded involucral leaves and is often more branched and less erect.
Records of identification queries = 5.
Records of corrected identification queries = 3.

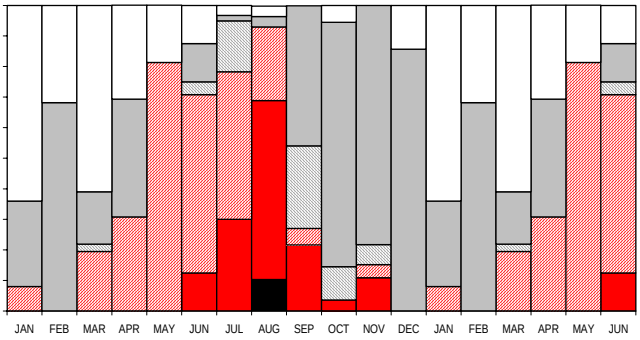
Variation and Taxonomy: Was considered *L. venosum* prior to being recognized as distinct. Strictly *venosum* is a synonym of *L. daphnoides*, but as the type was lost, it was in error applied to *L. sessile* from 1912 to the 1970s.
No variation noted.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDGYDO_m.jpg" * MERGEFORMAT \d

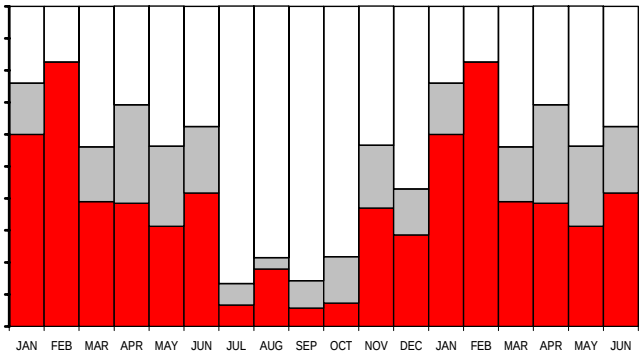
Leucadendron sessile R.Br. 1810
Western Sunbush
Kleinkoprosettolbos

Other Common Names: Baby-rosette Conebush, Mini-pompom Conebush, Sun Conebush, Venosum.
Other Scientific Names: *conchiforme* (Kuntze) 1898, *humifusum* Phill 1925.

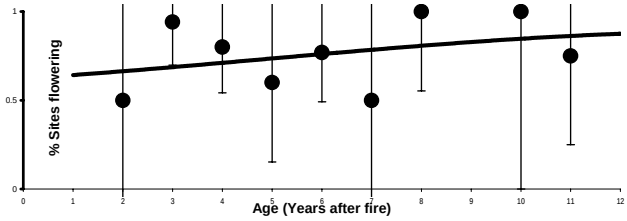
386 Records
Population (379 records): 30% Common, 56% Frequent, 14% Rare.
Dispersion (353 records): 76% variable, 20% clumped, 3% widespread.
Flowering (375 records with: Jan 25, Feb 22, Mar 41, Apr 13, May 16, Jun 24, Jul 60, Aug 29, Sep 37, Oct 55, Nov 46, Dec 7): Buds from Mar to Aug; Flowering from Jul to Sep; Peak Flowering not significant; Over from Sep; Fruit from Sep to Feb and Apr; Nothing from Jan to Apr. Peak levels at 95%(93%) in Jul (Aug). Historically recorded as flowering from Jul to Aug, fruit 4 months later, shed.



Growth (373 records with: Jan 25, Feb 23, Mar 41, Apr 13, May 16, Jun 24, Jul 60, Aug 28, Sep 35, Oct 55, Nov 46, Dec 7): Much from Nov to Jun; Rare from Apr to Jun and Nov; None from Mar to Jan. Peak levels at 83% in Feb.

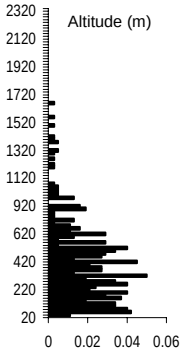


Seedlings (132 records): Absent in 97%: fewer seedlings than prefire adults in 2 cases. Seedlings found in Oct (2).
Fire Survival (20 records): 95% survived by seedlings only, 5% resprouted from underground boles.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 2-3 years, and 100% recorded at 8 years.

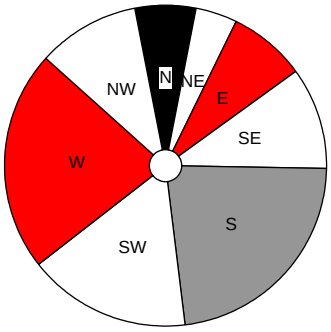


Height (382 records): 2% 0-0.2 m tall, 76% 0.2-1 m tall, 21% 1-2 m tall.
Pollinators (12 records): 58% beetles, 25% bees or wasps, 17% flies.
Detailed Pollinators (7 records): Monkey Beetle (3), Snout Weevil (2), Solitary Bee, Honey Bee.

Habitat:
Distance to Ocean (373 records): 76% inland - further than 2 km from coast.
Altitude (373 records): 20 - 1560 m; 180 $_{lq}$ - 320 $_{med}$ - 480 $_{uq}$m.



Landform (367 records): 74% deep soil, 20% shallow soil, 5% rocky outcrops.
Slope (369 records): 48% steep incline, 48% gentle incline, 2% hill top, 1% platform.
Aspect (355 records): 36% West, 35% South, 15% East, 14% North.



Soil Type (364 records): 33% loamy, 30% sandy, 16% gravelly, 14% clayey, 7% rocky.
Soil Colour (365 records): 68% brown, 18% grey, 10% orange, 2% red, 2% yellow.
Geology (354 records): 56% sandstone, 28% shale, 15% granite, 2% conglomerate.
Vegetation (370 records): 96% shrubland, 3% plantations.

Conservation Status and Threat:
Red Data List Status: Near Threatened B1b(i,ii)c(iv)2b(i,ii)c(iv).
Occurrence (Fynbos): 3 053 km^2 with 37% conserved and 28% lost; Occupancy: 265 km^2 with 20% conserved and 12% lost. Fragmentation index: 7%.
Nature Reserves (373 records): 51% in Nature Reserves - well conserved.
Habitat destruction (359 records): 93% extensive natural habitat, 5% islands, 1% road verges.

Alien Invasive Species (357 records): 32% none, 24% Fabaceae (chiefly alien *Acacia*), 22% *Pinus*, 17% *Hakea*, 4% Myrtaceae.
Alien Density (357 records): 32% alien-free, 52% sparse, 12% abundant, 3% dense.

Cultivation & Utilization:
Picking (244 records): 100% no sign of picking, 0.4% lightly picked.
Cultivation Status: Plantings - 4 records (1%).

Atlassers Notes:
Lots dead! Probably drought - little rain so far (AGR99072902); Lots dead (AGRY0031203); Dying (CFR99072902 + 3); A number of plants were dead (DJL99072904); Many dead and dying (IEB99072902); Some drought die-back (SMR99072904); Some patches of die–off (SMR99072906);
Inflorescences Often Seemed Aborted (SMR99072904);
Only on those in flower – Bees (CFR99072902); Pollinator : long thin dark fly (SMR99072911);
Doing OK in ploughed area! (ASP95051708);

Confusing Species: Often (62% of cases) confused with *L.tinctum*, which has green, strongly recurved involucral bracts, especially the larger plants to the south and in the vicinity of Sir Lowry's Pass. Also understandably confused with *L. daphnoides* (with adpressed involucral bracts and leaves), *gydoense* (with hairless stems and narrower leaves) and perhaps understandably with *glaberrimum subsp. erubescens* (which does not have brown, papery basal involucral bracts). Confusion with *L. gandogeri* and *rubrum* is less explicable, based on early records of non-flowering plants. Plate 170 and its description as *L. humifusum* in Flowering Plants of South Africa (1925) is *L. sessile* (Williams 1972).
Records of identification queries = 46.
Records of corrected identification queries = 26.

Variation and Taxonomy: From 1912 to 1972 this species was known as *L. venosum*, based on imperfect knowledge of the lost type, which is the same as *L. daphnoides*.
No variation noted.

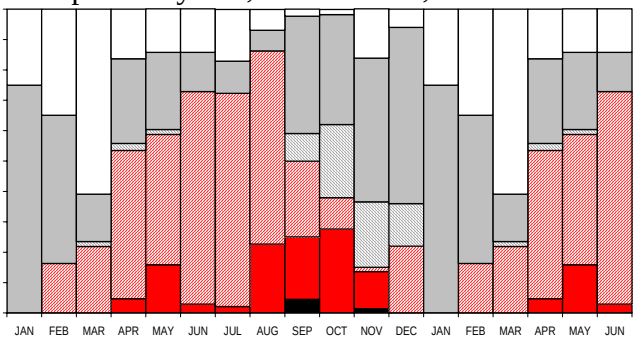
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSESS_m.jpg" * MERGEFORMAT \d

Leucadendron barkerae Williams 1967
Swartberg Conebush

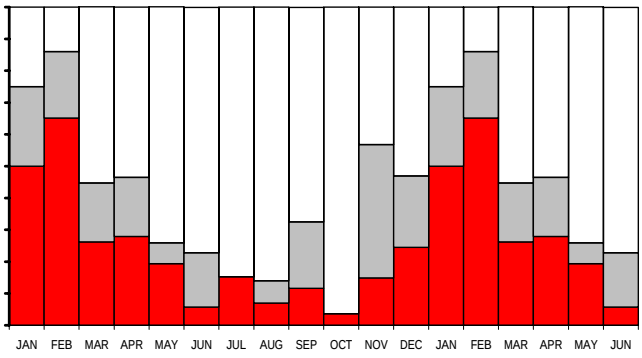
Other Common Names: None known.
Other Scientific Names: *None.*

620 Records

Population (613 records): 15% Common, 65% Frequent, 19% Rare.
Dispersion (565 records): 59% variable, 36% clumped, 3% widespread, 2% evenly distributed.
Flowering (608 records with: Jan 8, Feb 43, Mar 64, Apr 43, May 63, Jun 70, Jul 47, Aug 44, Sep 44, Oct 58, Nov 74, Dec 50): Buds from Mar to Sep and Dec; Flowering from Aug to Oct; Peak Flowering from not significant; Over from Oct to Nov; Fruit from Sep to Feb and Apr to May; Nothing from Jan toMar. Peak levels at 86% in Aug. Historically recorded as flowering from late Sep to early Oct, fruits in Dec, shed.



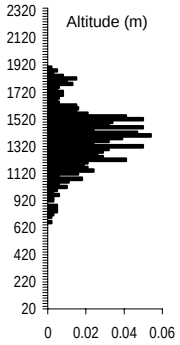
Growth (602 records with: Jan 8, Feb 43, Mar 65, Apr 43, May 62, Jun 70, Jul 46, Aug 43, Sep 43, Oct 56, Nov 74, Dec 49): Much from Dec to Apr; Rare from Nov to Feb and Sep; None from Mar to Jan. Peak levels at 86% in Feb.



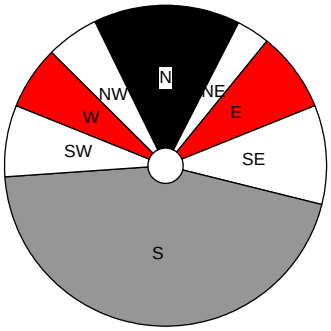
Seedlings (187 records): Absent in 99%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jul.
Fire Survival (22 records): 45% escaped fires in fire-safe areas, 36% survived by seedlings only, 9% eliminated from the area by fires, 9% resprouted from underground boles.
Age to first flowering: First flowers recorded at 3 years, 50% estimated at 5-6 years, and 100% estimated at 13 years, with some evidence of senescence after 21 years.

Height (610 records): 1% 0-0.2 m tall, 60% 0.2-1 m tall, 38% 1-2 m tall.
Pollinators (6 records): 67% beetles, 17% butterflies or moths, 17% bees or wasps.
Detailed Pollinators (2 records): Solitary Bee, Heady Maiden Moth.

Habitat:
Distance to Ocean (615 records): 100% inland - further than 2 km from coast.
Altitude (615 records): 640 - 1800 m; 1120 *lq* - 1280 *med* - 1380 *uq*m.



Landform (615 records): 64% shallow soil, 33% deep soil, 3% rocky outcrops.
Slope (615 records): 50% steep incline, 39% gentle incline, 7% hill top, 3% platform, 1% cliff.
Aspect (554 records): 54% South, 19% North, 14% East, 13% West.



Soil Type (614 records): 52% sandy, 20% loamy, 17% rocky, 9% gravelly, 1% clayey, 0.3% peaty.
Soil Colour (607 records): 53% brown, 32% grey, 6% orange, 4% black, 2% yellow, 1% white, 1% red.
Geology (604 records): 93% sandstone, 6% shale, 0.2% conglomerate, 0.2% silcrete or ferricrete, 0.2% Tertiary sands.
Vegetation (612 records): 100% shrubland, 0.3% grassland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 3 515 km^2 with 25% conserved and 1% lost; Occupancy: 642 km^2 with 25% conserved and 1% lost. Fragmentation index: 6%.
Nature Reserves (615 records): 36% in Nature Reserves.

Habitat destruction (587 records): 98% extensive natural habitat, 1% naturally linear habitats.
Alien Invasive Species (580 records): 92% none, 6% *Pinus*, 1% *Hakea*, 1% Fabaceae (chiefly alien *Acacia*).
Alien Density (567 records): 94% alien-free, 6% sparse.

Cultivation & Utilization:
Picking (513 records): 99% no sign of picking, 0.6% lightly picked.
Cultivation Status: Plantings - 1 record.

Atlassers Notes:
With features very reminiscent of L. burchellii (NAH92051601, NAH94042301, NAH97030202); Odd population similar to those collected by Rebelo et al on Bonteberg with recurved involucral (outer series) bracts esp in male and with very few cilia on margins: L. "*touwsrivierenses*." Specimen in NBG herbarium (NAH # 1626) (NAH98102404; First Encounter with putative *L. burchellii* recorded in NAH92051601 (SHR93080803); With leaves like *L. burchellii* but basal bracts of flowers are not recurved and flowerheads are partially enclosed by involucral leaves - attributes of L. barkerae. Follow-up to NAH92051601- herbarium specimen (male & female) taken (Richardson # 2 NBG) (SHR93080804);

Most dead (originally over 12 plants) - only males remain (AGRY0031828); Half plants in part of plot dead (AGRY0031915); 2 senescent males in rocks (AKS95111405); Only 1 plant seen on this site & in area nearby (EGH94071305); Burnt bush seen (EGH94071403); Very sick plant (OUT95061802); Also several dead (drought?) (SMRY0021106); Poor condition (WMPY0031903);
Yellow spider in flowerhead (ASP94100904);
Seen in an area roughly 2 km x 2 km but may occupy much of the s facing Witwaterskloof area (NAH92051601);

Confusing Species: Confused with several members of the Stigmatic Sun Conebushes, *L. tinctum* (55% of queries), *L. burchellii* (12% - all from the western Langeberg – see atlassers notes), *L. cordatum* (18% - all from the Groot Swartberg around Swartberg Pass) and *L. pubibracteolatum*, although several atlassers declined to identify the species below the Stigmatic Sun Conebushes (8%). Two instances misidentification with *L. pubescens* were also noted. In the bud stage it is unmistakable, most resembling *L. daphnoides* (which is not a Stigmatic Sun Conebush).
Records of identification queries = 94.
Records of corrected identification queries = 49.

Variation and Taxonomy: Williams notes that there is a lack of variation, but the populations form the western Langeberg need to be critically evaluated.
Williams noted that this was the only Conebush with toothed leaves, but these are sporadic: atlassers have also found toothed leaves in *L. rubrum*.

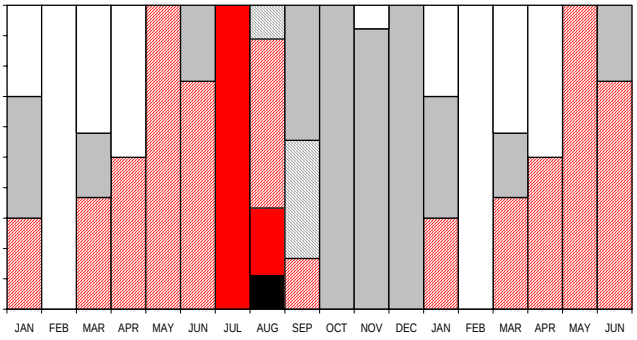
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDBARK_m.jpg" * MERGEFORMAT \d

Leucadendron burchellii Williams 1972
Riviersonderend Conebush

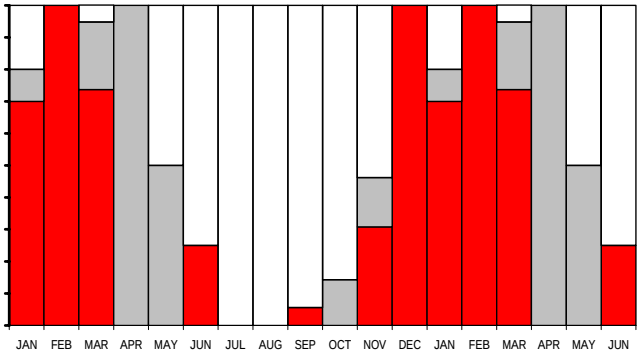
Other Common Names: None known.
Other Scientific Names: *None.*

90 Records

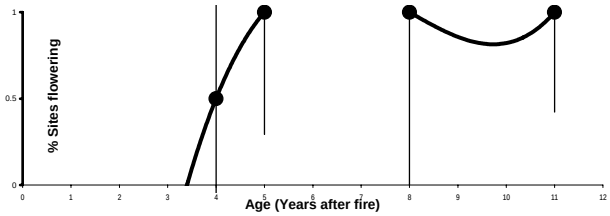
Population (89 records): 29% Common, 53% Frequent, 18% Rare.
Dispersion (77 records): 70% variable, 29% clumped, 1% widespread.
Flowering (88 records with: Jan 10, Feb 1, Mar 19, Apr 2, May 2, Jun 4, Jul 1, Aug 9, Sep 18, Oct 7, Nov 13, Dec 2): Buds from Jan to Jun and Aug; Flowering from Jul to Aug; Peak Flowering not significant in Aug; Over from Sep; Fruit from Sep to Jan, Mar and Jun; Nothing from Jan to Apr. Peak levels unreliable at 100% in Aug. Historically recorded as flowering in Aug, fruits in Dec, shed.



Growth (88 records with: Jan 10, Feb 1, Mar 19, Apr 2, May 2, Jun 4, Jul 1, Aug 9, Sep 18, Oct 7, Nov 13, Dec 2): Much from Nov to Mar and Jun; Rare from Mar to May; None from May to Jan. Peak levels unreliable at 100% in Dec and Feb.

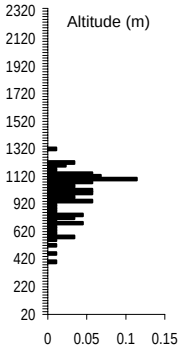


Seedlings (42 records): All without any seedlings present.
Fire Survival (1 record): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 4 years, 50% estimated at 4 years, and 100% recorded at 5 years.

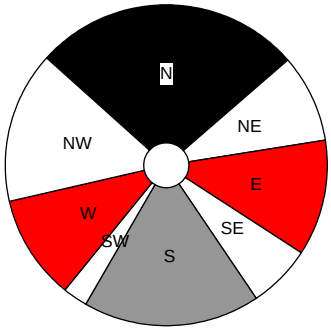


Height (89 records): 1% 0-0.2 m tall, 69% 0.2-1 m tall, 30% 1-2 m tall.
Pollinators (2 records): 100% beetles.
Detailed Pollinators (1 record): Snout Weevil.

Habitat:
Distance to Ocean (87 records): 100% inland - further than 2 km from coast.
Altitude (87 records): 380 - 1220 m; 720 *lq* - 900 *med* - 980 *uq*m.



Landform (86 records): 81% deep soil, 14% shallow soil, 5% rocky outcrops.
Slope (85 records): 62% gentle incline, 25% steep incline, 9% platform, 4% hill top.
Aspect (77 records): 42% North, 23% South, 19% East, 16% West.



Soil Type (84 records): 55% sandy, 20% loamy, 17% gravelly, 4% clayey, 2% peaty, 2% rocky.
Soil Colour (84 records): 50% grey, 31% brown, 8% white, 7% orange, 2% black, 1% yellow.
Geology (84 records): 93% sandstone, 7% shale.
Vegetation (85 records): 98% shrubland, 1% thicket, 1% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Near Threatened D2(i).
Occurrence (Fynbos): 345 km^2 with 36% conserved and 0% lost; Occupancy: 65 km^2 with 19% conserved and 1% lost. Fragmentation index: 11%.
Nature Reserves (87 records): 8% in Nature Reserves - inadequately conserved.
Habitat destruction (84 records): 94% extensive natural habitat, 4% islands, 2% naturally linear habitats.
Alien Invasive Species (86 records): 49% none, 33% *Hakea*, 17% *Pinus*, 1% Fabaceae (chiefly alien *Acacia*).
Alien Density (86 records): 49% alien-free, 48% sparse, 2% abundant, 1% impenetrable.

Cultivation & Utilization:

Picking (70 records): 96% no sign of picking, 3% lightly picked, 1% severely picked.
Cultivation Status: Plantings - 1 record, Augmentations - 1 record.

Atlassers Notes:
Remnants of planted field? - no probably natural (AWA97100704); Some look remnants of planted field, others definitely spread by some means or other - probably natural (AWA97100705); May be planted - possible but unlikely (SHR95011406); Some planted some natural (SMR99092901); Population has been reduced by further ploughing and planting of *Protea compacta* and *L. platyspermum* varieties (SHR97101606);

Confusing Species: Most often confused with *L. tinctum* (90%), which has spreading involucral leaves, oily basal bracts and hairless male perianth. Two records of confusion with *L. daphnoides*, but not in flowering stages.
Records of identification queries = 34.
Records of corrected identification queries = 26.

Variation and Taxonomy: No variation known. Prior to Williams was only collected by Burchell in 1815.
Williams noted the gnawing of seedheads by rodents keen to get the fruit.

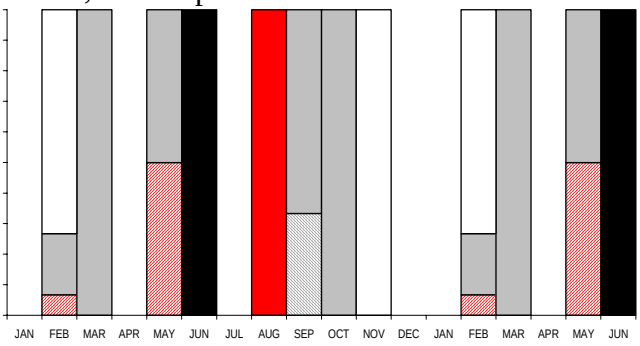
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDBURC_m.jpg" * MERGEFORMAT \d

Leucadendron cordatum Phill. 1917 *Langeberg form*
Langeberg Droopy Conebush
Bergkatjiepiering

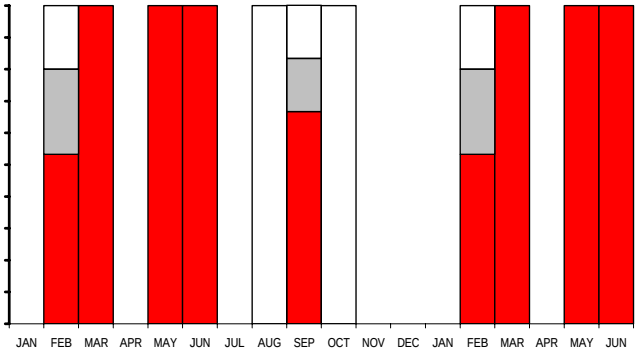
Other Common Names: None known.
Other Scientific Names: *None.*

38 Records

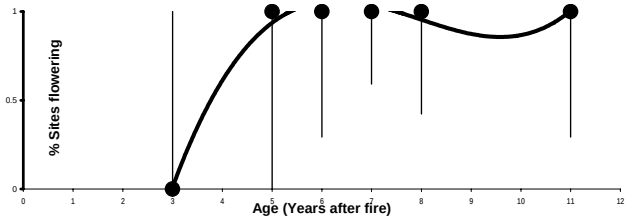
Population (38 records): 45% Common, 32% Frequent, 21% Rare, 3% Extinct.
Dispersion (34 records): 65% clumped, 32% variable, 3% widespread.
Flowering (37 records with: Jan 0, Feb 15, Mar 3, Apr 0, May 6, Jun 1, Jul 0, Aug 3, Sep 6, Oct 2, Nov 1, Dec 0): Buds from May; Flowering from Aug; Peak Flowering from Jun; Over from Sep; Fruit from Feb to May and Sep to Oct; Nothing from Nov to Feb. Peak levels unreliable at 100% in Jun and Aug. Historically recorded as flowering in Jun, fruits ripen 4 months later and are shed.



Growth (36 records with: Jan 0, Feb 15, Mar 3, Apr 0, May 6, Jun 1, Jul 0, Aug 3, Sep 6, Oct 2, Nov 0, Dec 0): Much from Feb to Jun and Sep; Rare from Feb; None from Aug and Oct. Peak levels unreliable at 100% from Mar to Jun.

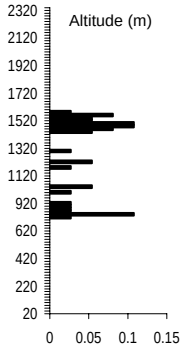


Seedlings (8 records): Absent in 75%: more seedlings than prefire adults in 1 case. Seedlings found in Nov.
Fire Survival (1 record): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 4 years, 50% estimated at 3-4 years, and 100% recorded at 5 years.

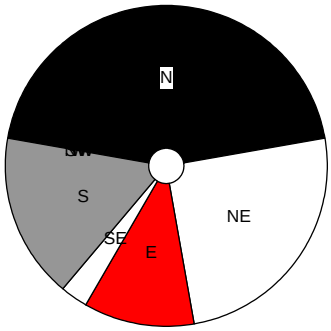


Height (36 records): 14% 0-0.2 m tall, 86% 0.2-1 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (37 records): 100% inland - further than 2 km from coast.
Altitude (37 records): 700 - 1480 m; 880 *lq* - 1340 *med* - 1380 *uq*m.



Landform (37 records): 78% deep soil, 11% rocky outcrops, 11% shallow soil.
Slope (37 records): 59% gentle incline, 30% steep incline, 8% hill top, 3% platform.
Aspect (36 records): 54% North, 28% East, 18% South.



Soil Type (36 records): 81% sandy, 11% loamy, 8% gravelly.
Soil Colour (36 records): 50% grey, 39% brown, 8% yellow, 3% white.
Geology (36 records): 89% sandstone, 11% shale.
Vegetation (36 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Near Threatened D2(i).
Occurrence (Fynbos): 158 km^2 with 11% conserved and 8% lost; Occupancy: 49 km^2 with 8% conserved and 8% lost. Fragmentation index: 16%.
Nature Reserves (37 records): 19% in Nature Reserves - inadequately conserved.
Habitat destruction (35 records): 94% extensive natural habitat, 3% road verges, 3% naturally linear habitats.
Alien Invasive Species (37 records): 65% none, 27% *Pinus*, 3% Fabaceae (chiefly alien *Acacia*), 3% Myrtaceae, 3% other aliens.
Alien Density (37 records): 65% alien-free, 35% sparse.

Cultivation & Utilization:
Picking (34 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Many plants are over 1 m (VJK94060504);
It is difficult to distinguish male & female plants: male flowerheads are yellow to red and are more matured; involucral bracts much larger. Female flowerheads green to yellow. 1 male bright pine–yellow (VJK94060504);
Sprawled well below the dominant of the thick vegetation - it was difficult to see even with the dramatic flowers - I'm sure there were many more of them (SMR99080703);
Apparently in area according to Peter Slingsby's map (WIJ93102801);

Confusing Species: None noted.
Records of identification queries = 2.

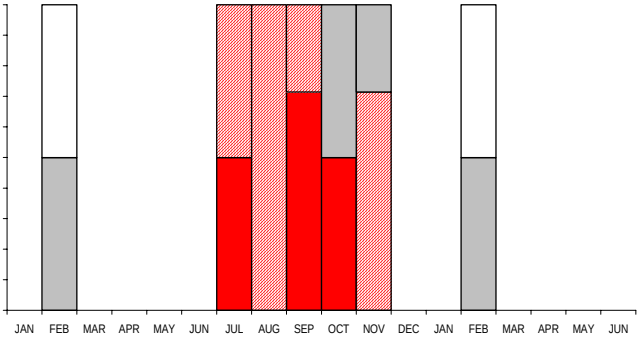
Variation and Taxonomy: Shrubs from Koo are decumbent, whereas those from Montagu, Bovlakte and Sarahsrivier are erect.
The largest and broadest involucral leaves are at Montagu.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDCORDL_m.jpg" * MERGEFORMAT \d

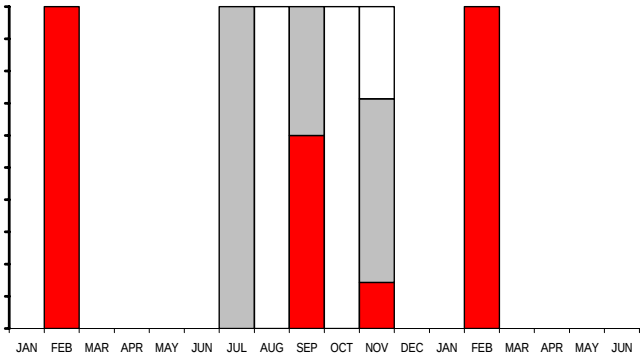
Leucadendron cordatum Phill. 1917 *Swartberg form*
Swartberg Droopy Conebush
Bergkatjiepiering

Other Common Names: None known.
Other Scientific Names: *humifusum* E.Mey. in Drege *1844, ovale* var. *humifusum* Meisn. 1856.

27 Records
Population (26 records): 4% Common, 81% Frequent, 15% Rare.
Dispersion (25 records): 36% variable, 36% clumped, 28% evenly distributed.
Flowering (26 records with: Jan 0, Feb 4, Mar 0, Apr 0, May 0, Jun 0, Jul 2, Aug 4, Sep 7, Oct 2, Nov 7, Dec 0): Buds from Jul to Sep and Nov; Flowering from Jul and Sep to Oct; Peak Flowering and Over not recorded; Fruit from Oct to Feb; Nothing from Feb. Peak levels unreliable at 100% from Jul to Sep. Historically recorded as flowering from Jun to Jul, fruit ripen after 4-5 months and are shed.



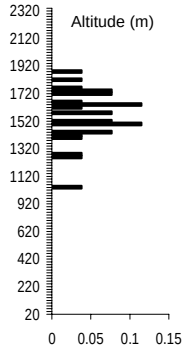
Growth (21 records with: Jan 0, Feb 2, Mar 0, Apr 0, May 0, Jun 0, Jul 2, Aug 4, Sep 5, Oct 1, Nov 7, Dec 0): Much from Feb and Sep; Rare from Jul, Sep and Nov; None from Aug and Oct to Nov. Peak levels unreliable at 100% in Feb.



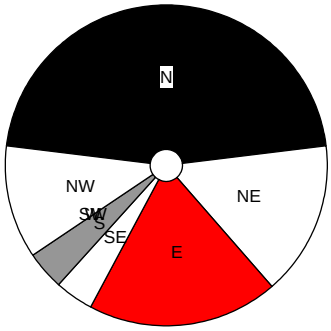
Seedlings (9 records): All without any seedlings present.
Fire Survival : No data.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% estimated at 7 years.

Height (25 records): 16% 0-0.2 m tall, 84% 0.2-1 m tall.
Pollinators (1 record): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (26 records): 100% inland - further than 2 km from coast.
Altitude (26 records): 920 - 1780 m; 1320 *lq* - 1420 *med* - 1540 *uq*m.



Landform (25 records):
48% deep soil,
44% shallow soil,
8% rocky outcrops.
Slope (26 records): 54% steep incline, 46% gentle incline.
Aspect (26 records): 60% North, 27% East, 8% South, 6% West.



Soil Type (24 records):
38% sandy,
25% gravelly,
21% rocky,
13% loamy,
4% clayey.
Soil Colour (25 records):
52% grey,
48% brown.
Geology (25 records): 92% sandstone, 8% shale.
Vegetation (26 records): 85% shrubland, 15% wooded grassland.

Conservation Status and Threat:
Red Data List Status: Near Threatened D2(i,ii).
Occurrence (Fynbos): 258 km^2 with 90% conserved and 1% lost; Occupancy: 52 km^2 with 83% conserved and 1% lost. Fragmentation index: 18%.
Nature Reserves (26 records): 65% in Nature Reserves - well conserved.
Habitat destruction (25 records): 96% extensive natural habitat, 4% islands.
Alien Invasive Species (21 records): 95% none, 5% *Pinus*.
Alien Density (21 records): 95% alien-free, 5% sparse.

Cultivation & Utilization:
Picking (17 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes: None, other than notes on hybrids and confusion with *L. tinctum*.

Confusing Species: Confused with *L. tinctum*, but mainly when not in flower. In flower the heads of *L. tinctum* are erect, whereas in *L. cordatum* they are drooping; he leaves of *L. tinctum* are more oblong (*versus* broadly elliptic).
Plate 170 and its description as *L. humifusum* in Flowering Plants of South Africa (1925) is *L. sessile* (Williams 1972).

Records of identification queries = 14.
Records of corrected identification queries = 7.

Variation and Taxonomy: The populations from Klaarstroom are decumbent.

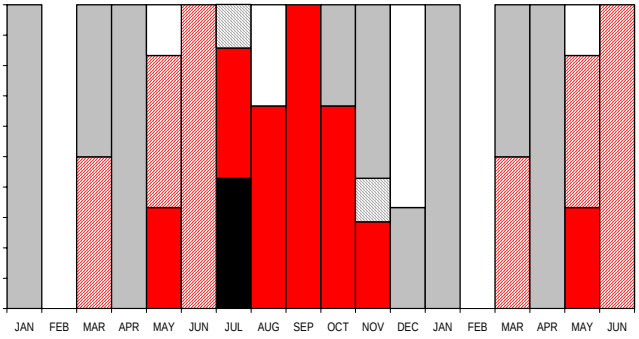
Distribution: Add.
Check record from Rooiberg?

INCLUDEPICTURE
"C:\\temp\\atlas\\LDCORDS_m.jpg" *
MERGEFORMAT \d

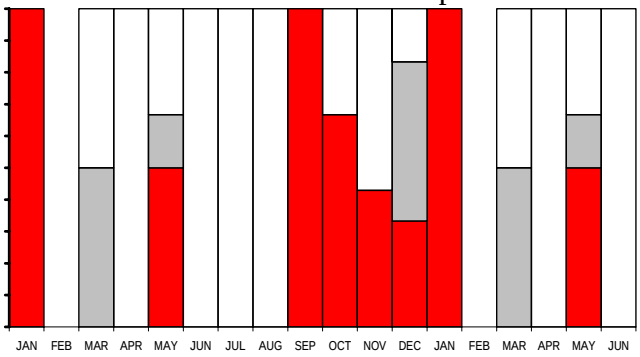
Leucadendron orientale Williams 1972
Van Staden's Sunbush
Gouerosettolbos

Other Common Names: Golden-rosette Conebush, Oriental Conebush, Van Staden's Conebush, *Scented Petals.*
Other Scientific Names: *None.*

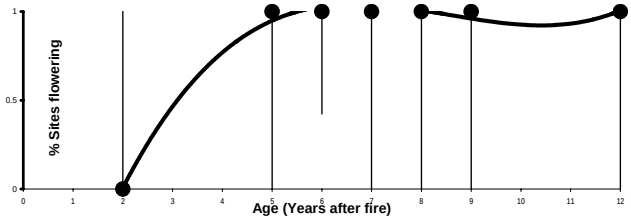
38 Records
Population (34 records): 35% Common, 47% Frequent, 18% Rare.
Dispersion (32 records): 66% clumped, 31% variable, 3% evenly distributed.
Flowering (38 records with: Jan 1, Feb 0, Mar 2, Apr 1, May 6, Jun 1, Jul 7, Aug 3, Sep 1, Oct 3, Nov 7, Dec 6): Buds from Mar and May to Jun; Flowering from May to Nov; Peak Flowering from Jul; Over not significant; Fruit from Oct to Apr; Nothing from Aug and Dec. Peak levels unreliable at 100% in Jul. Historically recorded as flowering from late Jun and Jul, fruit in Nov, shed.



Growth (38 records with: Jan 1, Feb 0, Mar 2, Apr 1, May 6, Jun 1, Jul 7, Aug 3, Sep 1, Oct 3, Nov 7, Dec 6): Much from Sep to Jan and May; Rare from Mar, May and Dec; None from Mar to Aug and Oct to Nov. Peak levels unreliable at 100% in Sep and Jan.

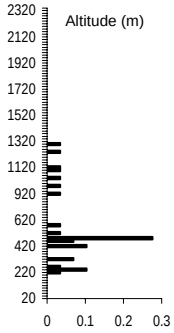


Seedlings (27 records): Absent in 93%: more seedlings than prefire adults in 1 case. Seedlings found in May.
Fire Survival (3 records): 67% survived by seedlings only, 33% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 5 years, 50% estimated at 3-4 years, and 100% recorded at 5 years.

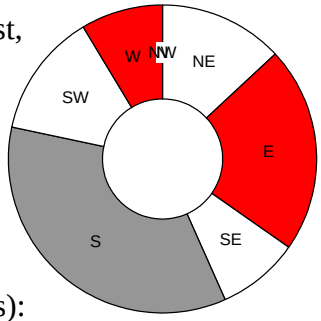


Height (38 records): 5% 0-0.2 m tall, 66% 0.2-1 m tall, 29% 1-2 m tall.
Pollinators (3 records): 33% bees or wasps, 33% flies, 33% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (26 records): 100% inland - further than 2 km from coast.
Altitude (26 records): 200 - 1200 m; 400 *lq* - 480 *med* - 480 *uq* m.



Landform (26 records): 81% deep soil, 19% shallow soil.
Slope (26 records): 50% gentle incline, 19% steep incline, 15% hill top, 15% platform.
Aspect (20 records): 50% South, 33% East, 13% West, 5% North.



Soil Type (25 records): 60% loamy, 32% sandy, 4% clayey, 4% gravelly.
Soil Colour (25 records): 60% grey, 36% brown, 4% orange.
Geology (26 records): 92% sandstone, 4% shale, 4% silcrete or ferricrete.
Vegetation (26 records): 96% shrubland, 4% grassland.

Conservation Status and Threat:
Red Data List Status: Endangered B1a(i)b(i,ii,iii,iv,v)c(iv) + 2a(i)b(i,ii,iii,iv,v)c(iv).
Occurrence (Fynbos): 592 km^2 with 50% conserved and 29% lost; Occupancy: 43 km^2 with 52% conserved and 10% lost. Fragmentation index: 7%.
Nature Reserves (26 records): 73% in Nature Reserves - well conserved.
Habitat destruction (25 records): 84% extensive natural habitat, 16% islands.
Alien Invasive Species (24 records): 38% *Pinus*, 33% none, 17% Fabaceae (chiefly alien *Acacia*), 8% *Hakea*, 4% Myrtaceae.

Alien Density (24 records): 33% alien-free, 54% sparse, 8% abundant, 4% dense.

Cultivation & Utilization:
Picking (31 records): 100% no sign of picking.
Cultivation Status: Plantings - 2 records (5%), Escapes - 1 record (3%).

Atlassers Notes:
Stand is very healthy but small in extent (DFJ97111604);
12 plants seen: area in firebelt for nature reserve. Needs reserve to be moved and a two-tier fire belt (6-8 yr rotation) installed (AGRY0070442);
One plant growing on a grave: I presume the seed came from a boquet or wreath on the grave plants 3-4 years old origin of seed unknown - confirmation of plant requested by Tony - how did he see it going past at 120 km on the freeway? (GNIY0072101);
I don't think these have been atlassed before- they have been completely overgrown and hidden in wattles. These are being cleared and a fire exposed them more and they are now growing well (MCGY1111101);

Confusing Species: Confused with *L. pubibracteolatum* (but has more erect leaves, and involucral leaves closely clasping the base of the heads) and *L. conicum* (which is totally different). Prior to 1972 specimens were classified as either *L. daphnoides* or *L. tinctum*.
Records of identification queries = 5.
Records of corrected identification queries = 4.

Variation and Taxonomy: No variation noted.

Distribution: Add.
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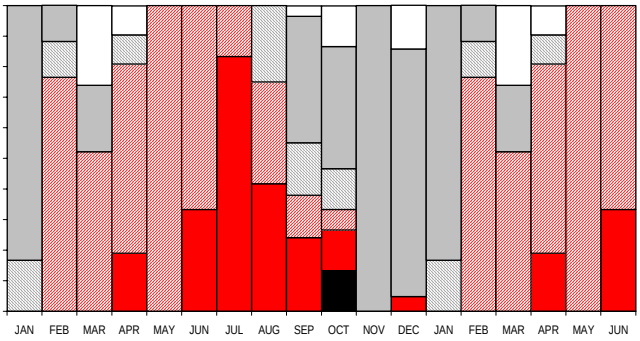
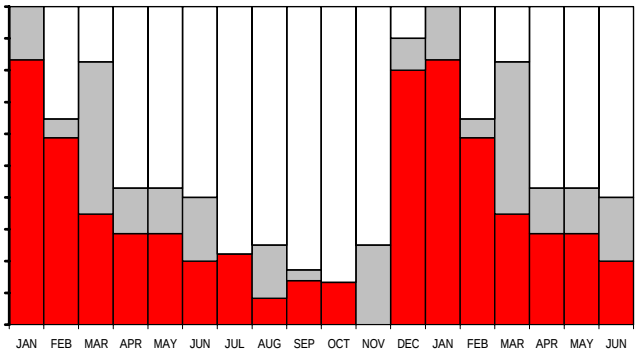
Leucadendron pubibracteolatum Williams 1972
Purple-leaf Conebush

Other Common Names: Golden Rose Conebush, Golden-leaf Conebush, Grandiflorum, *Begrafnisblom.*
Other Scientific Names: *None.*

177 Records
Population (173 records): 9% Common, 63% Frequent, 28% Rare.
Dispersion (159 records): 47% clumped, 43% variable, 6% evenly distributed, 4% widespread.
Flowering (174 records with: Jan 6, Feb 17, Mar 23, Apr 21, May 8, Jun 6, Jul 12, Aug 12, Sep 29, Oct 15, Nov 4, Dec 21): Buds from Feb to Jun and Aug; Flowering from Jun to Sep; Peak Flowering not significant; Over from Aug; Fruit from Sep to Jan and Mar; Nothing from Mar. Peak levels at 100% in Jul. Historically recorded as flowering from late Jul and early Aug, fruits Nov, shed.



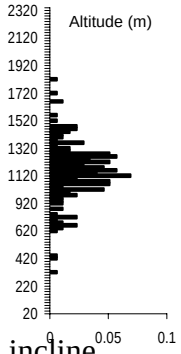
Growth (168 records with: Jan 6, Feb 17, Mar 23, Apr 21, May 7, Jun 5, Jul 9, Aug 12, Sep 29, Oct 15, Nov 4, Dec 20): Much from Dec to Jul; Rare from Mar, Jun and Nov; None from Feb and Apr to Nov. Peak levels at 100% in Jan.



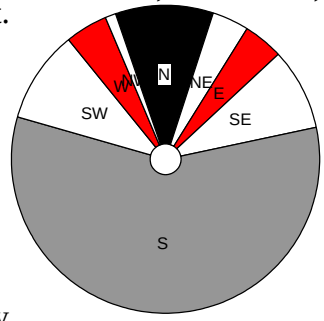
Seedlings (88 records): Absent in 93%: fewer seedlings than prefire adults in 2 cases, and more in 1 case. Seedlings found in Oct (2) and Dec.
Fire Survival (10 records): 70% survived by seedlings only, 20% eliminated from the area by fires, 10% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2 years, and 100% recorded at 4 years.

Height (171 records): 5% 0-0.2 m tall, 43% 0.2-1 m tall, 51% 1-2 m tall, 1% 2-5 m tall.
Pollinators (3 records): 67% beetles, 33% bees or wasps.
Detailed Pollinators (2 records): Solitary Bee, Snout Weevil.

Habitat:
Distance to Ocean (175 records): 100% inland - further than 2 km from coast.
Altitude (175 records): 300 - 1720 m; 940 $_{lq}$ - 1040 $_{med}$ - 1120 $_{uq}$m.



Landform (174 records): 49% deep soil, 45% shallow soil, 6% rocky outcrops.
Slope (174 records): 47% gentle incline, 46% steep incline, 3% hill top, 2% cliff, 2% platform.
Aspect (164 records): 68% South, 13% North, 9% East, 9% West.



Soil Type (171 records): 44% sandy, 28% loamy, 20% rocky, 5% gravelly, 1% clayey, 1% peaty.
Soil Colour (172 records): 47% grey, 41% brown, 9% black, 2% orange.
Geology (173 records): 96% sandstone, 4% shale.
Vegetation (174 records): 99% shrubland.

Conservation Status and Threat:
Red Data List Status: Near Threatened B2a(i)c(iv).
Occurrence (Fynbos): 7 679 km^2 with 36% conserved and 9% lost; Occupancy: 277 km^2 with 53% conserved and 3% lost. Fragmentation index: 3%.
Nature Reserves (175 records): 58% in Nature Reserves - well conserved.
Habitat destruction (155 records): 96% extensive natural habitat, 2% naturally linear habitats, 1% islands.
Alien Invasive Species (150 records): 82% none, 11% *Hakea*, 5% *Pinus*, 3% Fabaceae (chiefly alien *Acacia*).

Alien Density (149 records): 83% alien-free, 15% sparse, 2% abundant.

Cultivation & Utilization:
Picking (113 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Male plants only (RDF95090902); Only 1 male plant next to road female 30m down slope more plants 100m further west on the track down hill (RDF94112605);
Quite A Few Dead Plants (WMP97092401+05);

Confusing Species: Frequently confused (69% of cases) with *L. tinctum*, especially the western-most populations. It differs in having the male floral bract hairy and not glabrous, a ridged perimeter to the fruit and a broad based cone with bracts recurved but standing fairly erect. It is also more of an erect plant than *L. tinctum*, and has a purplish hue. The two are clearly closely related. Other errors include *L. barkerae, L. cordatum* and *L. orientale,* all members of the Stigmatic Sun Conebushes, but none with open (not clasping), erect involucral bracts.
Records of identification queries = 63.
Records of corrected identification queries = 26.

Variation and Taxonomy: There is subtle variation, mostly that plants in the west approach *L. tinctum* in giss. Specifically, the westernmost population progressively lose the diagnostic features, with the exception of the hairy male floral bract, which thus remains the diagnostic feature for the species as defined by Williams. Previous to 1972 this was considered to be *L. tinctum*.

Distribution: Add.
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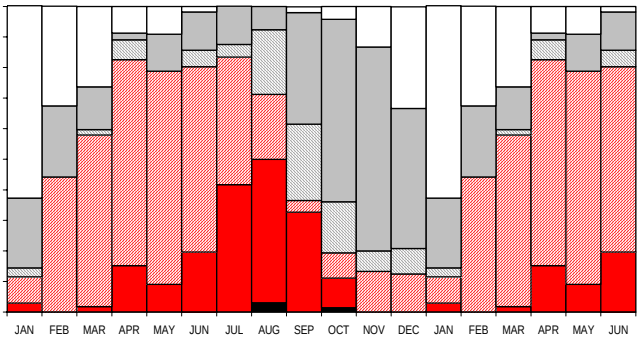
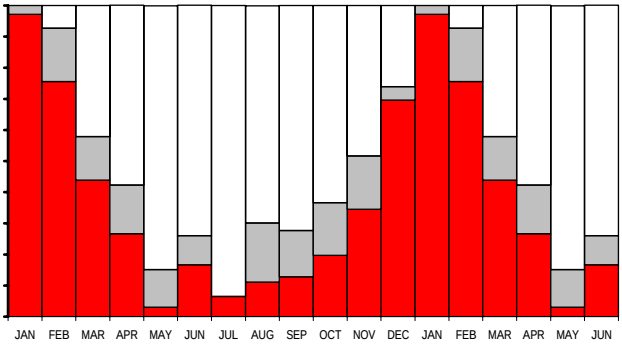
Leucadendron tinctum Williams 1968
Spicy Conebush
Toffeeappel

Other Common Names: Daphnoides, Grandiflorum, Lollypop, Mountain Rose, Painted-rosette Conebush, Rose Cockade, *Bergkatjiepiering, Bergroos.*
Other Scientific Names: *conchiforme* (Kuntze) 1898, *humifusum* E.Mey. 1844.

579 Records
Population (543 records): 20% Common, 60% Frequent, 19% Rare.
Dispersion (501 records): 52% variable, 36% clumped, 7% evenly distributed, 5% widespread.
Flowering (562 records with: Jan 35, Feb 43, Mar 57, Apr 46, May 33, Jun 56, Jul 48, Aug 66, Sep 52, Oct 72, Nov 30, Dec 24): Buds from Feb to Aug; Flowering from Jun to Sep; Peak Flowering not significant; Over from Aug to Sep; Fruit from Sep to Feb; Nothing from Dec to Mar. Peak levels at 92% in Aug. Historically recorded as flowering in July at lower altitudes, but somewhat later inland and at higher altitudes, fruit ripen and fall 3 months later.

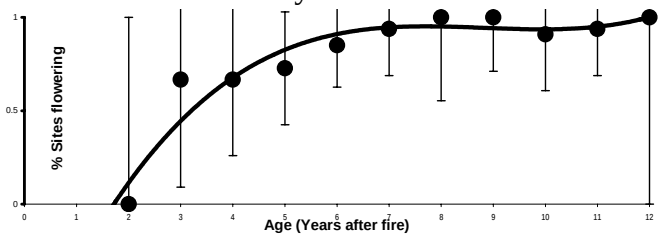


Growth (545 records with: Jan 36, Feb 41, Mar 57, Apr 45, May 33, Jun 54, Jul 46, Aug 63, Sep 47, Oct 71, Nov 29, Dec 23): Much from Oct to Apr; Rare not significant; None from Mar to Dec. Peak levels at 100% in Jan.



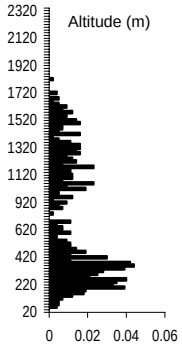
Seedlings (261 records): Absent in 94%: fewer seedlings than prefire adults in 7 cases, and more in 1 case. Seedlings found in Feb (2), Apr, Jun, Jul, Aug (2)and Sep.
Fire Survival (19 records): 47% survived by seedlings only, 32% eliminated from the area by fires, 16% escaped fires in fire-safe areas, 5% resprouted from underground boles.

Age to first flowering: First flowers recorded at 3 years, 50% estimated at 2-3 years, and 100% recorded at 8 years.

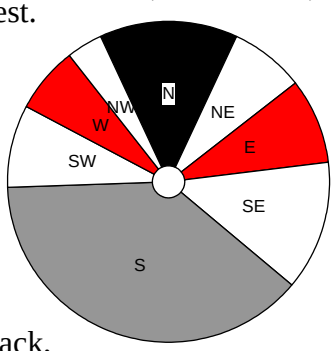


Height (561 records): 3% 0-0.2 m tall, 57% 0.2-1 m tall, 40% 1-2 m tall.
Pollinators (3 records): 67% bees or wasps, 33% flies.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (540 records): 95% inland - further than 2 km from coast.
Altitude (540 records): 40 - 1720 m; 280 $_{lq}$ - 480 $_{med}$ - 1060 $_{uq}$m.



Landform (531 records): 57% deep soil, 38% shallow soil, 5% rocky outcrops.
Slope (530 records): 46% gentle incline, 45% steep incline, 6% hill top, 1% platform.
Aspect (492 records): 51% South, 19% North, 18% East, 12% West.



Soil Type (530 records): 53% sandy, 26% loamy, 10% rocky, 8% gravelly, 3% clayey.
Soil Colour (530 records): 44% grey, 42% brown, 5% black, 4% orange, 2% yellow, 2% white.
Geology (527 records): 91% sandstone, 8% shale.
Vegetation (536 records): 98% shrubland, 1% plantations.

Conservation Status and Threat:
Red Data List Status: Near Threatened A4c.
Occurrence (Fynbos): 9 150 km^2 with 25% conserved and 18% lost; Occupancy: 712 km^2 with 44% conserved and 13% lost. Fragmentation index: 3%.
Nature Reserves (540 records): 56% in Nature Reserves - well conserved.
Habitat destruction (516 records): 95% extensive natural habitat, 2% islands, 1% naturally linear habitats.

Alien Invasive Species (503 records): 51% none, 21% *Pinus*, 14% Fabaceae (chiefly alien *Acacia*), 11% *Hakea*, 2% Myrtaceae.
Alien Density (493 records): 52% alien-free, 36% sparse, 9% abundant, 2% dense.

Cultivation & Utilization:
Picking (438 records): 97% no sign of picking, 3% lightly picked, 0.2% severely picked.
Cultivation Status: Plantings - 20 records (3%), Escapes - 8 records (1%).

Atlassers Notes:
1.8 m tall (TJB94010604);
Longer thinner leaves than normal (AGR97022413); More like L. pubibracteatum in colour and habit - only one female seen (AGRY2053033); I am not happy that this is a true blue *L. tinctum* - it has so many features that are *L. pubibracteolatum* starting with the altitude where it grows the bushes are sparsely leaved 1/2 the branches are bare leaves towards extremity leaves grey green, etc. (VJK98110105);
John Oaks says that these were planted and have escaped (AGR92103106, JAT94090303); Planted or escapees from the houses upslope (APE92100413); Probably escaped from local nature park where they were planted many years ago (JOA92110301); Occurred outside the garden of Erf 547 (protea garden) & not in the area where a lot of seedlings came up after the 1983 fire - but could have come from a cultivated plant - I will look out for others further away (YDA92060801);
1/2 plants dead ((AGR93050503+04)); Two of the plants were dead (SHR91092101);
31 Plants (TJB94010604); So far we have only found one population with 500 plants - will continue to look for more - site 97 has 876 plants (VJK93101002); Site 382 has 6 plants (VJK97100403); We were most interested to read in Sasol proteas that it grows here in Gysmanshoek Pass so decided to find them: so far we have only found one population - they grow in a strip 125x70 m. Jean counted 125 through length of patch and I counted 70 (VJK97100403);

Confusing Species: Considerable confusion was caused in 1912 by Phillips and Hutchinson regarding this as a synonym of *L. grandiflorum*, which is totally unrelated, an error only rectified in 1968. Atlassers confused this species with *L. pubibracteolatum* (42% of cases, which has hairless male floral bracts, and is easily confused in the eastern populations), *L. cordatum* (35%, which has nodding heads), *L. cryptocephalum* (12%, which has flat fruit), and also with *L. barkerae, daphnoides* and *loranthifolium*.
Records of identification queries = 59.
Records of corrected identification queries = 26.

Variation and Taxonomy: This is a variable species, but most of the extreme forms have been recognized as distinct species. Variation in the species as now delimited is limited, but no geographical variation has been documented.

Distribution: Add.
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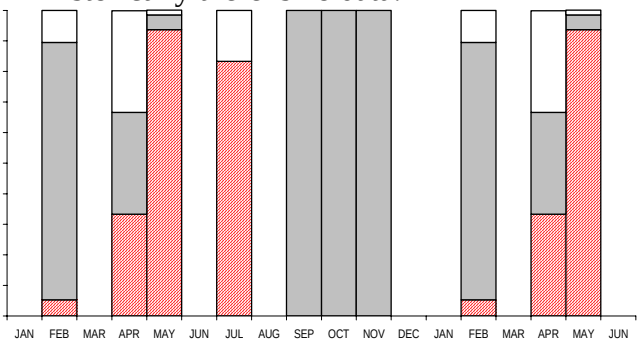
Leucadendron 'touwsriverensis' (undescribed)
Touwsriver Conebush
Toffeeappel Tolbos

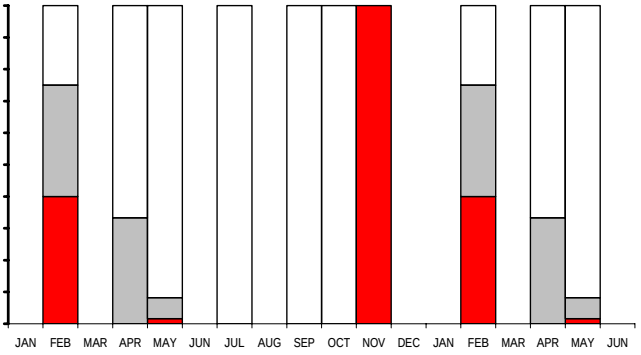
Other Common Names: None known.
Other Scientific Names: None.

95 Records

Population (94 records): 40% Common, 44% Frequent, 16% Rare.
Dispersion (87 records): 55% variable, 45% clumped.
Flowering (94 records with: Jan 0, Feb 19, Mar 0, Apr 3, May 63, Jun 0, Jul 6, Aug 0, Sep 1, Oct 1, Nov 1, Dec 0): Buds from Apr to Jul; Flowering, Peak Flowering and Over not recorded; Fruit from Sept to Apr; Nothing from Apr. Peak levels unreliable. Historically there is no data.



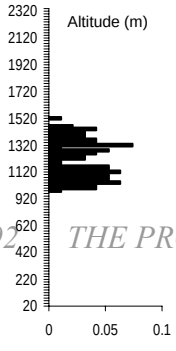
Growth (93 records with: Jan 0, Feb 20, Mar 0, Apr 3, May 61, Jun 0, Jul 6, Aug 0, Sep 1, Oct 1, Nov 1, Dec 0): Much from Nov to Feb; Rare from Feb and Apr; None from Oct 100. Peak levels unreliable at 100% in Nov.



Seedlings (39 records): Absent in 95%: more seedlings than prefire adults in 1 case. Seedlings found in May.
Fire Survival (4 records): 75% survived by seedlings only, 25% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 100% at 16 years, no data from younger veld.

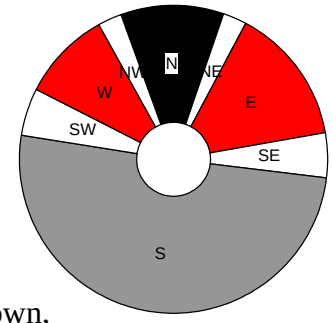
Height (92 records): 53% 0.2-1 m tall, 47% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:



Distance to Ocean (95 records): 100% inland - further than 2 km from coast.
Altitude (95 records): 860 - 1420 m; 960 $_{lq}$ - 1060 $_{med}$ - 1180 $_{uq}$m.

Landform (95 records): 57% deep soil, 43% shallow soil.
Slope (95 records): 43% gentle incline, 36% steep incline, 15% hill top, 4% valley bottom, 2% platform.
Aspect (83 records): 56% South, 17% East, 14% North, 13% West.



Soil Type (95 records): 31% sandy, 24% loamy, 22% rocky, 17% gravelly, 6% clayey.
Soil Colour (93 records): 55% brown, 26% grey, 10% orange, 5% yellow, 4% red.
Geology (93 records): 76% sandstone, 23% shale, 1% Tertiary sands.
Vegetation (95 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A4c.
Occurrence (Fynbos): 920 km^2 with 9% conserved and 6% lost; Occupancy: 109 km^2 with 3% conserved and 7% lost. Fragmentation index: 5%.
Nature Reserves (95 records): 6% in Nature Reserves - inadequately conserved.
Habitat destruction (95 records): 98% extensive natural habitat, 1% corridors, 1% naturally linear habitats.
Alien Invasive Species (93 records): 98% none, 1% Fabaceae (chiefly alien *Acacia*), 1% Myrtaceae.
Alien Density (93 records): 98% alien-free, 2% sparse.

Cultivation & Utilization:
Picking (70 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
First atlassed as *L. barkerae* but strange - recurved involucral bracts! New species? (AGR97051801); Realized not be *L. barkerae* - and all rest for day - recurved involucral bracts! (AGR97051802); Some *L. barkerae* plants had much bigger leaves than the others: see specimen (LYM97051705); More than 10 *L. barkerae* were very robust with bigger than normal leaves (LYM97051804); There is something funny going on with *L. barkerae* - there is a big leaf form which has the characteristic recurved bracts of *L. tinctum.* (NGF97051704);

Herbarium Specimen And DNA taken (NGF99042505);
At base of population some 2/3 of plants recently dead: drought! (since April!) 1/2 way through flowering when died - live ones aborted flowers – of 700 plants only 3 seen in bud (AGR99072501); 1/3 dead lately (AGRY1020605); Quite a few plants stressed (WMP99042504);
Attracting bees to cones with oily bracts (SHR97092402);

Confusing Species: Initially atlassed as *L. barkerae* with notes as to its differences. One instance each of misidentification with *L. glaberrimum* subsp. *glaberrimum* and *L. tinctum.*
Records of identification queries = 39.
Records of corrected identification queries = 35.

Variation and Taxonomy: No variation noted.
This is an undescribed species, differing from *L. tinctum* in that it has many more basal involucral bracts, with clasping involucral leaves, narrower leaves and an erect habit with ascending leaves. In giss it is most similar to *L.orientale*.
The following specimens are of this species: Esterhuysen 15577 Stettynsberg, Esterhuysen 18705 Matroosberg. Also Acocks (?? Prinspoort).

Distribution: Add.
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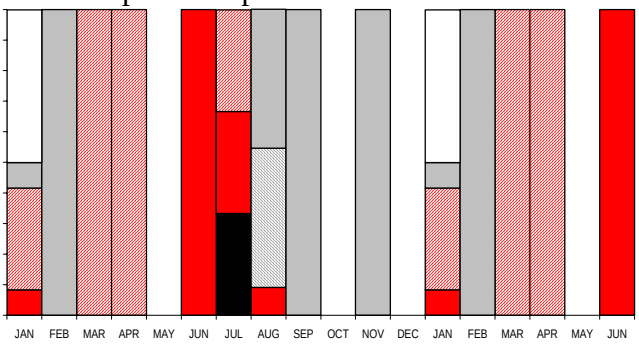
Leucadendron tradouwense Williams 1972
Tradouw Conebush

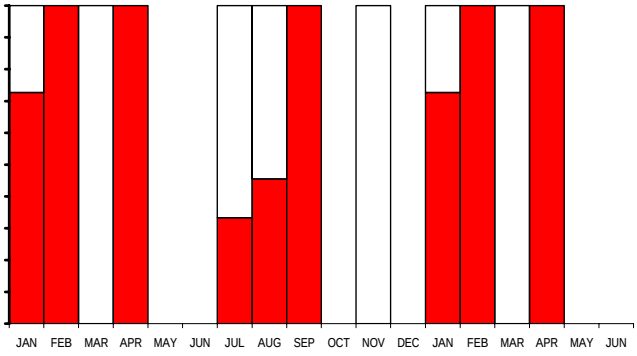
Other Common Names: Lemon-rosette Conebush.
Other Scientific Names: None.

35 Records

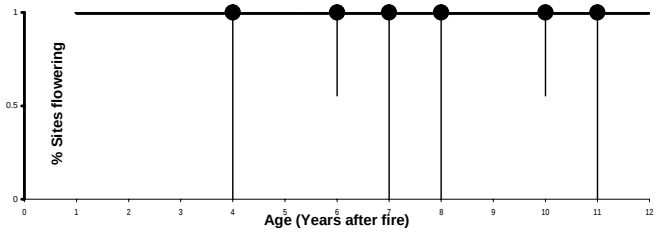
Population (34 records): 3% Abundant, 38% Common, 50% Frequent, 9% Rare.
Dispersion (33 records): 70% clumped, 24% variable, 6% evenly distributed.
Flowering (34 records with: Jan 12, Feb 1, Mar 3, Apr 1, May 0, Jun 1, Jul 3, Aug 11, Sep 1, Oct 0, Nov 1, Dec 0): Buds from Jan, Mar to Apr and Jul; Flowering from Jun to Jul; Peak Flowering from Jul; Over from Aug; Fruit from Feb and Aug to Nov; Nothing from Jan. Peak levels unreliable at 100% in Jul. Historically recorded as flowering in Jun, fruit ripen in Sep and are shed.



Growth (32 records with: Jan 11, Feb 1, Mar 3, Apr 1, May 0, Jun 0, Jul 3, Aug 11, Sep 1, Oct 0, Nov 1, Dec 0): Much from Jan to Feb and Apr to Sep; Rare not recorded; None from Nov to Jan, Mar and Jul to Aug. Peak levels unreliable.

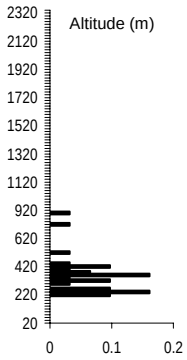


Seedlings (16 records): All without any seedlings present.
Fire Survival (1 record): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 2-3 years, and 100% recorded at 4 years.

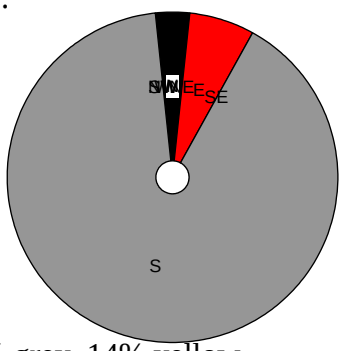


Height (35 records): 9% 0-0.2 m tall, 46% 0.2-1 m tall, 46% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (30 records): 100% inland - further than 2 km from coast.
Altitude (30 records): 200 - 800 m; 220 $_{lq}$ - 260 $_{med}$ - 320 $_{uq}$m.



Landform (30 records): 83% deep soil, 13% rocky outcrops, 3% shallow soil.
Slope (30 records): 53% steep incline, 30% gentle incline, 10% cliff, 7% hill top.
Aspect (30 records): 93% South, 7% East.



Soil Type (29 records): 45% sandy, 38% loamy, 10% rocky, 3% clayey, 3% gravelly.
Soil Colour (29 records): 66% brown, 17% grey, 14% yellow, 3% black.
Geology (30 records): 83% sandstone, 17% shale.
Vegetation (30 records): 97% shrubland, 3% grassland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered B1b(i,ii,iii,iv)c(iv).
Occurrence (Fynbos): 35 km^2 with 2% conserved and 10% lost; Occupancy: 23 km^2 with 1% conserved and 32% lost. Fragmentation index: 62%.
Nature Reserves (30 records): 0% in Nature Reserves - unconserved.
Habitat destruction (30 records): 87% extensive natural habitat, 10% islands, 3% naturally linear habitats.
Alien Invasive Species (29 records): 41% Fabaceae (chiefly alien *Acacia*), 34% none, 24% *Pinus*.

Alien Density (29 records): 34% alien-free, 52% sparse, 7% abundant, 3% dense, 3% impenetrable.

Cultivation & Utilization:
Picking (28 records): 96% no sign of picking, 4% lightly picked.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Previous sites on s side of Tradouws Pass seem to have become extinct - severely overburned and overgrazed and no sign of ld trad could be found (LSA92070101); At last! Our search for *L. tradouwense* is ended on a sad note. Told us where they were last seen 6 years ago with a population of 6. We found 1 male and 1 female approximately 2 m tall - female prostrate and male propped up by *L. eucalyptifolium* - but both well. It is doomed for extinction if a burn does not come soon as the surrounding plants and fynbos are 4-5m tall. Exact location: 110 from 1st parapet wall, left side at drain 50m: 2 plants about 30m apart (VJK93091201); Vic Keightley says there are 3 plants in this locality 2 females seen (WIJ96041209); We heard on the grapevine that the recorded sites are going to be burned after Easter. It is long overdue as the plants have nearly reached the end of their life cycle. (VJK99032601); Original site where Dr Ion Williams recorded and collected in 1963. We recorded 2 plants after a 1.5 year search for them in Dec 1999. Fire burnt 1st time in 35yrs – May 1999 returned to find no seedlings or young. So it was a great surprise to find so many young plants as recorded here: if Dr Williams is alive tell him to come here in 2005 for some fresh material for the Compton Herbarium (VJKY1011301); The return of *L. tradouwense* is one of natures miracles! In 1999 the plants were distinct they were overgrown by Conebushes, grass, restio and Acacia. The site had not been burned for 35 yrs. In Dec 1999 a fire raged through the Tradouw Pass. In Jan 2000 there were no seedlings of any proteas. In Jan 2001 there were young seedlings 150 mm tall. Today it is in bud a few in peak flower! I am amazed how quickly they have grown. There are between 100/200 plants growing on this site (VJKY2070701); (VJKY1011301);
2 populations found on this farm (LSA92070101); The rest of the plants grow in a narrow belt along latitude 34°S at an altitude of 200 m. It is pleasing to see that on the west side of this site the Black Wattle invaders have been cleared and *L. tradouwense* is returning: well done Lindsay and Keith Moodie (VJK97080107); This is a new sighting of about 20 plants at an altitude of 200 m (VJK97080803); Strange - growing at altitude of 300m in a belt 100m wide - usually alt about 200m - plants not healthy and several dying: need a burn soon! (VJK97080805); The plants are growing in a belt about 100 m wide usually at 250m altitude (VJK97080806); The population count cannot be much over 100 plants and the future looks bleak for them as a burn is urgent the total number of plants in this general area in my estimation is less than 1000 plants - will check again (VJK97080809);

Confusing Species: Confused with *L. tinctum* (which is more sprawling with hairy branches and spreading leaves, narrower and more oily bracts) and *burchellii* (with involucral leaves clasping the flowerheads)
Records of identification queries = 7.
Records of corrected identification queries = 4.

Variation and Taxonomy: No variation known.

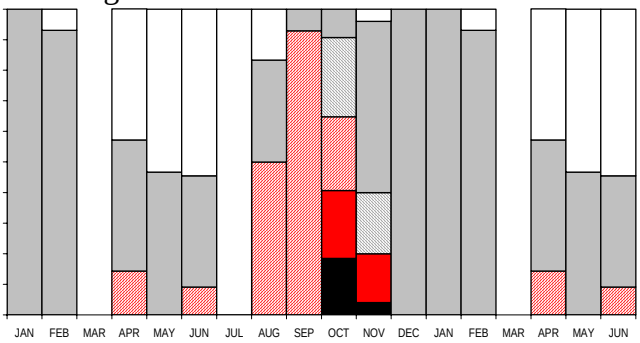
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDTRAD_m.jpg" * MERGEFORMAT \d

Leucadendron chamelaea (Lam.) Williams 1791, 1967
Witsenberg Conebush
Langbeentjiebos

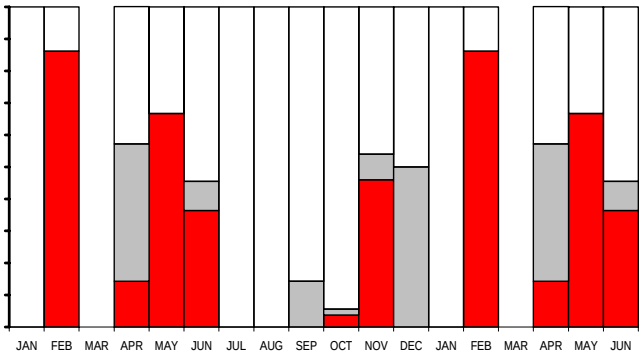
Other Common Names: Glutinous Protea.
Other Scientific Names: *decurrens* R.Br. 1810, *pyramidalis* (Thunb.) 1803.

193 Records

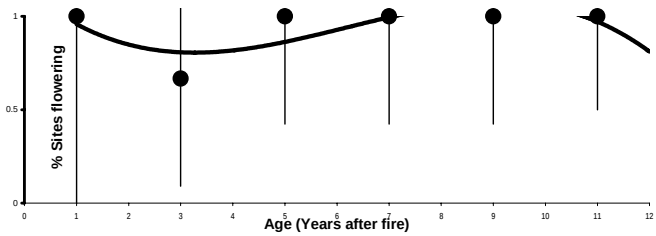
Population (189 records): 5% Abundant, 37% Common, 44% Frequent, 14% Rare.
Dispersion (172 records): 55% variable, 38% clumped, 6% widespread.
Flowering (193 records with: Jan 1, Feb 29, Mar 0, Apr 7, May 15, Jun 11, Jul 1, Aug 6, Sep 14, Oct 54, Nov 50, Dec 5): Buds from Aug to Oct; Flowering from Oct; Peak Flowering from Oct; Over from Oct to Nov; Fruit from Nov to Aug; Nothing from Apr to Jul. Peak levels at 91% in Oct. Historically recorded as flowering from Sep, fruits ripen in Jan, and are shed over a long period by strong wind.



Growth (192 records with: Jan 1, Feb 29, Mar 0, Apr 7, May 15, Jun 11, Jul 1, Aug 6, Sep 14, Oct 54, Nov 50, Dec 4): Much from Feb and May to Jun and Nov; Rare from Apr and Dec; None from Apr to Jan. Peak levels unreliable at 86% in Feb.

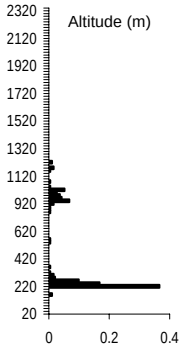


Seedlings (77 records): Absent in 82%: fewer seedlings than prefire adults in 6 cases, and more in 1 case. Seedlings found in Jun (3) and Nov (4).
Fire Survival (10 records): 70% survived by seedlings only, 20% eliminated from the area by fires, 10% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% estimated at 4-5 years.

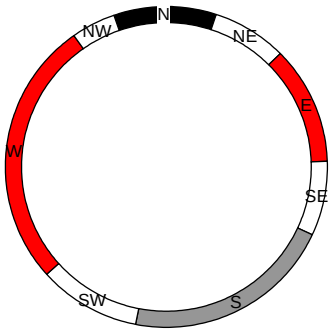


Height (191 records): 1% 0-0.2 m tall, 14% 0.2-1 m tall, 77% 1-2 m tall, 8% 2-5 m tall.
Pollinators (4 records): 75% beetles, 25% flies.
Detailed Pollinators (2 records): Monkey Beetle.

Habitat:
Distance to Ocean (188 records): 100% inland - further than 2 km from coast.
Altitude (188 records): 200 - 1120 m; 200 *lq* - 220 *med* - 220 *uq*m.



Landform (188 records): 99% deep soil,.
Slope (187 records): 51% platform, 32% valley bottom, 18% gentle incline.
Aspect (64 records): 36% West, 27% South, 20% East, 17% North.



Soil Type (188 records): 73% sandy, 16% loamy, 5% clayey, 3% gravelly, 2% rocky.
Soil Colour (184 records): 39% grey, 38% brown, 11% white, 7% yellow, 5% orange.
Geology (157 records): 55% sandstone, 20% Tertiary sands, 13% conglomerate, 10% shale, 3% silcrete or ferricrete.
Vegetation (186 records): 94% shrubland, 5% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A4c.
Occurrence (Fynbos): 1 425 km^2 with 16% conserved and 29% lost; Occupancy: 198 km^2 with 2% conserved and 56% lost. Fragmentation index: 12%.
Nature Reserves (188 records): 2% in Nature Reserves - unconserved.
Habitat destruction (186 records): 54% extensive natural habitat, 32% islands,

10% road verges, 2% corridors, 1% naturally linear habitats, 1% naturally fragmented habitats.
Alien Invasive Species (181 records): 31% Fabaceae (chiefly alien *Acacia*), 23% none, 22% *Pinus*, 17% *Hakea*, 5% Myrtaceae, 2% annual alien grasses.
Alien Density (180 records): 23% alien-free, 54% sparse, 18% abundant, 3% dense, 1% impenetrable.

Cultivation & Utilization:
Picking (141 records): 98% no sign of picking, 2% lightly picked.
Cultivation Status: Plantings - 3 records (2%).

Atlassers Notes:
Large specimen in cone and 9 small (WMP99092601);
Heavy grazing and trampling by cattle, burned area nearby (NAH92061706);
Chopped down in road verges for *'Vaalwurm'* (ASP94111516); Some plants had been chopped out (LYM96042505);
Lots of seedlings dead (about 2/3) (AGRY0112206); Not affected by heat? which killed other proteas (AGRY0112301); Many plants have died (GEH95051702); Numerous dead specimens - viruses? (NAH92061702);

Confusing Species: No confusing species noted.
Records of identification queries = 5.

Variation and Taxonomy: No significant variation known.

Distribution: Add.
Pillans & Garside at Groot Drakenstein.
INCLUDEPICTURE "C:\\temp\\atlas\\LDCHAM_m.jpg" * MERGEFORMAT \d

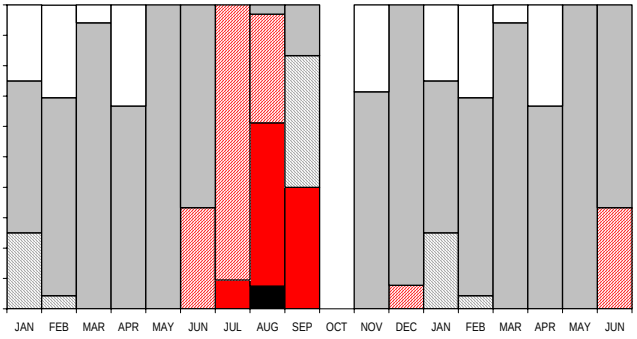
Leucadendron elimense subspecies *elimense* Phill. 1939

Elim Conebush

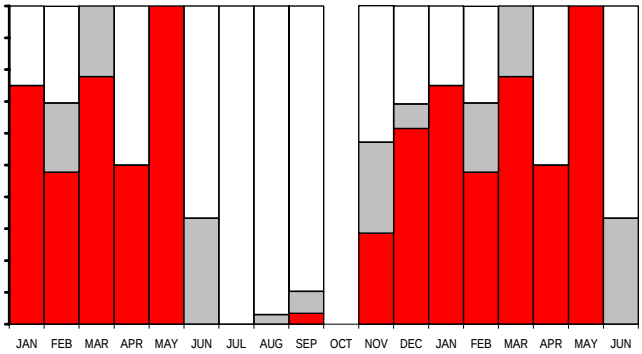
Elimtolbos

Other Common Names: *Bergkatjiepiering, Elim mense.*
Other Scientific Names: None.

247 Records
Population (243 records): 16% Common, 53% Frequent, 30% Rare.
Dispersion (168 records): 57% variable, 43% clumped.
Flowering (192 records with: Jan 4, Feb 23, Mar 17, Apr 6, May 1, Jun 3, Jul 21, Aug 67, Sep 30, Oct 0, Nov 7, Dec 13): Buds from Jun to Aug; Flowering from Aug to Sep; Peak Flowering not significant; Over from Jan and Sep; Fruit from Nov to Jun; Nothing from Jan to Feb, Apr and Nov. Peak levels at 97% in Aug. Historically recorded as flowering from Aug to Sep, fruits ripen in Feb and are shed.



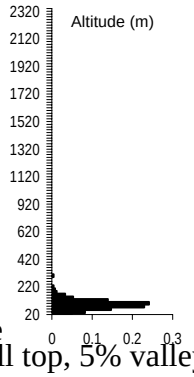
Growth (192 records with: Jan 4, Feb 23, Mar 18, Apr 6, May 1, Jun 3, Jul 21, Aug 67, Sep 29, Oct 0, Nov 7, Dec 13): Much from Nov to May; Rare from Feb to Mar, Jun and Nov; None from Jun to Feb and Apr. Peak levels at 100% in Mar.



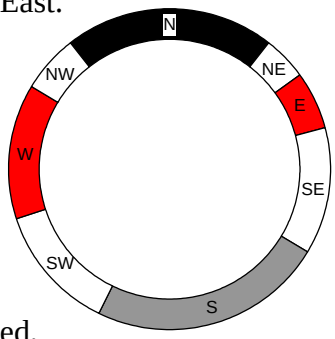
Seedlings (49 records): All without any seedlings present.
Fire Survival (4 records): 50% eliminated from the area by fires, 25% survived by seedlings only, 25% resprouted from underground boles.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 2-3 years, and 100% recorded at 7 years.

Height (192 records): 53% 0.2-1 m tall, 44% 1-2 m tall, 2% 2-5 m tall.
Pollinators (2 records): 50% flies, 50% beetles.
Detailed Pollinators (1 record): Monkey Beetle.

Habitat:
Distance to Ocean (244 records): 100% inland - further than 2 km from coast.
Altitude (244 records): 20 - 300 m; 40 $_{lq}$ - 80 $_{med}$ - 80 $_{uq}$m.



Landform (192 records): 94% deep soil, 4% shallow soil, 1% riverine.
Slope (191 records): 50% gentle incline, 36% platform, 9% hill top, 5% valley bottom.
Aspect (118 records): 36% South, 26% North, 24% West, 14% East.



Soil Type (189 records): 34% loamy, 32% clayey, 24% sandy, 10% gravelly.
Soil Colour (189 records): 58% brown, 29% grey, 8% orange, 2% red, 2% white, 1% yellow.
Geology (214 records): 45% shale, 36% silcrete or ferricrete, 16% sandstone, 1% Tertiary sands.
Vegetation (242 records): 97% shrubland, 2% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Endangered A2c.
Occurrence (Fynbos): 787 km² with 5% conserved and 39% lost; Occupancy: 291 km² with 10% conserved and 51% lost. Fragmentation index: 33%.
Nature Reserves (244 records): 9% in Nature Reserves - inadequately conserved.
Habitat destruction (193 records): 53% extensive natural habitat, 25% road verges, 20% islands, 1% naturally fragmented habitats.

Alien Invasive Species (190 records):
69% Fabaceae (chiefly alien *Acacia*), 15% none, 8% *Pinus*, 7% Myrtaceae, 1% other aliens.
Alien Density (190 records): 15% alien-free, 63% sparse, 20% abundant, 2% dense.

Cultivation & Utilization:
Picking (145 records): 95% no sign of picking, 3% lightly picked, 1% severely picked.
Cultivation Status: Plantings - 1 record.

Atlassers Notes:
This is the strange form: very tall 3-4 m (DEB99031802); Identity suspect: unusually tall (2m) with overlapping leaves (SHR95092301); Small yellow plants (SSA92082702);
About 1/5 seeds still in cones: all cones on plant (AGR96040801);
Both males (AGRY0081606); 3 males (AMMY0032908);
Plus 2 dead (AGRY1022810); 9 dead to every one alive (AGRY1030124); A lot of plants were dead (LYMY0081611); Plants unhealthy yellow: 2 dead, remainder have new healthy growth (MJDY1011902); As many skeletons standing around as live ones (SMRY0081608); More skeletons than living plants (SMRY0081611);
Chopped out of road reserve (DJLY0081612);
2 Arum Lily Frogs Found on one plant - well camouflaged on leaves (LYM97081603);

Confusing Species: Confused once with *L. nervosum* (how?) and *L. tinctum* (seeds not nuts, involucral bracts not recurved).
Records of identification queries = 6.
Records of corrected identification queries = 2.

Variation and Taxonomy: This is a variable species.
- More normal populations are mostly between Strandkloof and Elim, but even these have odd plants of unusual size.
- Small forms, both in stature (often not exceeding 1m tall) and leaf and cone sizes, occur to the north and east of this, and (from atlas data) to the west.
- Large forms , both in stature – over 2 m tall - and leaf and cone sizes, occur to the south and east.

The type specimen (Stokoe sn 8/1936, PRE 21906) locality at Kogelberg is clearly incorrect, and the locality of Bredasdorp (Stokoe sn 8/1936, SAM 52191) is more likely.

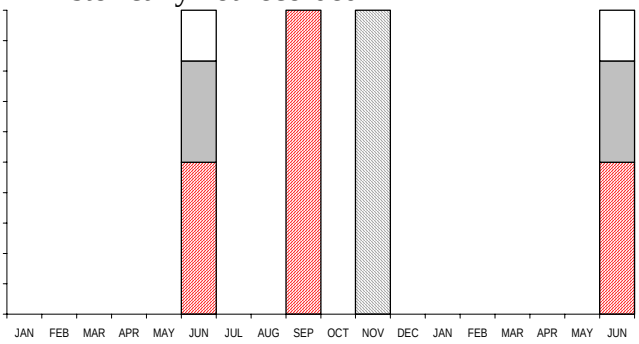
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDELIME_m.jpg" * MERGEFORMAT \d

Leucadendron elimense subspecies '*nova*' (unpublished)
Greyton Conebush

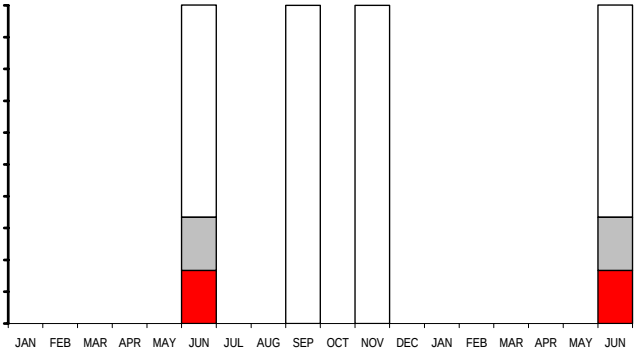
Other Common Names: None known.
Other Scientific Names: *None.*

10 Records

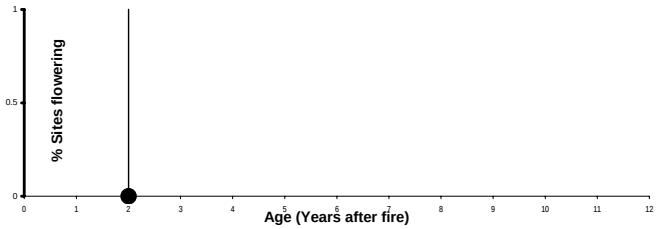
Population (9 records): 56% Common, 33% Frequent, 11% Rare.
Dispersion (9 records): 56% variable, 44% clumped.
Flowering (9 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 6, Jul 0, Aug 0, Sep 2, Oct 0, Nov 1, Dec 0): Buds from Jun to Sep; Flowering and Peak Flowering not recorded; Over from Nov; Fruit from Jun; Nothing not significant. Peak levels unreliable. Historically not recorded



Growth (9 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 6, Jul 0, Aug 0, Sep 2, Oct 0, Nov 1, Dec 0): Much and Rare not significant in Jun, but summer data lacking; None from Jun to Nov. Peak levels unreliable.



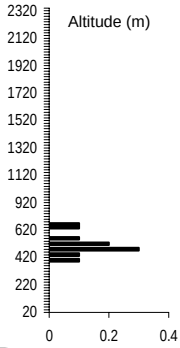
Seedlings (3 records): All without any seedlings present.
Fire Survival : No data.
Age to first flowering: No flowers recorded from 2-year old veld: no other data.



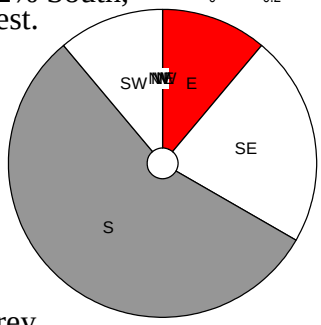
Height (9 records): 67% 0.2-1 m tall, 33% 1-2 m tall.

Pollinators (2 records): 100% beetles.
Detailed Pollinators (1 record): Great Protea Beetle.

Habitat:
Distance to Ocean (10 records): 100% inland - further than 2 km from coast.
Altitude (10 records): 380 - 660 m; 460 $_{lq}$ - 480 $_{med}$ - 480 $_{uq}$m.



Landform (10 records): 80% deep soil, 20% shallow soil.
Slope (10 records): 60% steep incline, 40% gentle incline.
Aspect (9 records): 72% South, 17% East, 11% West.



Soil Type (10 records): 40% clayey, 30% gravelly, 20% loamy, 10% rocky.
Soil Colour (10 records): 80% brown, 10% black, 10% grey.
Geology (10 records): 90% shale, 10% sandstone.
Vegetation (10 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered B1a(ii)b(i,ii,iii,v)c(iv) + 2a(ii)b(i,ii,iii,v)c(iv).
Occurrence (Fynbos): 4 km^2 with 0% conserved and 16% lost; Occupancy: 11 km^2 with 0% conserved and 27% lost. Fragmentation index: meaningless.
Nature Reserves (10 records): 0% in Nature Reserves - unconserved.
Habitat destruction (10 records): 90% extensive natural habitat, 10% naturally linear habitats.
Alien Invasive Species (10 records): 70% *Hakea*, 30% none.
Alien Density (10 records): 30% alien-free, 70% sparse.

Cultivation & Utilization:
Picking (9 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes: None.

Confusing Species: None recorded: recognized as *L. elimense* but unlike existing forms upon discovery.
Records of identification queries = 8.
Records of corrected identification queries = 3.

Variation and Taxonomy: This species is clearly *L. elimense,* but has features of *L. globosum* and thus resembles *L. tinctum*

more than any other subspecies of *L. elimense*.

Distribution: Add.

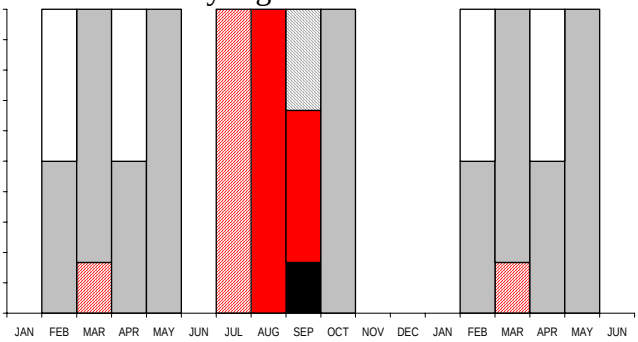
INCLUDEPICTURE "C:\\temp\\atlas\\LDELIMN_m.jpg" * MERGEFORMAT \d

Leucadendron elimense subspecies *salteri* Williams 1972
Caledon Conebush

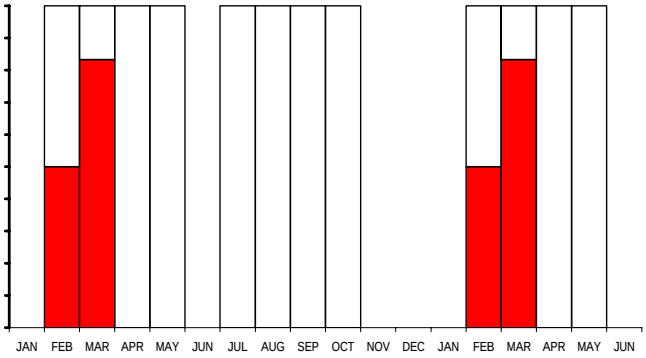
Other Common Names: None known.
Other Scientific Names: *None.*

21 Records

Population (21 records): 29% Common, 57% Frequent, 14% Rare.
Dispersion (19 records): 53% variable, 47% clumped.
Flowering (21 records with: Jan 0, Feb 2, Mar 6, Apr 2, May 1, Jun 0, Jul 1, Aug 2, Sep 6, Oct 1, Nov 0, Dec 0): Buds from Jul; Flowering from Aug to Sep; Peak Flowering from Sep; Over from Sep; Fruit from Oct to May; Nothing from Feb and Apr. Peak levels unreliable at 100% from Aug to Sep. Historically recorded as flowering from late Aug to Sep, fruit Feb and released slowly from cones by high wind.



Growth (21 records with: Jan 0, Feb 2, Mar 6, Apr 2, May 1, Jun 0, Jul 1, Aug 2, Sep 6, Oct 1, Nov 0, Dec 0): Much from Feb to Mar; Rare not recorded; None from Apr to Feb. Peak levels unreliable at 83% in Mar.

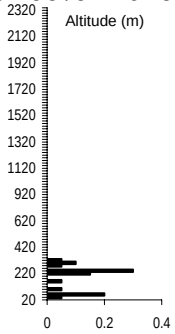


Seedlings (10 records): All without any seedlings present.
Fire Survival (1 record): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 100% at 16 years, no data from younger veld.

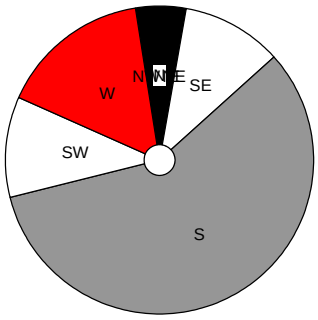
Height (21 records): 38% 0.2-1 m tall, 62% 1-2 m tall.
Pollinators (1 record): 100% beetles.
Detailed Pollinators (1 record): Monkey Beetle.

Habitat:

Distance to Ocean (20 records): 100% inland - further than 2 km from coast.
Altitude (20 records): 20 - 320 m; 80 $_{lq}$ - 220 $_{med}$ - 240 $_{uq}$m.



Landform (20 records): 95% deep soil, 5% shallow soil.
Slope (20 records): 85% gentle incline, 10% steep incline, 5% hill top.
Aspect (19 records): 68% South, 21% West, 5% North, 5% East.



Soil Type (20 records): 35% sandy, 30% loamy, 30% clayey, 5% gravelly.
Soil Colour (20 records): 75% brown, 15% grey, 5% black, 5% yellow.
Geology (18 records): 61% shale, 22% silcrete or ferricrete, 17% sandstone.
Vegetation (19 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered B2a(i)b(i,ii,iii,iv,v)c(iv).
Occurrence (Fynbos): 195 km^2 with 7% conserved and 32% lost; Occupancy: 17 km^2 with 0% conserved and 67% lost. Fragmentation index: 8%.
Nature Reserves (20 records): 0% in Nature Reserves - unconserved.
Habitat destruction (20 records): 60% extensive natural habitat, 35% islands, 5% road verges.
Alien Invasive Species (19 records): 37% Fabaceae (chiefly alien *Acacia*), 26% none, 21% *Pinus*, 16% *Hakea*.
Alien Density (19 records): 26% alien-free, 37% sparse, 16% abundant, 16% dense, 5% impenetrable.

Cultivation & Utilization:
Picking (17 records): 82% no sign of picking, 12% severely picked, 6% lightly picked.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Only about 140 plants seen about 15 dead (AGR98030511); Also 1 dead (CHE98030502); Few older large plants with most of pop made up of young plants not yet flowering. Occurs on edge of Botrivierplaas and into the road reserve (MAJ93021701); 13 Plants surviving in road reserve under pines - severely picked remainder of population ploughed up by the owner despite being informed on several occasions about the plants on his property! (MAJY1031401); 2 Living plants and 1 dead in this plot. was

scraped of all vegetation along canal about 3 years ago and these three plants probably germinated then but no sign of more plants. Mountain Fynbos less than 10 m away (NAHY4021801); A very recent patchy fire has wiped out many plants but many plants still remain (NGF96070607); Between 10 and 20 plants (all on the roadside) (SMRY2082901);

Cones on older plants open but with seed still retained in cone (MAJ93021701);

Confusing Species: None noted.

Variation and Taxonomy: No variation recorded.

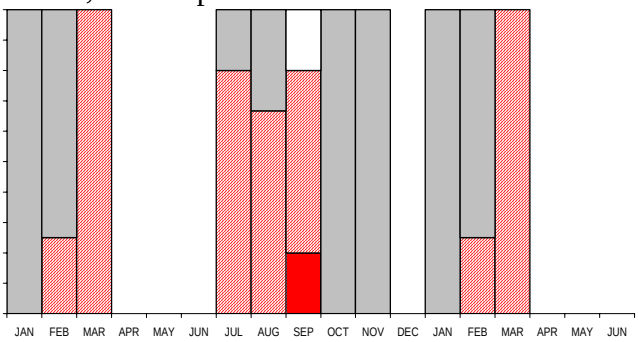
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDELIMS_m.jpg" * MERGEFORMAT \d

Leucadendron elimense subspecies *vyeboomensis* Williams 1972
Vyeboom Conebush

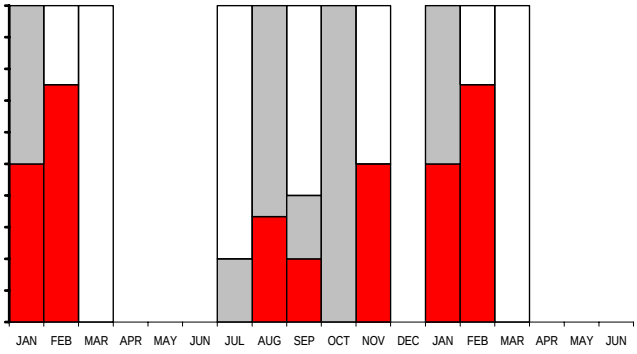
Other Common Names: None known.
Other Scientific Names: None.

23 Records

Population (23 records): 17% Common, 70% Frequent, 13% Rare.
Dispersion (23 records): 74% variable, 22% clumped, 4% widespread.
Flowering (23 records with: Jan 2, Feb 4, Mar 1, Apr 0, May 0, Jun 0, Jul 5, Aug 3, Sep 5, Oct 1, Nov 2, Dec 0): Buds from Feb to Sep; Flowering from Sep; Peak Flowering and Over not recorded; Fruit from Oct to Feb and Aug; Nothing from Sep. Peak levels unreliable at 80% in Sep. Historically recorded as flowering from late Sep to early Oct, fruits ripen in Feb and are shed.



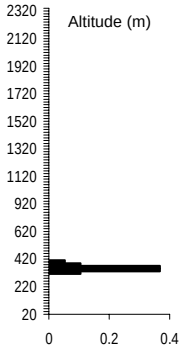
Growth (23 records with: Jan 2, Feb 4, Mar 1, Apr 0, May 0, Jun 0, Jul 5, Aug 3, Sep 5, Oct 1, Nov 2, Dec 0): Much from Aug to Feb; Rare from Jan, and Jul to Oct; None from Feb to Jul, Sep and Nov. Peak levels unreliable at 100% in Jan.



Seedlings (9 records): All without any seedlings present.
Fire Survival : No data.
Age to first flowering: First flowers recorded at 4 years, 50% estimated at 3 years, and 100% recorded at 4 years.

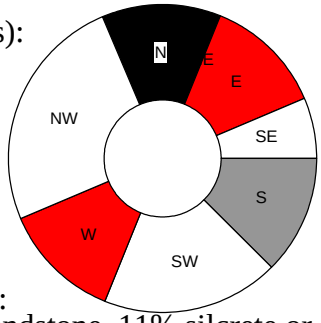
Height (22 records): 5% 0-0.2 m tall, 77% 0.2-1 m tall, 18% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (19 records): 100% inland - further than 2 km from coast.
Altitude (19 records): 300 - 400 m; 320 *lq* - 340 *med* - 340 *uq*m.



Landform (19 records): 100% deep soil.
Slope (19 records): 63% gentle incline, 32% platform, 5% steep incline.
Aspect (16 records): 38% West, 25% North, 22% South, 16% East.

Soil Type (19 records): 53% loamy, 32% sandy, 16% clayey.
Soil Colour (19 records): 47% brown, 26% grey, 21% orange, 5% yellow.



Geology (19 records): 47% shale, 42% sandstone, 11% silcrete or ferricrete.
Vegetation (19 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered B2a(i)b(i,ii,iii,iv,v)c(iv).
Occurrence (Fynbos): 12 km^2 with 18% conserved and 51% lost; Occupancy: 17 km^2 with 19% conserved and 55% lost. Fragmentation index: meaningless.
Nature Reserves (19 records): 26% in Nature Reserves.
Habitat destruction (19 records): 84% extensive natural habitat, 5% patches, 5% islands, 5% corridors.
Alien Invasive Species (19 records): 68% *Pinus*, 11% Fabaceae (chiefly alien *Acacia*), 11% none, 5% *Hakea*, 5% annual alien grasses.
Alien Density (19 records): 11% alien-free, 84% sparse, 5% abundant.

Cultivation & Utilization:
Picking (20 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Pruning by the Vlei Rat *Otomus* on 1 plant (BAW96072403); One plant broken and leaves grazed - herbivore? (MAJ92020101); Population very much in decline: action urgently needed. Population very small! (AGR92020407); Lots of plants dead

especially females (AGR99092001); Most plants dead (AGRY0012202); Population = 3 (BAW96072403); These plants look exceptionally healthy: 11 adults dead - it seems as though it could be caused by heat stress or some other environmental factor - the other possibility would be *Phytophthora.* The ones in the fence area are in pretty bad shape (IEBY1090301); 2 dead plants found on this plot (LYM96072405); 9 females, 4 males and 7 dead plants. Pines more dense around the plants (MAJ92020101); 60-70% of the plants have died in the last year (NGF97111502); Major mortality (SHR97091401); Dead Plants also frequent (estimate of live plants 60 to 100) (SMR96072406); All numbered: at least 127 tags! Estimate about 30 dead and 80 flourishing seen on the Theewaterskloof side of road (SMRY2022801); 5 plants outside fenced area (IEBY1090301);

Confusing Species: None noted.

Variation and Taxonomy: No variation noted.

Distribution: Add.
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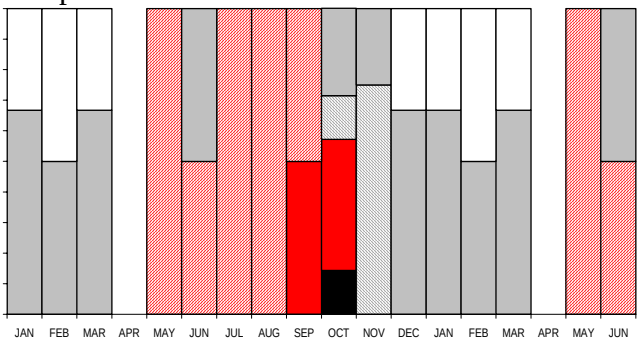
MERGEFORMAT \d

Leucadendron globosum (Ken. ex Andr.) Williams 1803, 1967
Grabouw Conebush

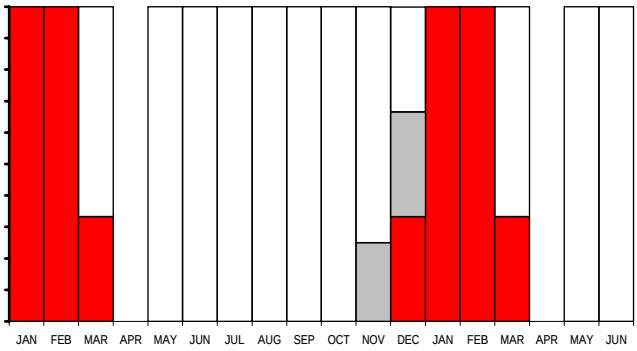
Other Common Names: Elgin Conebush, Mountain Rose, One-colour Euryspermum, *Bergroos.*
Other Scientific Names: *concolor* Salisb. ex Knight 1809, *ovale* R.Br. 1810.

42 Records

Population (41 records): 15% Frequent, 85% Rare.
Dispersion (36 records): 56% clumped, 42% variable, 3% evenly distributed.
Flowering (40 records with: Jan 3, Feb 2, Mar 3, Apr 0, May 2, Jun 2, Jul 3, Aug 5, Sep 6, Oct 7, Nov 4, Dec 3): Buds from May to Sep; Flowering from Sep to Oct; Peak Flowering not significant - in Oct; Over from Nov; Fruit from Oct to Mar and Jun; Nothing from Dec to Mar. Peak levels unreliable at 100% in Sep. Historically recorded as flowering from late Sep to early Oct, fruit ripen in Feb and are shed.



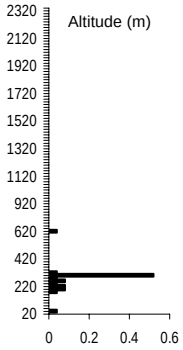
Growth (42 records with: Jan 5, Feb 2, Mar 3, Apr 0, May 2, Jun 2, Jul 3, Aug 5, Sep 6, Oct 7, Nov 4, Dec 3): Much from Dec to Mar; Rare from Nov to Dec; None from Mar. Peak levels unreliable at 100% in Jan to Feb.



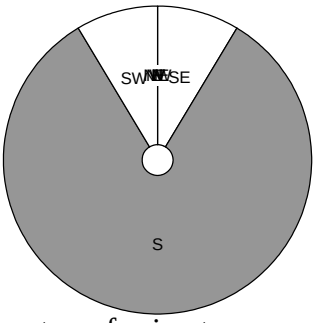
Seedlings (17 records): All without any seedlings present.
Fire Survival : No data.
Age to first flowering: First flowers recorded at 100% at 16 years, no data from younger veld.

Height (42 records): 19% 0.2-1 m tall, 79% 1-2 m tall, 2% 2-5 m tall.
Pollinators (1 record): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (24 records): 100% inland - further than 2 km from coast.
Altitude (24 records): 160 - 620 m; 240 $_{lq}$ - 300 $_{med}$ - 300 $_{uq}$m.



Landform (23 records): 96% deep soil, 4% shallow soil.
Slope (23 records): 52% steep incline, 48% gentle incline.
Aspect (23 records): 91% South, 4% East, 4% West.



Soil Type (23 records): 52% clayey, 26% loamy, 22% gravelly.
Soil Colour (23 records): 61% brown, 39% orange.
Geology (18 records): 78% shale, 17% silcrete or ferricrete, 6% sandstone.
Vegetation (23 records): 78% shrubland, 22% plantations.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A2c, B1b(i,ii,iii,iv,v)c(iv),
Occurrence (Fynbos): 55 km^2 with 2% conserved and 95% lost; Occupancy: 20 km^2 with 1% conserved and 89% lost. Fragmentation index: 36%.
Nature Reserves (24 records): 4% in Nature Reserves - unconserved.
Habitat destruction (23 records): 48% road verges, 48% islands, 4% extensive natural habitat.
Alien Invasive Species (23 records): 74% *Pinus*, 22% Fabaceae (chiefly alien *Acacia*), 4% Myrtaceae.
Alien Density (23 records): 30% sparse, 48% abundant, 22% dense.

Cultivation & Utilization:
Picking (31 records): 97% no sign of picking, 3% severely picked.
Cultivation Status: Plantings - 1 record (2%).

Atlassers Notes:
N2 - Palmiet River (type) population:
Down to 3 males and 1 female (AGR95111001); 3 males & 1 female - female in poor condition (SMR96052205); 3 male 1 female plant found (LYM96062201); Only 3 plants - all male (JID97101701); 3 males only! in road reserve (MAJY0012902); 2 males: bush on the east side damaged with broken branches about 1 month old - both bushes have fallen over in poor condition (GNIY0110301); All 3 male

plants; two with no new growth at all and one with very young buds (leaf?) (SGAY1030906); These plants are not being cared for and have been damaged by the plantation wire fence and at least 2 branches of each is already dead; severely threatened by aliens as well (NAHY1062002); Two plants have been killed in the last 3 weeks after I believe the plants were sprayed with herbicide by roads department. I found 3 skeletons: the old female plant which died a few years ago and 2 males. The plant lowest down growing in amongst the ferns survived the desecration (NGFY1122601);
Only males left (AGRY1012602); All save 1 female [out of 13 male plants] killed by chopping area due for terraforming soon to apple orchard (ASP92092301); Lots of young plants (ASP92092303); Only 1 male seen on edge of dam plus 1 dead male in forest (ASP92092410); Female plant becoming moribund (DJL98072301); No females 1 plant dead (female) (GED99102901); 12 plants seen (KEH98102106); A total of 13 plants seen of which only 8 look healthy - the others senescing - urgently in need of fire and alien clearing (NAHY5031202); Counted 24 plants which all looked very happy (NGF98103101); PN Plants are male (SHR97091302); Farmer says 5 on farm all male and Elsenberg took cuttings. But David found a young plant that had not flowered - over that was my 3rd and I think the farm's 6th plant. It was height 2, the other 2 that we saw were old and leggy (SMR99102901);
Only in fire tracer! Farmer said area had been prepared for burning two years ago but nature conservation did not turn up to burn veld: now is moribund - needs to burn (APE95081706);

Confusing Species: Superficially most similar to *L. tinctum* (especially with the recurved basal bracts and colouring of the involucral leaves), but atlassers had no problems identifying this species, presumably because of its erect growth and distinct cones.
Records of identification queries = 1.

Variation and Taxonomy: No variation known.

Distribution: Add.
Threatened by lack of fire and regeneration.
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Leucadendron grandiflorum (Salisb.) R.Br. 1806, 1810
Wynberg Conebush

Other Common Names: Large-flower Euryspermum, Extinct Conebush.
Other Scientific Names: None.

0 Records: Extinct

Conservation Status and Threat:
Red Data List Status: Extinct, both in the wild and *ex situ*, probably since 1806.
Occurrence (Fynbos): 0 km^2 with 0% conserved and 100% lost; Occupancy: 0 km^2 with 0% conserved and 100% lost. Fragmentation index: meaningless. Original occupancy probably never exceeding 10 km^2.

Population: Probably Frequent and Common, but now sadly Extinct.
Dispersion: Probably Variable and Clumped.
Flowering: Probably: Buds from May to Aug; Flowering from Aug to Sep; Peak Flowering not significant; Over from Sep; Fruit from Oct to Mar; Nothing from Jan to May.
Growth: Probably Much from Nov to Feb; None from Apr to Nov.
Seedlings: Probably All without any seedlings present, due to lack of fires.
Fire Survival: Probably surviving as seeds only.
Age to first flowering: Probably flowering after 1 year, 100% flowering by 5 years.
Height: Probably 20% 0.2-1 m tall, 70% 1-2 m tall, 10% 2-5 m tall.
Pollinators: Probably Beetles.

Habitat:
Distance to Ocean: All 100% inland - more than 2 km from coast.
Altitude: Probably 100 - 300 m; 150 $_{lq}$ - 180 $_{med}$ - 200 $_{uq}$m.
Landform: Probably deep soils.
Slope: Probably gentle incline and steep incline.
Aspect: Probably South.
Soil Type: Probably clayey and loamy.
Soil Colour: Probably brown and orange.
Geology: Probably granite.
Vegetation: Probably shrubland.

Conservation Status and Threat:
Nature Reserves: Probably 0% in Nature Reserves. There is a small chance that it might have occurred near Cecilia, which is currently under pines, but within the National Park.
Habitat destruction: Probably 100% islands.
Alien Invasive Species: Probably *Pinus*, Fabaceae (chiefly alien *Acacia*) and *Hakea*.
Alien Density: Probably 50% abundant, 50% dense.

Cultivation & Utilization:
Picking: Probably no sign of picking.
Cultivation Status: Probably no noted cultivation, but given its status would most certainly be in Kirstenbosch.
Witch's Broom Infestation: Probably 0 records.

Confusing Species: None, due to its distribution, and malodorous male flowerheads. Although there is a chance that it might be mistaken for *L. laureolum* when not in flower. Occasionally some atlassers got very excited when *L. sessile* apparently planted on Southern Cross drive flowered. Herbarium specimens would probably easily be confused for *L. globosum*.

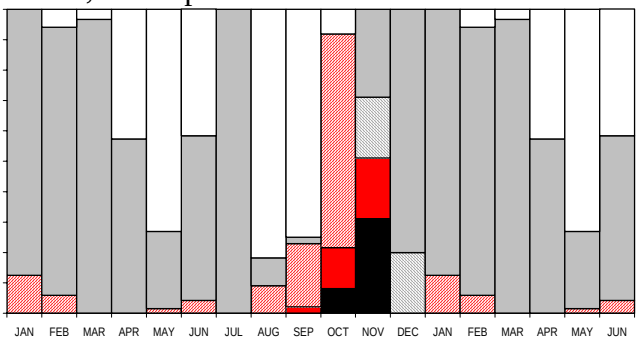
Variation and Taxonomy: No variation known.
A few persons have claimed that it might not be a good species based on a single plant, but Salisbury's description leaves no doubt that at least the male was quite distinct from the other Crown Conebushes. That coupled with the distribution make it highly likely that this was quite a distinct species. There are similarly scarce records of *L. macowanii* and *Protea scorzoneriifolia* from Constantia Valley, so the area had other either very localized or poorly-collected proteas.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDGRAN_m.jpg" * MERGEFORMAT \d

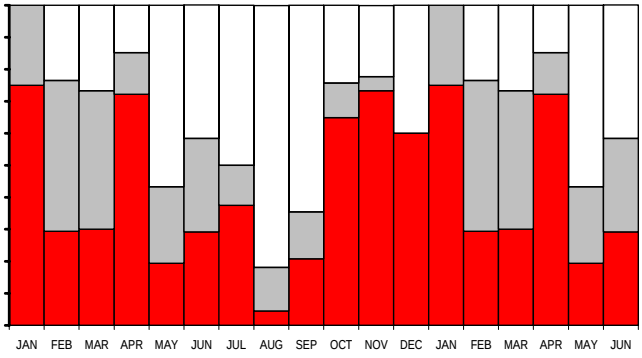
Leucadendron corymbosum Bergius 1766
Swartveld Conebush
Skraaltolbos

Other Common Names: Brunia-leaf Protea.
Other Scientific Names: *bruniades* L.f. 1781, *bruniaefolia* Salisb. ex Knight 1809.

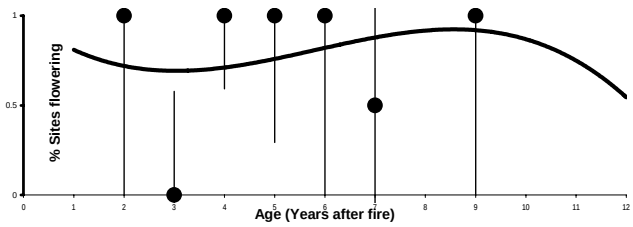
377 Records
Population (376 records): 3% Abundant, 49% Common, 40% Frequent, 7% Rare.
Dispersion (361 records): 67% variable, 31% clumped, 1% widespread
Flowering (373 records with: Jan 16, Feb 17, Mar 30, Apr 54, May 67, Jun 24, Jul 8, Aug 22, Sep 48, Oct 37, Nov 45, Dec 5): Buds from Sep to Oct; Flowering from Nov; Peak Flowering from Nov; Over from Nov to Dec; Fruit from Nov to Jul; Nothing from Apr to Sep. Peak levels at 91% in Oct. Historically recorded as flowering from late Sep to early Oct, fruit ripen after 4 months and are shed.



Growth (373 records with: Jan 16, Feb 17, Mar 30, Apr 54, May 67, Jun 24, Jul 8, Aug 22, Sep 48, Oct 37, Nov 45, Dec 5): Much from Sep to Jul; Rare from Jan to Mar and May to Jun; None from Feb to Mar and May to Dec. Peak levels at 100% in Jan.

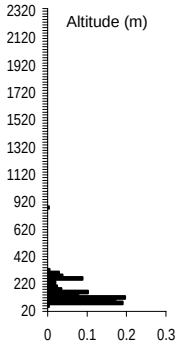


Seedlings (147 records): Absent in 88%: fewer seedlings than prefire adults in 4 cases, and more in 5 cases. Seedlings found in Jul, Sep, Oct, Nov (5) and Dec.
Fire Survival (10 records): 80% survived by seedlings only, 20% resprouted from underground boles.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 3-4 years, and 100% recorded at 4 years.

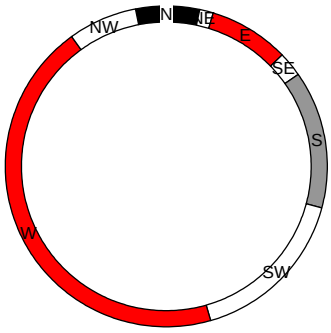


Height (375 records): 1% 0-0.2 m tall, 12% 0.2-1 m tall, 56% 1-2 m tall, 31% 2-5 m tall.
Pollinators (2 records): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (373 records): 100% inland - further than 2 km from coast.
Altitude (373 records): 40 - 780 m; 80 *lq* - 100 *med* - 120 *uq*m.



Landform (373 records): 97% deep soil, 3% swamp.
Slope (370 records): 58% platform, 25% gentle incline, 16% valley bottom, 1% dunes.
Aspect (207 records): 57% West, 22% South, 11% North, 10% East.



Soil Type (366 records): 44% sandy, 34% loamy, 13% clayey, 9% gravelly.
Soil Colour (365 records): 58% brown, 19% grey, 13% orange, 7% white, 2% red, 1% yellow.
Geology (309 records): 61% shale, 16% Tertiary sands, 12% sandstone, 6% conglomerate, 3% silcrete or ferricrete, 2% granite.
Vegetation (371 records): 93% shrubland, 4% agricultural lands, 1% grassland.

Conservation Status and Threat:
Red Data List Status: Vulnerable A2c.
Occurrence (Fynbos): 1 200 km^2 with 22% conserved and 43% lost; Occupancy: 280 km^2 with 21% conserved and 48% lost. Fragmentation index: 10%.
Nature Reserves (373 records): 54% in Nature Reserves - well conserved.
Habitat destruction (371 records): 75% extensive natural habitat, 14% islands, 7% road verges, 3% naturally linear habitats, 1% corridors.

Alien Invasive Species (363 records): 42% Fabaceae (chiefly alien *Acacia*), 41% none, 8% *Pinus*, 5% *Hakea*, 2% Myrtaceae, 2% annual alien grasses.
Alien Density (362 records): 41% alien-free, 37% sparse, 16% abundant, 5% dense, 1% impenetrable.

Cultivation & Utilization:
Picking (286 records): 100% no sign of picking, 0.3% lightly picked.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Habit:
A Few Plants greater than 2 m tall (SGAY1022012);
Appears to be both resprouting and reseeding; the resprouting plants are fewer but are already in bud (NAH92090706);
Grazing:
Heavily grazed - especially the lower most part of branches: presumably by ostriches (AGR95011119); Very overgrazed and one dead area badly overgrazed (AGRY2061301); Heavily grazed (SMR96090502);
Survival:
A weedy species - healthy colony with lots of cones and new growth (AGR91120106); A weed spreading in old lands! (ASP95060818);
Lots of young - good interfire recruitment! (AGR96042703 + 13); Lots of young (AGR96042704 + 19); Lots of young plants : expanding! (ASP94110302); Thousands of small plants standing in water amongst the less dense Acacias (CHE97061204);
Only two plants seen. Male and female - good seed crop including a few of last years crop (AGR91111620); 4 Males 1 female plant and 1 dead plant (AJT94111901); 1 live and 1 dead (ASP94071402); Many dead (CHE98051403); Many male plants! girls have got it good ! (VCH98100907);
Road Verges:
Some young plants in road verge only, rest mowed (AGR93011801); Mowed to 100 mm in road verge and thriving (AGR96041107); Happy with 100 mm high mowing (AGR96051001);
Half plants killed in *Acacia* removal! (AGR94071016); Chopped out as part of clearing operation (ASP94072701); No more plants To 3.2 km N - all now grass verges (AGR92071208);

Confusing Species: This is quite a distinct species, confused initially by one or two atlassers as *L. stellare* or *thymifolium*, but is not a resprouter and has a distinct growth corymbose growth habit, female cones and seeds.
Records of identification queries = 12.
Records of corrected identification queries = 4.

Variation and Taxonomy: Two manuscript names *ericifolia* and *purpurea* have never been published. The latter was quite widely used in the early 1800s. Salisbury regarded the name *corymbosum* as an error, but the flowerheads are somewhat corymb-like in appearance.
No variation is apparent or has been recorded. William's statement that the hybrid with *L. levisanus* recorded by Garside in 1938 at Mamre, was from an isolated population is probably the result of loss of intervening populations.

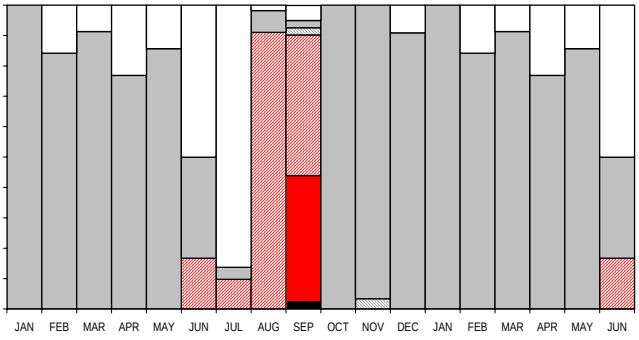
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDCORY_m.jpg" * MERGEFORMAT \d

Leucadendron laxum Williams 1967
Bredasdorp Conebush

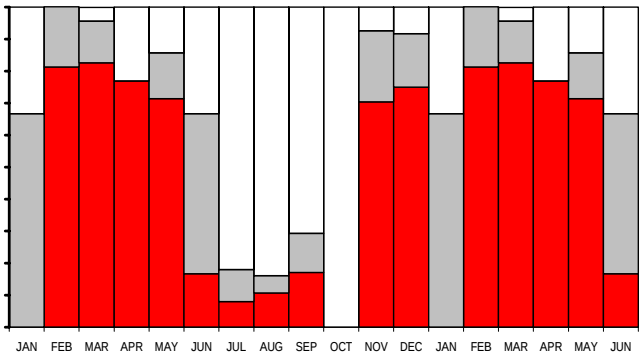
Other Common Names: Smartrose, Vlei Rose, *Vleirosie.*
Other Scientific Names: *None.*

354 Records

Population (330 records): 2% Abundant, 38% Common, 45% Frequent, 14% Rare.
Dispersion (243 records): 65% variable, 34% clumped.
Flowering (260 records with: Jan 3, Feb 19, Mar 23, Apr 13, May 7, Jun 6, Jul 51, Aug 56, Sep 41, Oct 1, Nov 29, Dec 11): Buds from Aug to Sep; Flowering from Sep; Peak Flowering and Over not significant; Fruit from Oct to Jun; Nothing from Apr and Jun to Jul. Peak levels at 93% in Sep. Historically recorded as flowering from Sep to Oct, fruit ripen 6 months later and are shed.



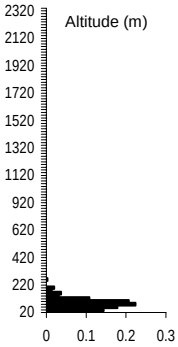
Growth (255 records with: Jan 3, Feb 16, Mar 23, Apr 13, May 7, Jun 6, Jul 50, Aug 56, Sep 41, Oct 1, Nov 27, Dec 12): Much from Nov to May; Rare from Jan, Jun and Nov; None from Jan, Apr, and Jun to Oct. Peak levels at 100% in Feb.



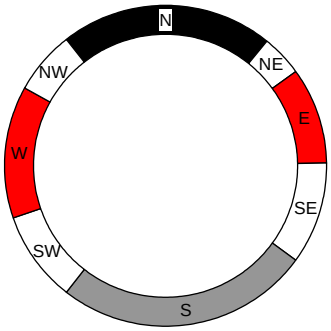
Seedlings (79 records): All without any seedlings present.
Fire Survival (4 records): 50% eliminated from the area by fires, 50% survived by seedlings only.
Age to first flowering: First flowers recorded at 100% at 6 years, no data from younger veld other than 0% at 1 year.

Height (261 records): 2% 0-0.2 m tall, 44% 0.2-1 m tall, 52% 1-2 m tall, 3% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (353 records): 98% inland - further than 2 km from coast.
Altitude (353 records): 20 - 260 m; 40 $_{lq}$ - 60 $_{med}$ - 80 $_{uq}$m.



Landform (295 records): 79% deep soil, 12% swamp, 5% riverine, 4% shallow soil.
Slope (276 records): 48% gentle incline, 34% platform, 16% valley bottom, 1% hill top.
Aspect (173 records): 35% South, 27% North, 21% West, 17% East.



Soil Type (261 records): 38% loamy, 32% clayey, 26% sandy, 3% gravelly.
Soil Colour (259 records): 59% brown, 26% grey, 8% orange, 4% white, 2% black.
Geology (286 records): 46% shale, 33% silcrete or ferricrete, 20% sandstone, 1% Tertiary sands.
Vegetation (348 records): 99% shrubland.

Conservation Status and Threat:
Red Data List Status: Endangered A2c.
Occurrence (Fynbos): 1 120 km^2 with 5% conserved and 37% lost; Occupancy: 393 km^2 with 7% conserved and 53% lost. Fragmentation index: 30%.
Nature Reserves (353 records): 9% in Nature Reserves - inadequately conserved.
Habitat destruction (268 records): 47% extensive natural habitat, 24% islands, 19% road verges, 6% naturally linear habitats, 3% naturally fragmented habitats, 1% corridors.

Alien Invasive Species (260 records):
74% Fabaceae (chiefly alien *Acacia*), 12% none, 8% *Pinus*, 5% Myrtaceae.
Alien Density (260 records): 12% alien-free, 47% sparse, 27% abundant, 12% dense, 2% impenetrable.

Cultivation & Utilization:
Picking (214 records): 97% no sign of picking, 2% lightly picked, 0.9% severely picked.
Cultivation Status: Augmentations - 1 record.

Atlassers Notes:
Some local thickets of HC4: over 2 m (SMRY0081611);
Growing on fallow agricultural land (LYM98091103); Seems capable of surviving amongst Kikuyu in old meadow as it resprouts (NAHY0051801);
Gone! Without a trace! (AGR98042201);
Lightly grazed (NGF96072812);
Picked – but evidence hard to see (AGR92032601);
Lesser Double Collared Sunbirds visiting (LYMY0081602);
Proteas in clear zonation around vleilet: *L. xanthoconus* closest, then *laxum* (AGR98060619);

Confusing Species: A single misidentification with *L. corymbosum*, which is superficially quite similar
Records of identification queries = 2.
Records of corrected identification queries = 1.

Variation and Taxonomy: No variation known.

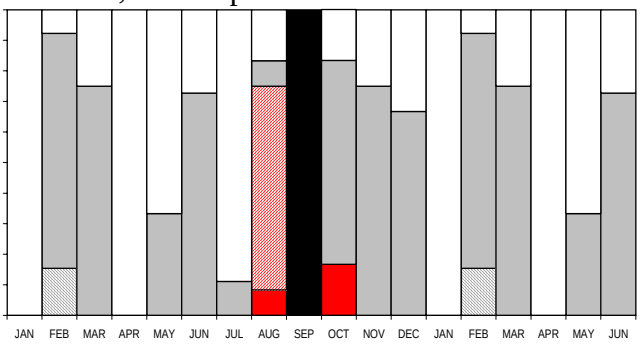
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDLAXU_m.jpg" * MERGEFORMAT \d

Leucadendron verticillatum (Thunb.) Meisn. 1803, 1856
Klapmuts Conebush

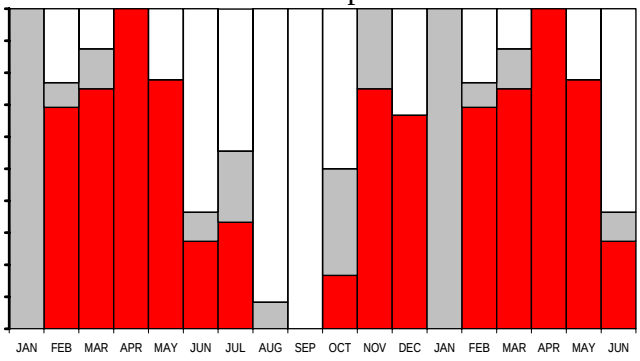
Other Common Names: None known.
Other Scientific Names: *cinereum* R.Br. 1810.

83 Records

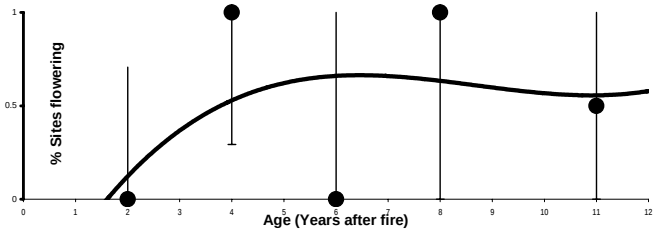
Population (78 records): 32% Common, 62% Frequent, 6% Rare.
Dispersion (76 records): 53% variable, 41% clumped, 7% evenly distributed.
Flowering (82 records with: Jan 1, Feb 13, Mar 8, Apr 2, May 9, Jun 11, Jul 9, Aug 12, Sep 1, Oct 6, Nov 4, Dec 6): Buds from Aug; Flowering from Oct; Peak Flowering from Sep; Over not significant; Fruit from Oct to Jun; Nothing from Nov to Jan and Mar to Jul. Peak levels unreliable at 75% in Aug. Historically recorded as flowering from Sep to Oct, fruits ripen in Feb and are shed.



Growth (82 records with: Jan 1, Feb 13, Mar 8, Apr 2, May 9, Jun 11, Jul 9, Aug 12, Sep 1, Oct 6, Nov 4, Dec 6): Much from Nov to Jul; Rare from Jul and Oct to Nov; None from Feb and May to Oct and Dec. Peak levels unreliable at 100% in Apr.

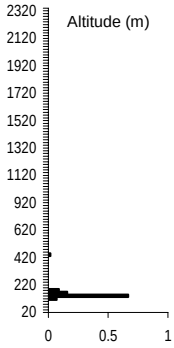


Seedlings (34 records): Absent in 65%: fewer seedlings than prefire adults in 1 case, and more in 5 cases. Seedlings found in Mar (2), May, Jun, Jul and Aug.
Fire Survival (3 records): 67% eliminated from the area by fires, 33% survived by seedlings only.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-11 years, and 100% consistently recorded at 13 years and older.

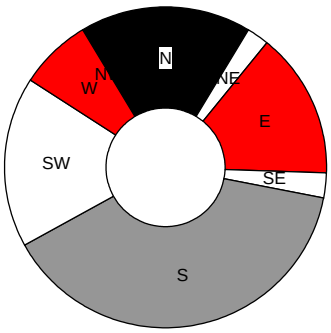


Height (80 records): 3% 0-0.2 m tall, 10% 0.2-1 m tall, 83% 1-2 m tall, 5% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (57 records): 100% inland - further than 2 km from coast.
Altitude (57 records): 100 - 440 m; 120 *lq* - 140 *med* - 140 *uq*m.



Landform (55 records): 95% deep soil, 5% shallow soil.
Slope (54 records): 70% gentle incline, 20% platform, 7% hill top, 2% steep incline.
Aspect (41 records): 45% South, 20% West, 18% North, 17% East.



Soil Type (55 records): 44% loamy, 35% clayey, 22% sandy.
Soil Colour (55 records): 49% brown, 35% grey, 9% orange, 4% white, 2% yellow, 2% red.
Geology (48 records): 46% shale, 19% sandstone, 19% granite, 17% silcrete or ferricrete.
Vegetation (54 records): 91% shrubland, 7% agricultural lands, 2% grassland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A2c, B1b(i,ii,iii,iv)c(iv).
Occurrence (Fynbos): 30 km^2 with 1% conserved and 67% lost; Occupancy: 34km^2 with 1% conserved and 66% lost. Fragmentation index: 40%.
Nature Reserves (57 records): 21% in Nature Reserves.
Habitat destruction (54 records): 39% islands, 30% road verges, 24% extensive natural habitat, 4% corridors, 2% patches, 2% naturally fragmented habitats.
Alien Invasive Species (53 records): 75% Fabaceae (chiefly alien *Acacia*),

13% *Pinus*, 9% none, 2% annual alien grasses.
Alien Density (53 records): 9% alien-free, 64% sparse, 13% abundant, 8% dense, 6% impenetrable.

Cultivation & Utilization:
Picking (65 records): 98% no sign of picking, 2% severely picked.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Most of colony is dead by fire - few young coming up (AGR99121501); Some 2/3 population burnt out 6 months ago: seedlings present as well as young plants (AKS94073001); Note : 70 - 80 % of this population burned (accidentally) on 1999/02/25 (NAH99022001); 200-300 plants in need of burning (SMRY3022601);
Occurring in road verge not in adjacent veld: only where sandstone over shale but more edge of it! (ASP94072702); Counted 19 seedlings not seen previously (HCA93060301); 7 adult plants, 6 dead adults and ca 35 young plants and seedlings: highly vulnerable - surrounded by dense *Acacia saligna* (NAH92052201); This fairly widespread population of about 40 plants is severely threatened by *Acacia saligna* and squatters (NAH98080401); This population is severely threatened by *Acacia saligna* and is within years of being smothered: conservation action even a fire is necessary as it is one of the biggest populations of this endangered species (NAH98080402); Less than 20 plants in a 20 m stretch of road verge (SHR97032101);
Grazed (CHE97061202); Some damage to plants by ?cattle (NAH92052201);
Weaver birds building nests in plants (LYM97111902);
Growing in ploughed lands! Either recently ploughed for first time or this is a weedy species! Spreading from mature plants on edge! (ASP95081007);

Confusing Species: Misidentified as *L. levisanus* which it superficially resembles (although it more resembles *L. cinereum*, but has distinct seeds, cones and flowers, and leaves less narrowed at base). Also misidentified in an Environmental Impact Assessment as *L. stellare,* which is completely different.
Records of identification queries = 1.
Records of corrected identification queries = 1.

Variation and Taxonomy: No variation noted.

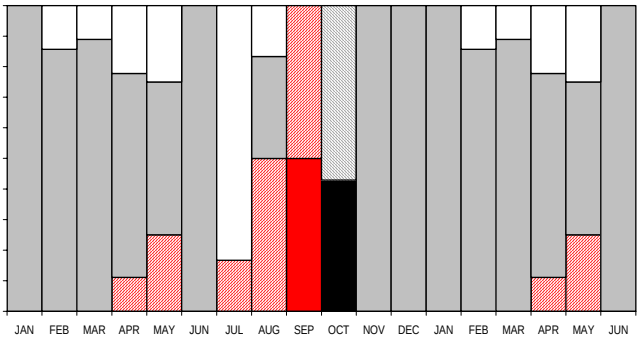
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDVERT_m.jpg" * MERGEFORMAT \d

Leucadendron floridum R.Br. 1810
Flats Conebush

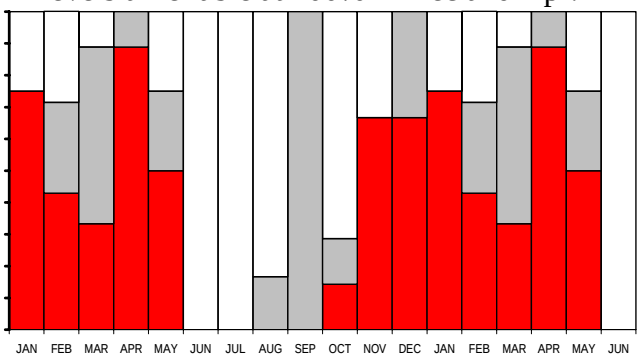
Other Common Names: Silky Euryspermum, Sunny, *Tolbos, Florida.*
Other Scientific Names: *conifera* (L.) 1762, *saligna* (Thunb.) 1781, *sericeum* (Salisb. ex Knight) 1809.

63 Records

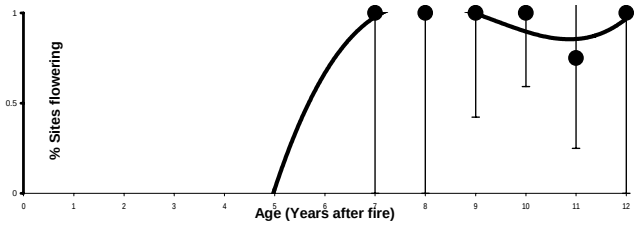
Population (58 records): 21% Common, 40% Frequent, 36% Rare, 3% Extinct.
Dispersion (52 records): 58% clumped, 31% variable, 10% evenly distributed, 2% widespread.
Flowering (61 records with: Jan 4, Feb 7, Mar 9, Apr 9, May 4, Jun 1, Jul 6, Aug 6, Sep 2, Oct 7, Nov 3, Dec 3): Buds from May and Aug to Sep; Flowering from Sep; Peak Flowering from Oct; Over from Oct; Fruit from Nov to Jun and Aug; Nothing from Apr to May and Jul. Peak levels unreliable at 100% from Sep to Oct. Historically recorded as flowering from Sep to Oct, fruits ripen after 6 months and – uncharacteristically for the section and subsection - are shed a month later.



Growth (61 records with: Jan 4, Feb 7, Mar 9, Apr 9, May 4, Jun 1, Jul 6, Aug 6, Sep 2, Oct 7, Nov 3, Dec 3): Much from Nov to May; Rare from Feb, Mar, May, Sep and Dec; None from Jan to Feb and May to Nov. Peak levels unreliable at 100% in Dec and Apr.

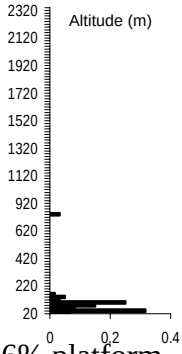


Seedlings (26 records): Absent in 62%: fewer seedlings than prefire adults in 4 cases, and more in 1 case. Seedlings found in Feb, Mar (2), Aug and Sep.
Fire Survival (1 record): 100% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 100% at 7 years, no data from younger veld.

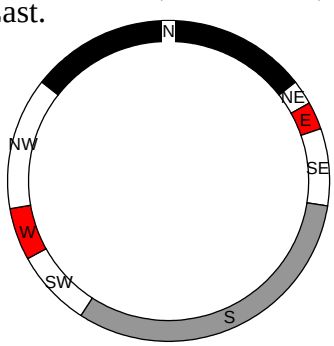


Height (60 records): 18% 0.2-1 m tall, 78% 1-2 m tall, 3% 2-5 m tall.
Pollinators (1 record): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (55 records): 64% inland - further than 2 km from coast.
Altitude (55 records): 20 - 740 m; 20 $_{lq}$ - 40 $_{med}$ - 40 $_{uq}$m.



Landform (54 records): 70% deep soil, 20% swamp, 7% riverine, 2% lake edge.
Slope (54 records): 41% gentle incline, 31% valley bottom, 26% platform, 2% steep incline.
Aspect (35 records): 40% North, 37% South, 16% West, 7% East.



Soil Type (54 records): 63% sandy, 26% loamy, 11% peaty.
Soil Colour (54 records): 65% grey, 19% black, 11% brown, 6% white.
Geology (54 records): 100% sandstone.
Vegetation (54 records): 98% shrubland, 2% thicket.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A2c.
Occurrence (Fynbos): 171 km^2 with 60% conserved and 28% lost; Occupancy: 28 km^2 with 86% conserved and 7% lost. Fragmentation index: 15%.
Nature Reserves (55 records): 95% in Nature Reserves - well conserved.
Habitat destruction (53 records): 89% extensive natural habitat, 11% naturally linear habitats.
Alien Invasive Species (54 records): 74% Fabaceae (chiefly alien *Acacia*), 22% none, 2% *Pinus*, 2% other aliens.
Alien Density (54 records): 22% alien-free, 74% sparse, 4% abundant.

Cultivation & Utilization:

Picking (48 records): 98% no sign of picking, 2% lightly picked.
Cultivation Status: Plantings - 4 records (6%), Escapes - 1 record (2%).

Atlassers Notes:
Table Mountain population:
L. uliginosum planted or escaped - (LYM96080401); This has been atlassed as both *L. floridum* and *uliginosum:* gizz is former with some features of latter - possibly a Kirstenbosch hybrid? (AGRY0012501);
Other populations:
4 dead plants seen with live plant - seeds released (AGR99101014); All dead - remains of 2 females and 2 males - only 1 was alive this time last year but other skeletons still present (AGRY4041110); 6 female and 13 male (CNR95101902); Population comprises 2 females and 1 male (CRS95020803); Population consists of 4 males and 3 females (CRS95021702); Population consists of 2 small clumps of plants 1 female on outer extremities of study site (CRS95031301); Both individuals appear to be half dead! both are male (CRS95031302); 2 parent plants, both female (CRS95031303); There may be more young plants in fairly dense growth (CVV96030802); One south of road, others north (CVV97090501); 2 dead (CVV97090501); Main clump north of jeep track to ruin and 30m from tar road (JID94101610); Many of the plants had branches that were dead or dying (LYM95041601); About 40 plants in 3 small subpopulations (NAH98070701); 5 dead plants were seen (not killed by fire - other causes) (NGF94071702); Moribund (OUTY0110503); None seen ! (PMR98031901); 3 males and 2 females (TLE96101903); A few dead plants also seen (WIJ94101606);
Reestablished by D. Clarke a few years back after dense wattle thicket cleared (AGR91112404); These 2 plants are the only surviving ones of stock allowed to germinate there by Roger Gray the land owner about 7 yrs ago. One is from the original stock and the other is probably a 3 year old seedling from that stock. All the others (about 10) that germinated and grew have since died (NAH99041401);
Some individuals on road side of fence but these are prone to herbicidal spray from roads department (CRS94092201);
Most cones have lost seed (CVV96030801);

Confusing Species: Confused with *L. macowanii* (leaves hairless, *Acacia*-like), *coniferum* (leaves hairless, fruit broadly winged) and *uliginosum* (which has short adpressed hairs – not silky – leaves and branches, planted plants causing the problem).
Records of identification queries = 11.
Records of corrected identification queries = 4.

Variation and Taxonomy: Did not appear to vary significantly.
Phillips and Hutchinson did not distinguish between *L.floridum* and *uliginosum*, and thus the two were confused well into the 1960s, with *L. uliginosum* being present in Peninsula species lists of the time.

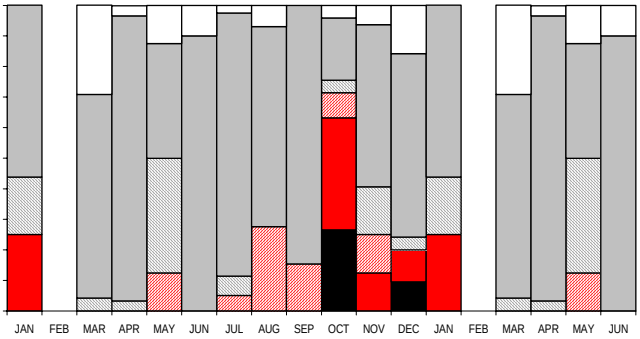
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDFLOR_m.jpg" * MERGEFORMAT \d

Leucadendron loeriense Williams 1967
Loerie Conebush
Loerietolbos

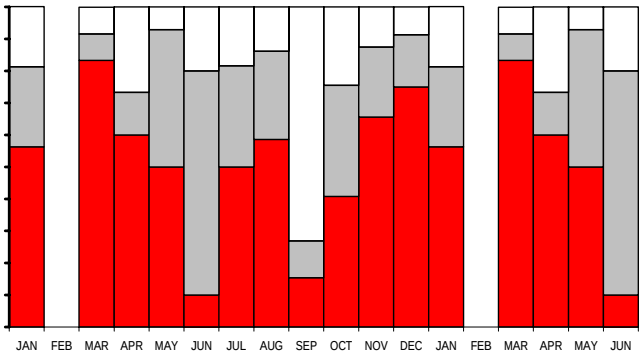
Other Common Names: None known.
Other Scientific Names: None.

445 Records

Population (434 records): 6% Abundant, 50% Common, 32% Frequent, 12% Rare.
Dispersion (407 records): 52% variable, 28% clumped, 17% widespread, 3% evenly distributed.
Flowering (406 records with: Jan 16, Feb 0, Mar 24, Apr 30, May 16, Jun 10, Jul 79, Aug 29, Sep 26, Oct 49, Nov 32, Dec 95): Buds from Aug; Flowering from Jan and Oct; Peak Flowering from Oct; Over from May; Fruit from all year round; Nothing from Mar. Peak levels at 76% in Oct. Historically recorded as flowering from Dec to Jan, fruits retained.



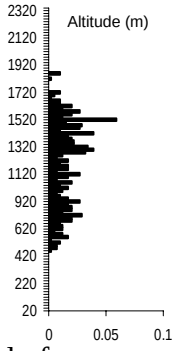
Growth (398 records with: Jan 16, Feb 0, Mar 24, Apr 30, May 14, Jun 10, Jul 76, Aug 29, Sep 26, Oct 49, Nov 32, Dec 92): Much from Oct to May and Jul to Aug; Rare from Jan, May to Aug and Oct to Nov; None from Apr, Jun, and Sep to Oct. Peak levels at 91% in Dec and Mar.



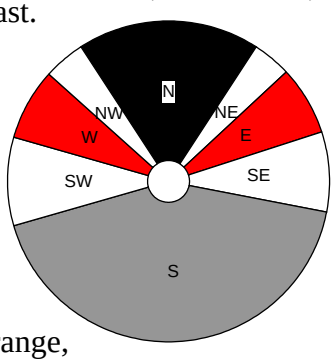
Seedlings (268 records): Absent in 94%: more seedlings than prefire adults in 8 cases. Seedlings found in Mar, May, Jun, Oct (4) and Dec.
Fire Survival (52 records): 52% survived by seedlings only, 33% escaped fires in fire-safe areas, 13% eliminated from the area by fires, 2% resprouted from underground boles.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% recorded at 6 years.

Height (408 records): 4% 0-0.2 m tall, 10% 0.2-1 m tall, 55% 1-2 m tall, 29% 2-5 m tall, 1% taller than 5 m.
Pollinators (2 records): 50% flies, 50% beetles.
Detailed Pollinators (1 record): Monkey Beetle.

Habitat:
Distance to Ocean (408 records): 100% inland - further than 2 km from coast.
Altitude (408 records): 440 - 1760 m; 800 *lq* - 1120 *med* - 1320 *uq*m.



Landform (399 records): 50% deep soil, 45% shallow soil, 4% rocky outcrops.
Slope (401 records): 60% steep incline, 28% gentle incline, 11% hill top, 1.0% cliff, 0.7% platform.
Aspect (362 records): 52% South, 23% North, 13% West, 12% East.



Soil Type (393 records): 60% loamy, 21% sandy, 12% rocky, 5% gravelly, 2% clayey.
Soil Colour (393 records): 54% grey, 41% brown, 2% orange, 1% black.
Geology (374 records): 99% sandstone, 1% shale.
Vegetation (402 records): 85% shrubland, 8% plantations, 6% grassland, 1% thicket.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 3 138 km^2 with 57% conserved and 3% lost; Occupancy: 443 km^2 with 67% conserved and 7% lost. Fragmentation index: 6%.
Nature Reserves (408 records): 52% in Nature Reserves - well conserved.
Habitat destruction (387 records): 88% extensive natural habitat, 10% islands, 2% naturally linear habitats.
Alien Invasive Species (371 records): 74% none, 24% *Pinus*, 1% Fabaceae (chiefly alien *Acacia*).

Alien Density (371 records): 74% alien-free, 11% sparse, 8% abundant, 7% dense.

Cultivation & Utilization:
Picking (303 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.
Witch's Broom Infestation: 1 record (0.2%).

Atlassers Notes:
The new growth at the ends of the branches glows a peachy red in the sunlight - an absolutely wonderful sight (MCG97120603);
In spite of being listed as 'rare' in the book is extremely common all over this area (MCG96082403); In parts so thick as to be impenetrable (MCG96082501); The *L. loeriense* jungle is a sight to see (MCG97120603);
Small brown spiders spun webs inside young new leaves and laid eggs - ants also seen (BMJ96071401);

Confusing Species: Considerable confusion was caused by the key in Williams (1972). Although specimens key out to *L. uliginosum* subsp. *uliginosum* (3 % of errors), this is clearly incorrect as was the plants are not silver, and the subsp. *glabratum* was usually (93%) selected instead, even though the leaves are too long and hairy. In 4% of cases, atlassers did not venture a subspecies. A single case of misidentification with *L. spissifolium* was noted (but with subspecies *spissifolium* which is utterly distinct – a hairless resprouter with large cones!).
Records of identification queries = 179.
Records of corrected identification queries = 163.

Variation and Taxonomy: William's description of the habit is incorrect: plants from the type locality exceed 2m tall. The key to the subsection, should therefore have *L. loeriense* inserted into couplet 5*, with the following shared features: Leaves 35m long, male perianth limb, and the separating features being: leaves with erect pubescence for *L.loeriense* and leaves with adpressed-silvery pubescence for *L.uliginosum* subsp. *uliginosum.* Some populations are glabrescent, and in a few the female cones do not develop the characteristic red blush, but otherwise it does not appear to be very variable.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDLOER_m.jpg" * MERGEFORMAT \d

Leucadendron uliginosum subspecies *uliginosum* R.Br. 1810

Outeniqua Conebush

Silwerbos

Other Common Names: Silverbush, Silvery Euryspermum, *Duineknoppiesbos, Knoppiesbos, Knoppiestolbos, Kraaltolbos, Tolletjiesbos.*

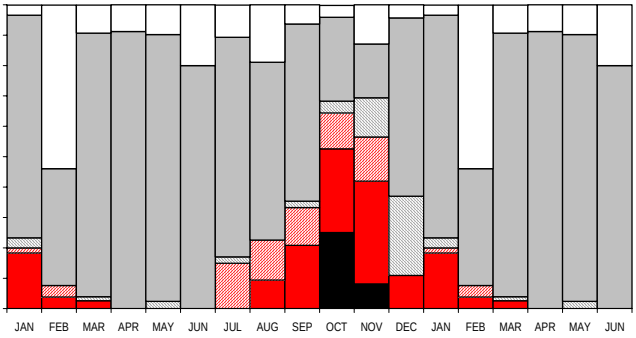
Other Scientific Names: *argenteum* (Salisb. ex Kn.) 1809, *concinnum* (Salisb.) 1796, *salignum* (Thunb.) 1781.

646 Records

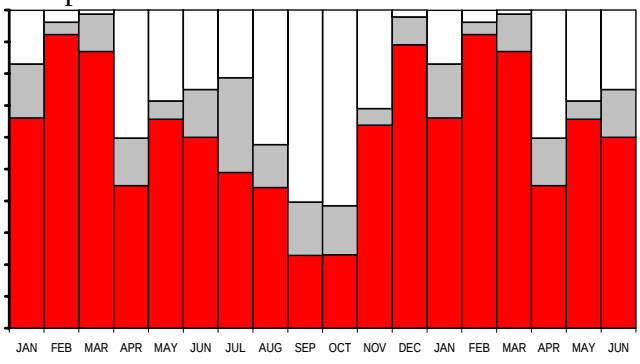
Population (630 records): 9% Abundant, 43% Common, 41% Frequent, 6% Rare.

Dispersion (598 records): 44% variable, 31% widespread, 18% clumped, 7% evenly distributed.

Flowering (623 records with: Jan 60, Feb 26, Mar 76, Apr 68, May 41, Jun 20, Jul 47, Aug 53, Sep 48, Oct 76, Nov 62, Dec 46): Buds not significant; Flowering from Sep to Nov; Peak Flowering from Oct; Over from Dec; Fruit from Dec to Oct; Nothing from Feb and Jun. Peak levels at 69% in Nov. Historically recorded as flowering from Nov, fruit retained.



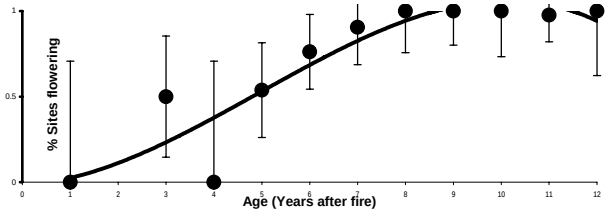
Growth (600 records with: Jan 59, Feb 26, Mar 77, Apr 67, May 35, Jun 20, Jul 47, Aug 52, Sep 48, Oct 65, Nov 58, Dec 46): Much from all year round; Rare from Jul; None from Apr to Nov. Peak levels at 99% in Mar.



Seedlings (215 records): Absent in 69%: fewer seedlings than prefire adults in 20 cases, and more in 13 cases. Seedlings found in Jan (2), Feb (6), Mar, Jun, Jul (9), Aug (5), Sep (7), Oct and Nov.

Fire Survival (40 records): 80% survived by seedlings only, 10% eliminated from the area by fires, 10% escaped fires in fire-safe areas.

Age to first flowering: First flowers recorded at 3 years, 50% estimated at 3-5 years, and 100% recorded at 8 years.



Height (635 records): 3% 0-0.2 m tall, 15% 0.2-1 m tall, 50% 1-2 m tall, 32% 2-5 m tall.

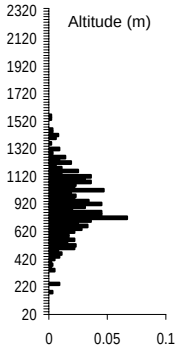
Pollinators (5 records): 40% birds, 40% beetles, 20% none observed.

Detailed Pollinators (2 records): Orange-breasted Sunbird.

Habitat:

Distance to Ocean (628 records): 100% inland - further than 2 km from coast.

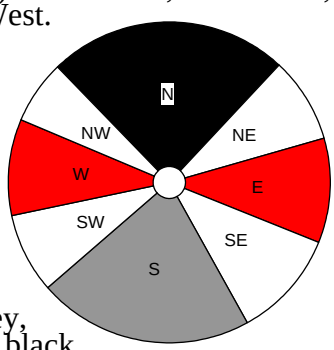
Altitude (628 records): 320 - 1460 m; 660 *lq* - 780 *med* - 920 *uq* m.



Landform (625 records): 77% deep soil, 20% shallow soil, 2% rocky outcrops.

Slope (626 records): 50% steep incline, 41% gentle incline, 5% hill top, 2% platform, 1% cliff, 0.5% valley bottom.

Aspect (584 records): 32% North, 32% South, 20% East, 16% West.



Soil Type (624 records): 47% loamy, 37% sandy, 7% peaty, 5% gravelly, 3% clayey, 1% rocky.

Soil Colour (624 records): 41% grey, 28% brown, 27% black, 3% orange, 0.8% white, 0.8% yellow.

Geology (624 records): 91% sandstone, 9% shale.

Vegetation (625 records): 99% shrubland, 1% plantations.

Conservation Status and Threat:

Red Data List Status: Least Concern.

Occurrence (Fynbos): 2 382 km^2 with 22% conserved and 19% lost; Occupancy: 510 km^2 with 43% conserved and 13% lost. Fragmentation index: 18%.

Nature Reserves (628 records): 62% in Nature Reserves - well conserved.

Habitat destruction (607 records): 96% extensive natural habitat, 3% islands.

Alien Invasive Species (622 records): 34% *Hakea*, 33% *Pinus*, 29% none, 4% Fabaceae (chiefly alien *Acacia*).
Alien Density (622 records): 29% alien-free, 60% sparse, 7% abundant, 4% dense.

Cultivation & Utilization:
Picking (374 records): 99% no sign of picking, 0.5% lightly picked.
Cultivation Status: Plantings - 13 records (2%).

Atlassers Notes:
Very interesting! In amongst stands of very definite *L. uliginosum* subsp. *uliginosum* was a solitary male specimen with greener and hairless leaves. What an excellent chance to compare the two subspecies! But why only one specimen? <*considered a sport*>- (DFJ99012602); Note: subspecies *glabratum* possibly also sighted, but not confirmed. Planning a return visit … (OUT93082101);
Abundant: needs family planning (AWA98111706); In spite of very dry conditions young plants were all thriving. Were they responding as if there had just been a fire ? (DFJ96062902); Particularly healthy and dense stand along path to this hiking trail hut - no fire for a long time it seems (DFJ96062903);
Plants dead (OUT98013102); Recently dead (OUT99050704);
Vast stands at entrance to reserve in bud, 0.5 km up road in full bloom, then higher up [this SRS] again as at gate. Why the difference? (AWA94102501);
With dense patches of fire-killed adult plants (height about 2 m) but poor post-fire regeneration (SGAY0121306);

Confusing Species: Some confusion was caused by Meisner (1956) not realizing the difference between *L.floridum* and *uliginosum*, and Phillips and Hutchingson (1912) not recognizing *L.floridum* as a different species. Also due to an identification error for a voucher specimen, Muir (1929) referred to *L. meridianum* as *uliginosum*., resulting in further confusion in the literature.
Atlassers occasionally reported both subspecies together or muddled them (40% of errors). One atlasser identified the species as *L. album*, based on the silver leaves. A misidentification with *L. conicum* was also noted.
Records of identification queries = 25.
Records of corrected identification queries = 17.

Variation and Taxonomy: All three older names were already occupied in *Leucadendron* and thus could not be applied.
No variation known.

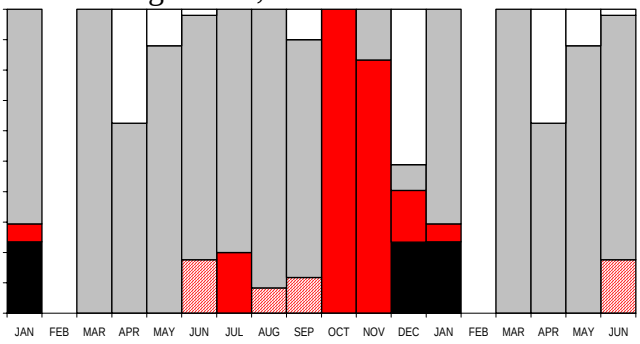
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDULIGU_m.jpg" * MERGEFORMAT \d

Leucadendron uliginosum subspecies *glabratum* Williams 1972
Tsitsikamma Conebush

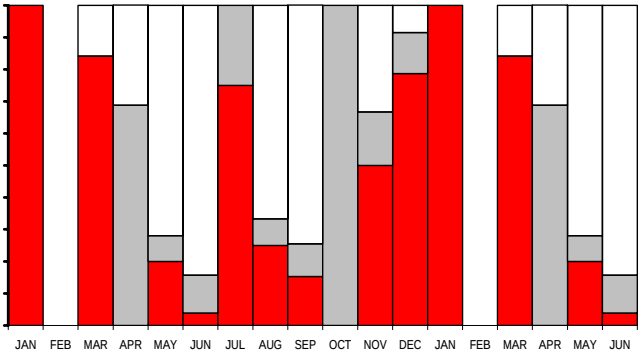
Other Common Names: Ugi, *Geeltolbos.*
Other Scientific Names: *None.*

268 Records

Population (266 records): 6% Abundant, 57% Common, 31% Frequent, 6% Rare.
Dispersion (258 records): 67% variable, 16% clumped, 15% widespread, 2% evenly distributed.
Flowering (260 records with: Jan 17, Feb 0, Mar 19, Apr 16, May 25, Jun 51, Jul 5, Aug 12, Sep 60, Oct 2, Nov 6, Dec 47): Buds from Jun; Flowering from Oct to Nov; Peak Flowering from Dec to Jan; Over not recorded; Fruit from Jan to Sep; Nothing from Apr and Dec. Peak levels unreliable at 100% in Oct. Historically recorded as flowering in Dec, fruits retained.



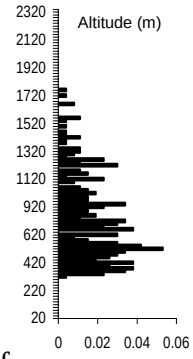
Growth (258 records with: Jan 17, Feb 0, Mar 19, Apr 16, May 25, Jun 51, Jul 4, Aug 12, Sep 59, Oct 2, Nov 6, Dec 47): Much from Nov to Mar, May and Jul to Aug; Rare from Apr, Jul and Oct; None from Apr to Nov. Peak levels unreliable at 100% in Jan.



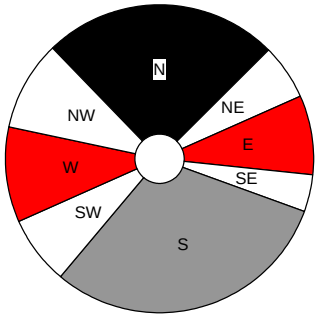
Seedlings (118 records): Absent in 93%: fewer seedlings than prefire adults in 3 cases, and more in 1 case. Seedlings found in Jun (2), Jul and Sep.
Fire Survival (14 records): 57% survived by seedlings only, 21% eliminated from the area by fires, 21% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 3-6 years, and 100% recorded consistently after 8 years.

Height (265 records): 3% 0-0.2 m tall, 25% 0.2-1 m tall, 33% 1-2 m tall, 39% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (264 records): 100% inland - further than 2 km from coast.
Altitude (264 records): 300 - 1660 m; 480 *lq* - 660 *med* - 840 *uq*m.



Landform (264 records): 76% deep soil, 19% shallow soil, 5% rocky outcrops.
Slope (263 records): 49% steep incline, 35% gentle incline, 11% hill top, 2% cliff, 2% platform.
Aspect (231 records): 37% South, 32% North, 17% West, 13% East.



Soil Type (261 records): 65% loamy, 19% sandy, 10% peaty, 4% rocky, 2% clayey.
Soil Colour (262 records): 39% grey, 30% brown, 29% black, 2% red.
Geology (261 records): 93% sandstone, 7% shale.
Vegetation (264 records): 92% shrubland, 6% plantations, 2% grassland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 926 km^2 with 74% conserved and 3% lost; Occupancy: 222 km^2 with 55% conserved and 4% lost. Fragmentation index: 22%.
Nature Reserves (264 records): 58% in Nature Reserves - well conserved.
Habitat destruction (260 records): 97% extensive natural habitat, 3% islands, 0.4% corridors.
Alien Invasive Species (263 records): 59% *Pinus*, 30% *Hakea*, 9% none, 2% Fabaceae (chiefly alien *Acacia*).
Alien Density (262 records): 9% alien-free, 66% sparse, 21% abundant, 3% dense.

Cultivation & Utilization:
Picking (178 records): 100% no sign of picking.
Cultivation Status: Plantings - 1 record.

Atlassers Notes:
Leaves appeared silvery and the cones green not red/ brown (BMJ96072104); Is hairy although not silver - quite green (DFJ99050201);
Were growing hard from the bottom - is this because there has not been a fire here for some time? (PVR97092008);
A very exposed and windy slope but still the plants manage HC3 ?? (DFJ97050406);

Confusing Species: Mainly confused with subsp.. *uliginosum* when in new growth or when hairs persistent, but hairs are not silver. One instance of misidentification with *L. album* which is quite a different plant.
Records of identification queries = 19.
Records of corrected identification queries = 17.

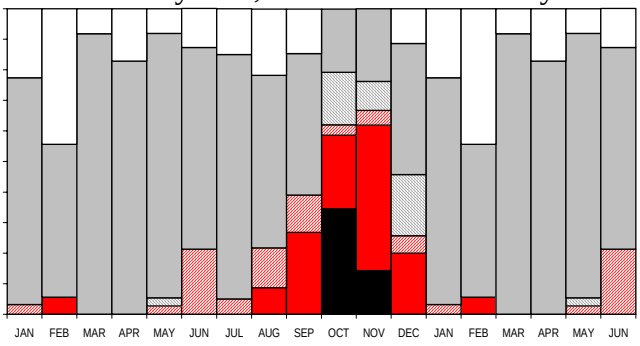
Variation and Taxonomy: No variation noted.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDULIGG_m.jpg" * MERGEFORMAT \d

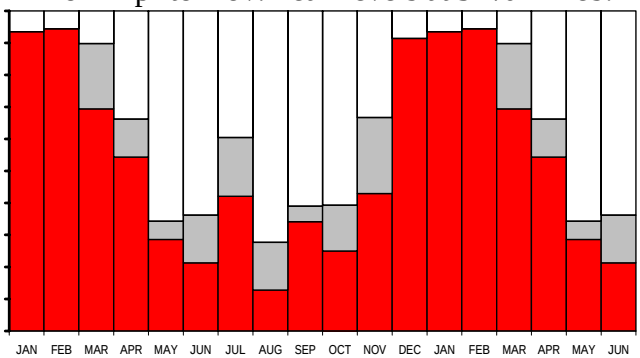
Leucadendron conicum (Lam.) Williams 1791, 1967
Garden-Route Conebush
Vaaltolbos

Other Common Names: Grey Conebush, Ruby-cone Conebush, *Grystolbos, Robyntol.*
Other Scientific Names: *conifera* Poir 1804, *ramosissimum* Buek ex Meisn 1856.

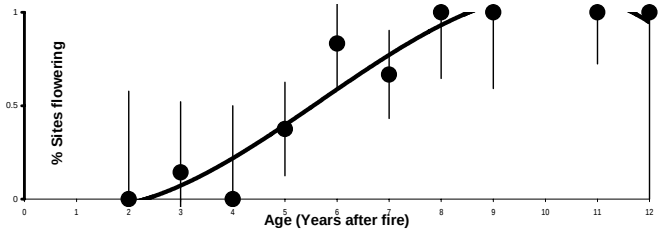
475 Records
Population (472 records): 2% Abundant, 28% Common, 59% Frequent, 11% Rare.
Dispersion (447 records): 45% clumped, 40% variable, 11% widespread, 5% evenly distributed.
Flowering (464 records with: Jan 31, Feb 18, Mar 49, Apr 70, May 37, Jun 47, Jul 40, Aug 46, Sep 41, Oct 29, Nov 21, Dec 35): Buds from Jun; Flowering from Sep to Dec; Peak Flowering from Oct; Over from Dec; Fruit from all year round; Nothing from Jan to Feb and Aug. Peak levels at 79% in Oct. Historically recorded as flowering from late Oct to early Nov, fruit retained for 1-2 years.



Growth (458 records with: Jan 31, Feb 18, Mar 49, Apr 68, May 35, Jun 47, Jul 38, Aug 47, Sep 41, Oct 28, Nov 21, Dec 35): Much from Sep to Jul; Rare from Mar and Nov; None from Apr to Nov. Peak levels at 94% in Feb.

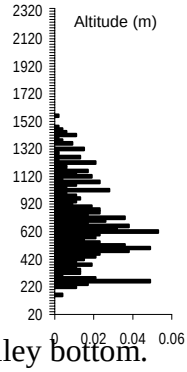


Seedlings (172 records): Absent in 87%: fewer seedlings than prefire adults in 5 cases, and more in 6 cases. Seedlings found in Jan (2), Feb, Jun (3), Jul, Aug, Sep, Nov and Dec.
Fire Survival (19 records): 89% survived by seedlings only, 5% eliminated from the area by fires, 5% resprouted from underground boles.
Age to first flowering: First flowers recorded at 3 years, 50% estimated at 5-6 years, and 100% recorded at 8 years.

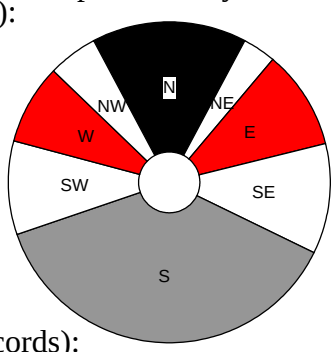


Height (469 records): 2% 0-0.2 m tall, 17% 0.2-1 m tall, 33% 1-2 m tall, 42% 2-5 m tall, 5% taller than 5 m.
Pollinators (2 records): 100% flies.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (469 records): 99% inland - further than 2 km from coast.
Altitude (469 records): 140 - 1460 m; 460 $_{lq}$ - 620 $_{med}$ - 760 $_{uq}$m.



Landform (467 records): 85% deep soil, 9% shallow soil, 3% riverine, 2% rocky outcrops.
Slope (469 records): 44% steep incline, 39% gentle incline, 8% platform, 5% hill top, 3% valley bottom.
Aspect (405 records): 49% South, 20% North, 16% East, 15% West.



Soil Type (446 records): 54% loamy, 22% peaty, 20% sandy, 3% gravelly.
Soil Colour (446 records): 43% black, 28% brown, 26% grey.
Geology (460 records): 93% sandstone, 7% shale.
Vegetation (469 records): 96% shrubland, 3% plantations, 1% thicket.

Conservation Status and Threat:
Red Data List Status: Near Threatened A4c.
Occurrence (Fynbos): 5 890 km^2 with 29% conserved and 18% lost; Occupancy: 547 km^2 with 60% conserved and 16% lost. Fragmentation index: 7%.
Nature Reserves (469 records): 62% in Nature Reserves - well conserved.
Habitat destruction (454 records): 88% extensive natural habitat, 4% road verges, 4% islands, 2% corridors, 2% naturally linear habitats.
Alien Invasive Species (446 records): 46% *Pinus*, 24% *Hakea*, 23% none, 6% Fabaceae (chiefly alien *Acacia*).

Alien Density (446 records): 23% alien-free, 66% sparse, 9% abundant, 2% dense.

Cultivation & Utilization:
Picking (324 records): 99% no sign of picking, 0.6% lightly picked.
Cultivation Status: Plantings - 1 record.

Atlassers Notes:
Trees growing on wet south facing rock face of cutting uniform green - no typical red colouring due to lack of sun (AWA97080701); Green leaves and cones with no red pigment (SHR95092501);
Plants 5-10 m tall (OBK96040711); Thick stem (about 150 mm diam.) and thick branches. Far too few leaves for its size. Very few new cones (AWA96070903);
Recovering from pines - not noticed before as under pines (ASPY2112101); Zillions and Tillions of plants (AWA98012902); Many widespread dead plants about 2m high seedlings in only 1 patch (SGAY0121303);
In riverbed (AWA98103108); Growing in squelchy streambed (MCG96092301); Growing along river bank; Older than rest of plot: 10-15 years (OUT94072303); Most common in wettest area (OUT98082205); In wet stream (VCH98040401);
Full of green beetles - no flowers (AWA97120402); Lots of Sugarbirds roosting in the bushes (VCH98040408);

Confusing Species: Confused with the closely related *L. uliginosum* subsp. *glabratum,* which has an entirely different growth habit and much smaller leaves and *L. salicifolium* which has linear leaves, and hairless flowerheads and basal bracts.
Records of identification queries = 18.
Records of corrected identification queries = 4.

Variation and Taxonomy: Not variable except for one character:
- Plants with a pronounced reddish tinge and basal bracts bright pink from Robinson Pass to Montagu Pass, near George.
- Elsewhere plants green and with yellow basal bracts.

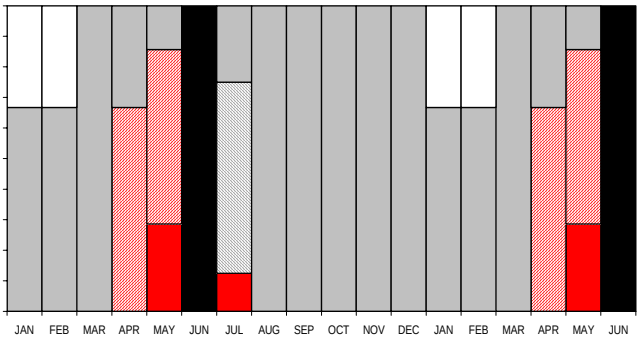
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDCNCM_m.jpg" * MERGEFORMAT \d

Leucadendron macowanii Phill. 1913
Acacia-leaf Conebush

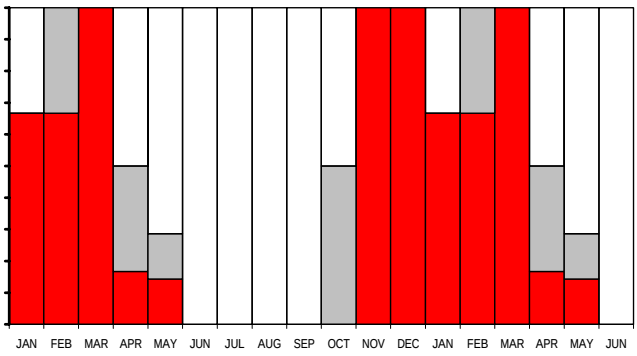
Other Common Names: None known.
Other Scientific Names: None.

39 Records

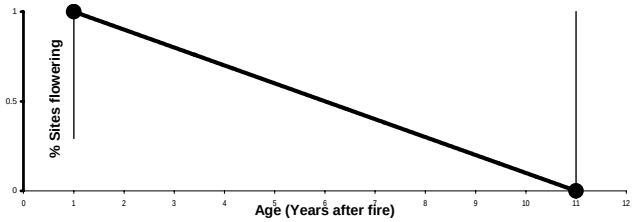
Population (35 records): 3% Common, 69% Frequent, 29% Rare.
Dispersion (34 records): 59% clumped, 35% variable, 6% evenly distributed.
Flowering (39 records with: Jan 3, Feb 3, Mar 2, Apr 6, May 7, Jun 1, Jul 8, Aug 3, Sep 1, Oct 2, Nov 1, Dec 2): Buds from Apr to May; Flowering from May; Peak Flowering from Jun; Over from Jul; Fruit from Jul to Apr; Nothing from Jan to Feb. Peak levels unreliable at 100% in Jun. Historically recorded as flowering from May to Jul, fruit retained.



Growth (39 records with: Jan 3, Feb 3, Mar 2, Apr 6, May 7, Jun 1, Jul 8, Aug 3, Sep 1, Oct 2, Nov 1, Dec 2): Much from Nov to Mar; Rare from Feb, Apr and Oct; None from Jan and Apr to Oct. Peak levels unreliable at 100% in Nov to Dec.

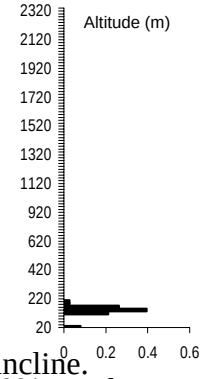


Seedlings (10 records): Absent in 80%: more seedlings than prefire adults in 1 case. Seedlings found in Feb.
Fire Survival : No data.
Age to first flowering: First flowers recorded at 100% at 1 year, additional data from veld less than 11 years old missing.

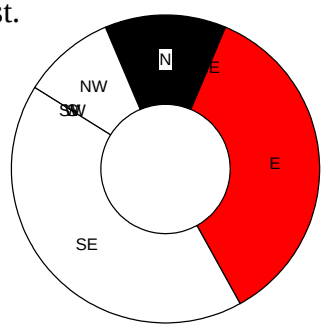


Height (39 records): 3% 0-0.2 m tall, 13% 0.2-1 m tall, 79% 1-2 m tall, 5% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (34 records): 100% coastal - less than 2 km from coast.
Altitude (34 records): 100 - 200 m; 120 $_{lq}$ - 140 $_{med}$ - 140 $_{uq}$m.



Landform (34 records): 56% deep soil, 24% riverine, 18% swamp, 3% rocky outcrops.
Slope (34 records): 68% gentle incline, 15% platform, 12% valley bottom, 6% steep incline.
Aspect (30 records): 57% East, 20% North, 20% South, 3% West.



Soil Type (34 records): 44% sandy, 38% loamy, 18% peaty.
Soil Colour (34 records): 38% grey, 26% black, 26% brown, 9% white.
Geology (33 records): 97% sandstone, 3% shale.
Vegetation (32 records): 88% shrubland, 13% thicket.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A2c, B1a(i)c(iv) + 2a(i)c(iv).
Occurrence (Fynbos): 9 km^2 with 96% conserved and 5% lost; Occupancy: 9 km^2 with 68% conserved and 9% lost. Fragmentation index: 90%.
Nature Reserves (34 records): 68% in Nature Reserves - well conserved.
Habitat destruction (33 records): 48% extensive natural habitat, 42% naturally linear habitats, 9% islands.
Alien Invasive Species (34 records): 68% Fabaceae (chiefly alien *Acacia*), 21% none, 9% *Pinus*, 3% Myrtaceae.
Alien Density (34 records): 21% alien-free, 65% sparse, 9% abundant, 6% dense.

Cultivation & Utilization:
Picking (29 records): 100% no sign of picking.

Cultivation Status: Plantings - 4 records (10%).

Atlassers Notes:
Appears to be exclusively serotinous: many cones showing signs of infestation (galls) similar to Port Jackson (CBE92071801);

The plants were bush-cut in error three years ago it has recovered magnificently and there are now about 20 plants (ANR97082301); The population is both inside and outside the reserve (CBE92071801); Dead tree (CBE93031403); Population Under Threat From Aliens - Both Inside and Outside The Reserve (CNR95041101); Only 1 old female battered by bergies and horse riders - seeds taken from old cones: to be smoked and planted out in reserve - once an extensive population - fence firebreak wiped it out! (*deja vu*) (CNR95050901); Total plants in valley is 12: 6 male and 6 female (CNR95101102); This is the population that was destroyed in 1994 (CRS95021701); According to the reserve warden there should be over 150 plants planted along valley bottom (CVV94050402); Not many more than 10 plants (JAT95080601); Growing right next to fence: population fenced off. I assume they are the planted ones Roy Erntzen told us about (LYM96012001); This reserve population appears to be about 40 plants: all looking healthy. The firebreak killed at most 2 plants, leaving the others untouched (NAH95042701);
About 20 plants present some threatened by aliens (NAH98070801); About 20 plants in total (NAH98070802); One dead plant (PMRY0052001); He also mentioned that seeds that he planted near the dam at Silvermine are thriving (SHR96022401); Between 10 & 20 inside fence (SMR99042107);

Confusing Species: Although very similar to *L. conicum* (red – not purplish – tinged plant, and hairy) and *salicifolium* (smaller leaves and prominent involucral bracts), its localized distribution and rarity prevented any confusion with other species.
Records of identification queries = 3.

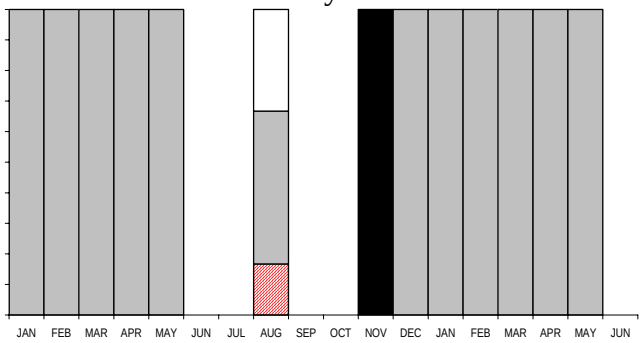
Variation and Taxonomy: No variation known.
The specimen of Wolley-Dod 2924 (K) cited by Phillips is not of this species, but is *L. xanthoconus*.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDMACO_m.jpg" * MERGEFORMAT \d

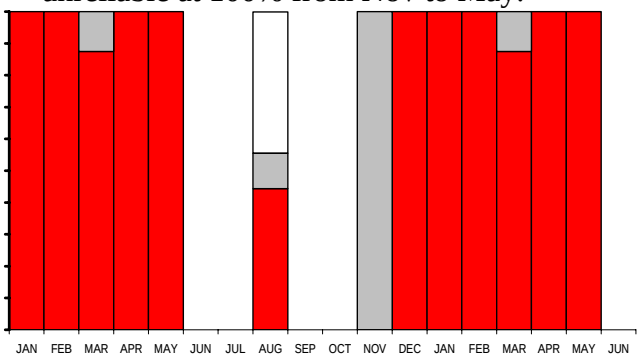
Leucadendron pondoense Van Wyk 1990
Pondoland Conebush
Pondolandtolbos

Other Common Names: Pondo Conebush, Pondoland Streambush.
Other Scientific Names: None.

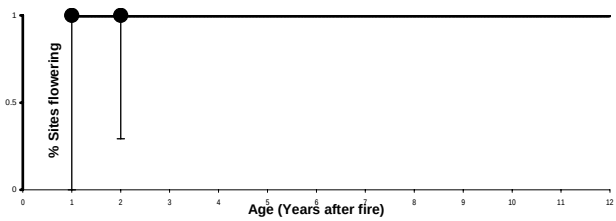
35 Records
Population (35 records): 51% Common, 49% Frequent.
Dispersion (35 records): 51% variable, 34% evenly distributed, 14% clumped.
Flowering (31 records with: Jan 5, Feb 4, Mar 8, Apr 1, May 3, Jun 0, Jul 0, Aug 6, Sep 0, Oct 0, Nov 2, Dec 2): Buds from Aug ; Flowering not recorded; Peak Flowering from Nov; Over not recorded; Fruit from Dec to Aug; Nothing from Aug. Peak levels unreliable at 100% in Nov. Historically recorded as flowering from Sep to Dec, fruit released after about 1 year.



Growth (34 records with: Jan 5, Feb 4, Mar 8, Apr 1, May 3, Jun 0, Jul 0, Aug 9, Sep 0, Oct 0, Nov 2, Dec 2): Much from Dec to Aug; Rare from Nov; None from Aug. Peak levels unreliable at 100% from Nov to May.

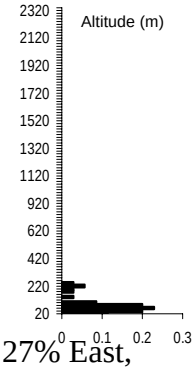


Seedlings (17 records): Absent in 53%: fewer seedlings than prefire adults in 3 cases, and more in 1 case. Seedlings found in Jan (4).
Fire Survival (14 records): 79% escaped fires in fire-safe areas, 21% survived by seedlings only.
Age to first flowering: First flowers recorded at 100% at 1 year, no data for veld older than 2 years.

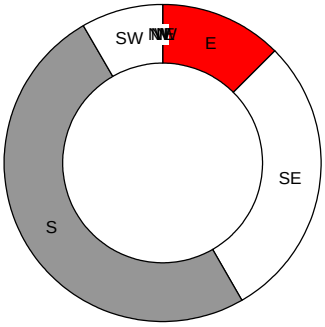


Height (34 records): 12% 0.2-1 m tall, 65% 1-2 m tall, 24% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (35 records): 83% coastal - less than 2 km from coast.
Altitude (35 records): 20 - 240 m; 20 $_{lq}$ - 40 $_{med}$ - 60 $_{uq}$m.



Landform (35 records): 77% riverine, 14% deep soil, 9% shallow soil.
Slope (32 records): 47% gentle incline, 47% valley bottom, 6% steep incline.
Aspect (24 records): 69% South, 27% East, 4% West.



Soil Type (33 records): 52% loamy, 48% sandy.
Soil Colour (33 records): 61% grey, 18% black, 15% white, 6% brown.
Geology (35 records): 100% sandstone.
Vegetation (30 records): 50% grassland, 50% shrubland.

Conservation Status and Threat:
Red Data List Status: Vulnerable B1a(ii)b(ii,iii,iv,v) + 2a(ii)b(ii,iii,iv,v).
Occurrence: 186 km^2 with 24% conserved and 3% lost; Occupancy: 50 km^2 with 45% conserved and 1% lost. Fragmentation index: 27%.
Nature Reserves (35 records): 77% in Nature Reserves - well conserved.
Habitat destruction (25 records): 56% naturally linear habitats, 40% extensive natural habitat, 4% islands.
Alien Invasive Species (28 records): 57% Fabaceae (chiefly alien *Acacia*), 36% none, 4% *Hakea*, 4% Myrtaceae.
Alien Density (28 records): 36% alien-free, 64% sparse.

Cultivation & Utilization:
Picking (23 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Grows in stream beds on sandstone where safe from fire which kills them (ATA92111001-02); Occurs only in stream beds as a fire escape (ATA99011701); Not subjected to fire (BRB99082401); Some plants had scorched leaves but most had escaped the recent fire (BRB99082402); Only on stream margins and on sand banks in stream beds: common on most streams (PAW93012001); Some killed by fire (VCH99082303);
Beetles on the Cones (NGFY1033102);

Confusing Species: None recorded, probably due to its geographical isolation.

Variation and Taxonomy: No significant variation known.

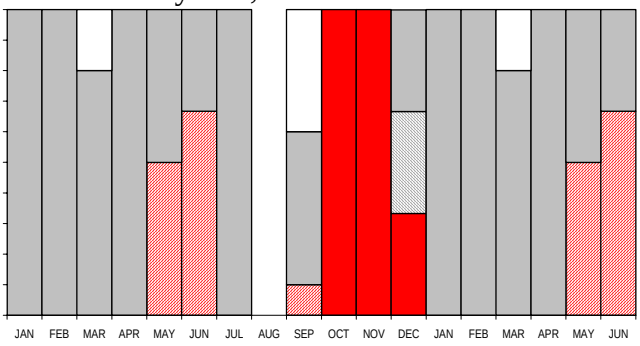
Distribution: Add.
INCLUDEPICTURE
"C:\\temp\\atlas\\LDPOND_m.jpg" *
MERGEFORMAT \d

Leucadendron radiatum Phill. & Hutch. 1912
Langeberg Conebush

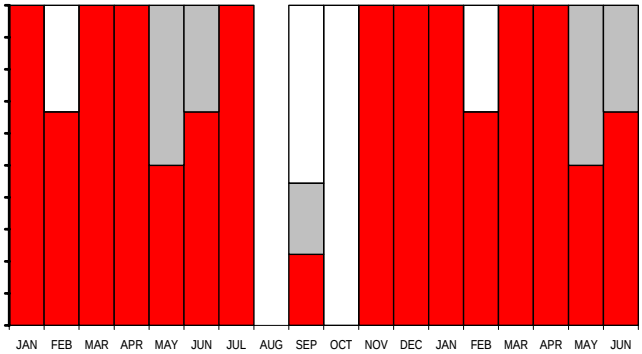
Other Common Names: None known.
Other Scientific Names: None.

38 Records

Population (38 records): 18% Common, 42% Frequent, 37% Rare, 3% Extinct.
Dispersion (32 records): 50% clumped, 34% variable, 13% widespread, 3% evenly distributed.
Flowering (37 records with: Jan 4, Feb 3, Mar 5, Apr 4, May 2, Jun 3, Jul 1, Aug 0, Sep 10, Oct 1, Nov 1, Dec 3): Buds from May to Jun; Flowering from Oct to Dec; Peak Flowering not recorded; Over from Dec; Fruit from Dec to Sep; Nothing from Mar and Sep. Peak levels unreliable at 100% from Oct to Nov. Historically recorded as flowering from late Oct to early Dec, fruit retained.



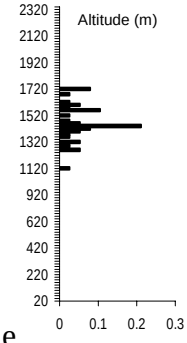
Growth (36 records with: Jan 4, Feb 3, Mar 5, Apr 4, May 2, Jun 3, Jul 1, Aug 0, Sep 9, Oct 1, Nov 1, Dec 3): Much from Nov to Sep; Rare from May to Jun and Sep; None from Feb and Sep to Oct. Peak levels unreliable at 100% from Nov to Jan and Mar to Jul.



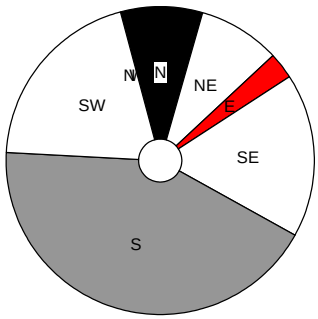
Seedlings (15 records): Absent in 87%: more seedlings than prefire adults in 1 case. Seedlings found in Feb.
Fire Survival : No data.
Age to first flowering: First flowers recorded at 5 years, 50% estimated at 4-5 years, and 100% recorded at 5 years.

Height (37 records): 11% 0-0.2 m tall, 81% 0.2-1 m tall, 8% 1-2 m tall.
Pollinators (2 records): 50% flies, 50% mites.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (38 records): 100% inland - further than 2 km from coast.
Altitude (38 records): 1000 - 1620 m; 1280 *lq* - 1340 *med* - 1340 *uq* m.



Landform (38 records): 47% shallow soil, 45% deep soil, 8% rocky outcrops.
Slope (38 records): 74% steep incline, 13% hill top, 8% gentle incline, 5% cliff.
Aspect (35 records): 59% South, 16% East, 13% North, 13% West.



Soil Type (37 records): 32% sandy, 32% peaty, 22% loamy, 14% rocky.
Soil Colour (37 records): 49% black, 46% grey, 5% brown.
Geology (38 records): 87% sandstone, 13% shale.
Vegetation (38 records): 97% shrubland, 3% grassland.

Conservation Status and Threat:
Red Data List Status: Endangered
B1a(ii)b(i,ii,iii,iv,v) + 2a(ii)b(i,ii,iii,iv,v)
Occurrence (Fynbos): 247 km^2 with 41% conserved and 4% lost; Occupancy: 37 km^2 with 66% conserved and 0% lost. Fragmentation index: 14%.
Nature Reserves (38 records): 92% in Nature Reserves - well conserved.
Habitat destruction (38 records): 89% extensive natural habitat, 8% naturally linear habitats, 3% naturally fragmented habitats.
Alien Invasive Species (34 records): 85% none, 15% *Pinus*.
Alien Density (34 records): 85% alien-free, 15% sparse.

Cultivation & Utilization:

Picking (26 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Female skeleton 3 m across and 3 m high (AGR98092602); About 1.5 m high (WIJ97030909);
No live plants seen. some huge female skeletons with smaller male in gully. reason for lack of recruitment not apparent (AGR98092602); Old dead bushes about 1.5 m high (WIJ97030909);
Confined to unburnt rocky outcrops (SGAY1011002); Growing very close to summit only (WIJ98051607);

Confusing Species: Confused with *L. meridianum*, which is an unrelated limestone species with similarly hairy leaves.

Records of identification queries = 4.
Records of corrected identification queries = 2.

Variation and Taxonomy: Was given a manuscript name Strobilaria radiate by Burchell in 1814, but remained undescribed until 1912.
No variation known.

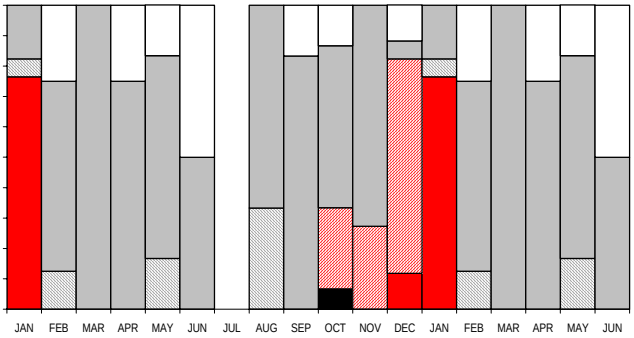
Distribution: Add.
Check is on Kamscheberg and Witelsberg by Muir.
INCLUDEPICTURE "C:\\temp\\atlas\\LDRADI_m.jpg" * MERGEFORMAT \d

Leucadendron rourkei Williams 1972
Uniondale Conebush

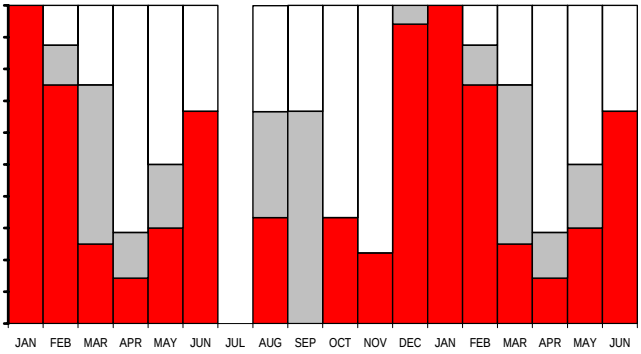
Other Common Names: None known.
Other Scientific Names: None.

109 Records

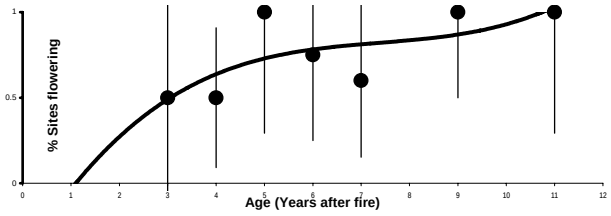
Population (106 records): 5% Abundant, 25% Common, 56% Frequent, 14% Rare.
Dispersion (102 records): 48% clumped, 41% variable, 8% widespread, 3% evenly distributed.
Flowering (103 records with: Jan 17, Feb 8, Mar 4, Apr 8, May 12, Jun 2, Jul 0, Aug 3, Sep 6, Oct 15, Nov 11, Dec 17): Buds from Oct to Dec; Flowering from Jan; Peak Flowering not significant; Over from Aug; Fruit from Feb to Nov; Nothing from Feb, Apr, and Jun. Peak levels at 82% from Dec to Jan. Historically recorded as flowering from Dec to Jan, fruit retained.



Growth (98 records with: Jan 16, Feb 8, Mar 4, Apr 7, May 10, Jun 3, Jul 0, Aug 3, Sep 6, Oct 15, Nov 9, Dec 17): Much from Oct to Mar and May to Aug; Rare from Mar, May and Aug to Sep; None from Mar to Nov. Peak levels at 100 % from Dec to Jan.

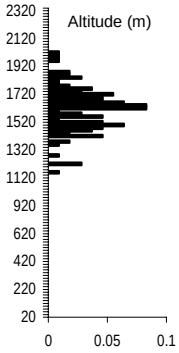


Seedlings (33 records): Absent in 88%: fewer seedlings than prefire adults in 1 case, and more in 1 case. Seedlings found in Oct (2).
Fire Survival (10 records): 50% escaped fires in fire-safe areas, 40% survived by seedlings only, 10% resprouted from aerial trunks.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 4-6 years, and 100% recorded at 9 years.

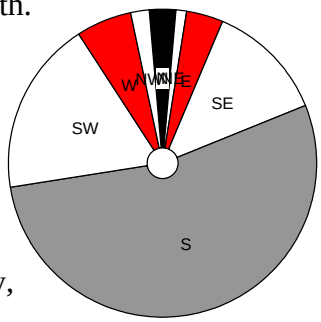


Height (105 records): 20% 0.2-1 m tall, 63% 1-2 m tall, 16% 2-5 m tall.
Pollinators (1 record): 100% flies.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (109 records): 100% inland - further than 2 km from coast.
Altitude (109 records): 1040 - 1920 m; 1380 *lq* - 1520 *med* - 1560 *uq*m.



Landform (106 records): 60% shallow soil, 29% deep soil, 10% rocky outcrops.
Slope (106 records): 71% steep incline, 13% cliff, 13% gentle incline, 3% hill top.
Aspect (104 records): 69% South, 16% West, 10% East, 5% North.



Soil Type (106 records): 43% loamy, 42% sandy, 8% rocky, 5% gravelly, 3% peaty.
Soil Colour (107 records): 52% grey, 25% brown, 19% black, 4% orange.
Geology (104 records): 96% sandstone, 4% shale.
Vegetation (106 records): 97% shrubland, 3% grassland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 1 552 km^2 with 48% conserved and 3% lost; Occupancy: 140 km^2 with 68% conserved and 0% lost. Fragmentation index: 6%.
Nature Reserves (109 records): 60% in Nature Reserves - well conserved.
Habitat destruction (97 records): 97% extensive natural habitat, 3% naturally linear habitats.
Alien Invasive Species (97 records): 94% none, 4% *Pinus*, 2% other aliens.
Alien Density (97 records): 94% alien-free, 6% sparse.

Cultivation & Utilization:
Picking (73 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:

Leaves of young plants with somewhat silvery pubescence and are slightly curved. Herbarium specimens taken (NBG) (NAH95050403);

Confusing Species: Confused with *L. album* (a quite different species in habit and fruit morphology), and both subspecies of *L. uliginosum* (which both have larger leaves, and a longer female perianth).

Records of identification queries = 13.

Records of corrected identification queries = 5.

Variation and Taxonomy: No variation known other than:

- New leaves thinly adpressed pubescent in the Kouga Mountains
- New leaves velvety pubescent elsewhere.

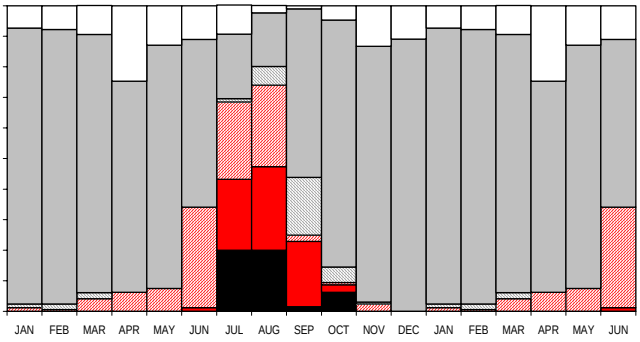
Distribution: Add.

INCLUDEPICTURE "C:\\temp\\atlas\\LDROUR_m.jpg" * MERGEFORMAT \d

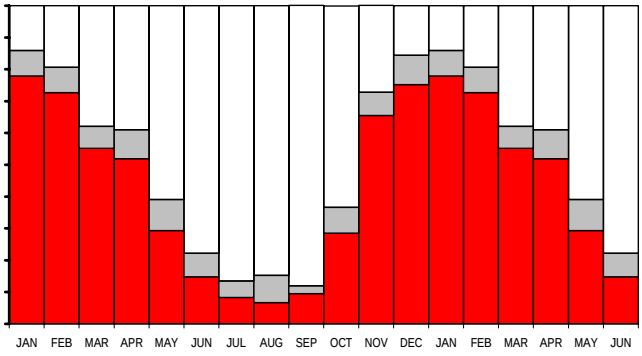
Leucadendron salicifolium (Salisb.) Williams 1807, 1967
Common Stream Conebush
Riviertolbos

Other Common Names: Cuspidate-leaf Eurystermum, Marsh Eurystermum, River Conebush, Strictum, Willow-leaf Conebush, *Geelbos, Knoppiesbos, Knoppiesgeelbos, Knoppiestolbos, Kraaltolbos, Skilpadbos, Wilgerblaartolbos.*
Other Scientific Names: *conifera* Andr 1808, *cuspidifolium* (Salisb. ex Knight) 1809, *strictum* R.Br. 1810, *uliginosum* (Salisb. ex Knight) 1809.

1794 Records
Population (1757 records): 1% Abundant, 41% Common, 50% Frequent, 8% Rare.
Dispersion (1676 records): 61% clumped, 36% variable, 2% widespread.
Flowering (1748 records with: Jan 165, Feb 166, Mar 148, Apr 81, May 93, Jun 82, Jul 95, Aug 165, Sep 201, Oct 276, Nov 166, Dec 110): Buds from Jun to Aug; Flowering from Jul to Sep; Peak Flowering from Jul to Aug; Over not significant; Fruit from Sep to Jul; Nothing from Apr. Peak levels at 80% in Aug. Historically recorded as flowering from early Jul near the coast to Sep at higher altitudes, fruit retained.

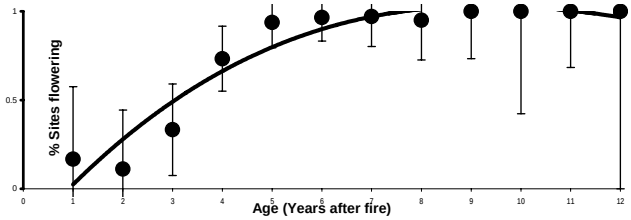


Growth (1728 records with: Jan 163, Feb 165, Mar 145, Apr 77, May 92, Jun 81, Jul 96, Aug 164, Sep 201, Oct 270, Nov 165, Dec 109): Much from Oct to May; Rare not significant; None from Mar to Nov. Peak levels at 86% in Jan.



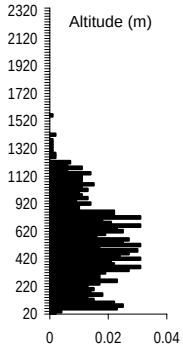
Seedlings (725 records): Absent in 93%: fewer seedlings than prefire adults in 13 cases, and more in 12 cases. Seedlings found in Jan (5), Mar (3), Apr (3), May, Jul, Aug, Sep, Oct (3) and Nov (7).

Fire Survival (52 records): 73% survived by seedlings only, 13% eliminated from the area by fires, 10% escaped fires in fire-safe areas, 4% resprouted from underground boles.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 9 years.

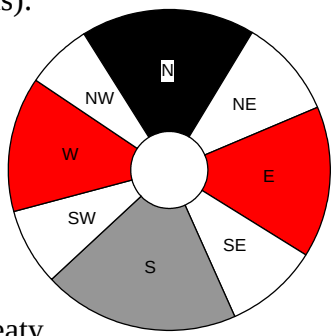


Height (1769 records): 2% 0-0.2 m tall, 10% 0.2-1 m tall, 39% 1-2 m tall, 47% 2-5 m tall, 2% taller than 5 m.
Pollinators (21 records): 43% wind, 29% beetles, 19% bees or wasps, 10% flies.
Detailed Pollinators (2 records): Monkey Beetle, Honey Bee.

Habitat:
Distance to Ocean (1737 records): 97% inland - further than 2 km from coast.
Altitude (1737 records): 20 - 1460 m; 300 *lq* - 500 *med* - 700 *uq* m.



Landform (1725 records): 71% deep soil, 13% shallow soil, 10% riverine, 5% rocky outcrops, 2% swamp.
Slope (1716 records): 51% gentle incline, 27% steep incline, 13% valley bottom, 8% platform.
Aspect (1520 records): 28% South, 26% North, 25% East, 21% West.



Soil Type (1652 records): 52% sandy, 27% loamy, 9% gravelly, 6% rocky, 4% clayey, 3% peaty.
Soil Colour (1639 records): 45% grey, 32% brown, 9% white, 7% black, 4% orange, 3% yellow.
Geology (1638 records): 78% sandstone, 13% shale, 6% granite, 1% silcrete or ferricrete, 1% Tertiary sands.
Vegetation (1721 records): 93% shrubland, 3% plantations, 2% thicket.

Conservation Status and Threat:
Red Data List Status: Least Concern.

Occurrence (Fynbos): 13 533 km^2 with 21% conserved and 20% lost; Occupancy: 1 801 km^2 with 40% conserved and 15% lost. Fragmentation index: 6%.
Nature Reserves (1737 records): 50% in Nature Reserves - well conserved.
Habitat destruction (1699 records): 82% extensive natural habitat, 10% naturally linear habitats, 5% islands, 2% road verges.
Alien Invasive Species (1676 records): 37% none, 28% *Pinus*, 20% Fabaceae (chiefly alien *Acacia*), 13% *Hakea*, 2% Myrtaceae.
Alien Density (1676 records): 37% alien-free, 47% sparse, 12% abundant, 3% dense.

Cultivation & Utilization:
Picking (1269 records): 99% no sign of picking, 0.6% lightly picked, 0.3% severely picked.
Cultivation Status: Plantings - 17 records (1%), Escapes - 1 record.

Atlassers Notes:
Records of occurring or confined to streams, seeps and river banks omitted.
2 m tall: usually 4-5 m in river beds (VJK93053002); Tallest plants that I've ever seen (but all killed by fire) (WEL96012705);
Males only flowering (AGRY3103119+21);
Ants Were Farming Leafhoppers Half Way Up Stem (AGR91111602); Look as if some animal has eaten most of leaves and fine branches hence most new growth (VJK97030203);
Shows some die back (SMR97031908); Crowded out by pines and very unhappy (SMR98032505); Also plants dying (VCH99040402); Very dry – plants dying (VCH99040403);
Hacked (APE92071610);
Planted in road verge! (APE94082201); Alongside road (planted?) (AWA95092102); This confirms that this is planted and not a range extension (DOA99112301); Probably planted at roadside (WIJ94010201);
Introduced 10 years ago (MJDY0100801);

Confusing Species: Confused principally (60% of cases) with *L. xanthoconus*, which in areas where *L. salicifolium* is absent, occupies river courses and grows much larger than plants adjacent the wet areas: it has however silvery-haired mature leaves and the male flowerheads are similar to female flowerheads in size, and bilobed cone bracts. Also mistaken for *L. coniferum* (with much broader fruit, and similar sized male and female flowerheads), *conicum* (a close relative and quite similar in habit and habitat, but which has shorter leaves and pubescent basal bracts), *microcephalum* (with broad leaves quite a different beast) and *spissifolium* (probably a typographical error, as this is a low resprouter with broad leaves).
Records of identification queries = 57.
Records of corrected identification queries = 30.

Variation and Taxonomy: No variation known.

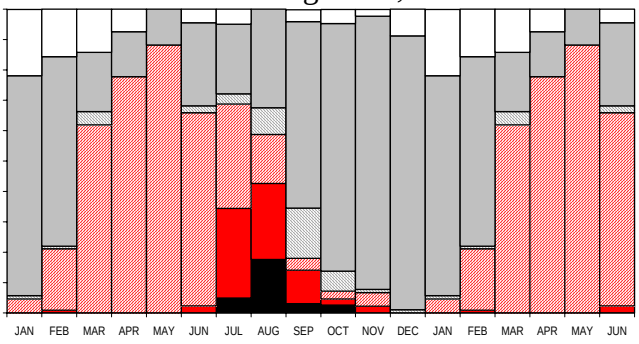
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSFLM_m.jpg" * MERGEFORMAT \d

Leucadendron microcephalum (Gand.) Gand. & Schinz. 1901, 1913
Oil-bract Conebush

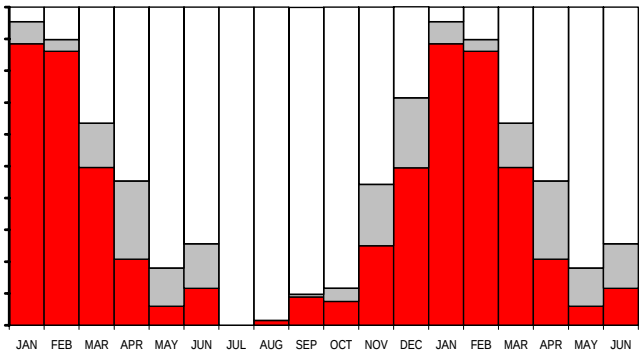
Other Common Names: Bootpolish Conebush, Scallop-nest Conebush, *Geelbos.*
Other Scientific Names: *decorum* form *microcephalum* Gand 1901, *squarrosum* R.Br. 1810, *stokoei* Phill 1921.

1066 Records

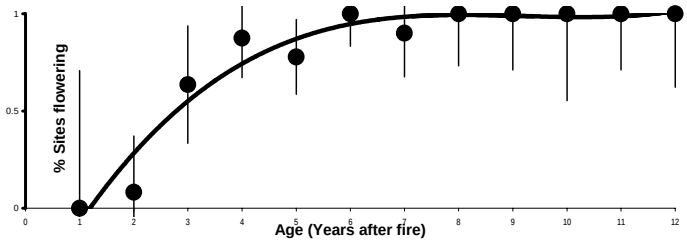
Population (1053 records): 2% Abundant, 41% Common, 45% Frequent, 12% Rare.
Dispersion (969 records): 67% variable, 28% clumped, 5% widespread.
Flowering (1045 records with: Jan 87, Feb 109, Mar 113, Apr 54, May 51, Jun 44, Jul 61, Aug 68, Sep 127, Oct 151, Nov 89, Dec 91): Buds from Feb to Jul; Flowering from Jul to Aug; Peak Flowering from Aug; Over from Sep; Fruit from Jun to Feb; Nothing from Jan. Peak levels at 72% in Jul. Historically recorded as flowering in Jul, fruit retained.



Growth (1034 records with: Jan 87, Feb 108, Mar 115, Apr 53, May 50, Jun 43, Jul 61, Aug 68, Sep 123, Oct 147, Nov 88, Dec 91): Much from Nov to Apr; Rare from Apr and Dec; None from Mar to Dec. Peak levels at 95% in Jan.

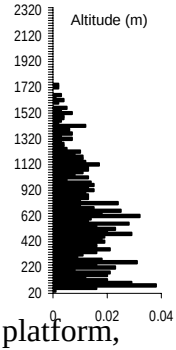


Seedlings (455 records): Absent in 93%: fewer seedlings than prefire adults in 7 cases, and more in 8 cases. Seedlings found in Jan (2), Mar, Apr, Jun (3), Sep (3), Dec (5).
Fire Survival (32 records): 91% survived by seedlings only, 6% eliminated from the area by fires, 3% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% recorded at 6 years.

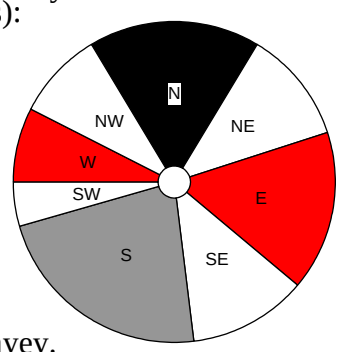


Height (1047 records): 2% 0-0.2 m tall, 51% 0.2-1 m tall, 45% 1-2 m tall, 2% 2-5 m tall.
Pollinators (5 records): 80% beetles, 20% bees or wasps.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (1033 records): 95% inland - further than 2 km from coast.
Altitude (1033 records): 20 - 1640 m; 260 $_{lq}$ - 540 $_{med}$ - 820 $_{uq}$m.



Landform (1027 records): 73% deep soil, 23% shallow soil, 3% rocky outcrops.
Slope (1028 records): 51% gentle incline, 41% steep incline, 3% platform, 3% hill top, 1% valley bottom.
Aspect (963 records): 32% South, 28% North, 28% East, 13% West.



Soil Type (1026 records): 58% sandy, 20% loamy, 9% gravelly, 6% rocky, 3% peaty, 3% clayey.
Soil Colour (1021 records): 68% grey, 18% brown, 7% black, 5% white, 1% orange.
Geology (1012 records): 88% sandstone, 11% shale.
Vegetation (1027 records): 98% shrubland, 1% plantations.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 3 234 km^2 with 37% conserved and 20% lost; Occupancy: 736 km^2 with 53% conserved and 9% lost. Fragmentation index: 15%.
Nature Reserves (1033 records): 59% in Nature Reserves - well conserved.
Habitat destruction (1023 records): 97% extensive natural habitat, 1% islands.
Alien Invasive Species (1019 records): 49% *Pinus*, 34% none, 11% *Hakea*, 5% Fabaceae (chiefly alien *Acacia*).

Alien Density (1018 records): 34% alien-free, 53% sparse, 9% abundant, 3% dense.

Cultivation & Utilization:
Picking (707 records): 99% no sign of picking, 0.7% lightly picked.
Cultivation Status: Plantings - 3 records, Augmentations - 1 record, Escapes - 4 records.

Atlassers Notes:
Beautiful silvery hairy leaf form with salmon pink colouring to leaves beneath hairs (AGRY1032423); Silver-leaved (SHRY1032407);
Bad baboon damage for perch (AGR93081201); No cones in patch with female adults apparently removed by baboons (APE93021406);
Only 1 male seen (AGR91122604, AGR92110102); All female and all by the stream (HCE96070906); Male (WMPY0121706);
And 2 dead (AGRY0121712); Only 1 and it was dead (SMRY0041206);
Beetles eating inflorescence (APE92080906); Pollinator: Grey/beige long-snout weevil (AWA95091903);

Confusing Species: Commonly confused with *L. gandogeri* (which also has a brown "boot polish" on the cones and buds) and *L. laureolum* (which has the young female cones ridged and hidden in the involucral leaves), but is unique with the large, scallop-shaped brown involucral bracts (which may become difficult to see in mature female cones, but are always obvious on male flowerheads – even if these need to be looked for on the ground) and the asymmetrical fruit.
Records of identification queries = 47.
Records of corrected identification queries = 13.

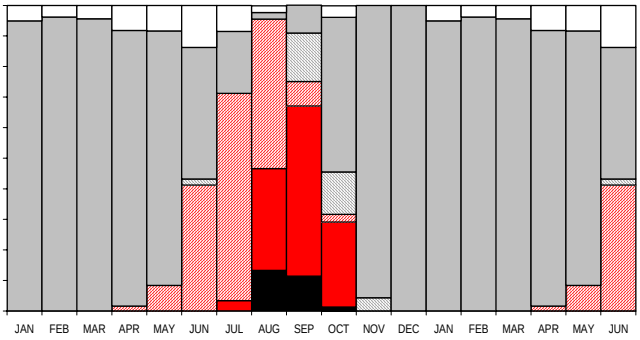
Variation and Taxonomy: No variation noted in the literature, but Silver forms occur at <lookup>.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDMICR_m.jpg" * MERGEFORMAT \d

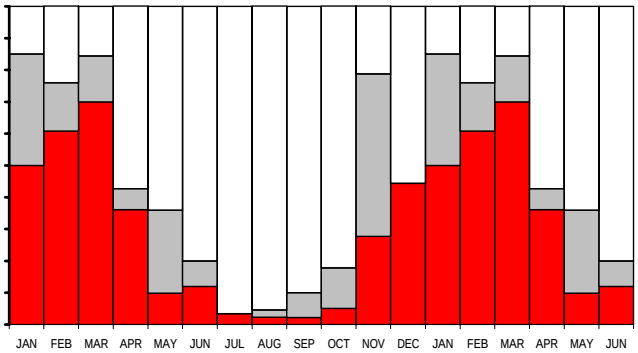
Leucadendron lanigerum var. *lanigerum* Buek ex Meisn. 1856
Common Shale Conebush
Grofblaartolbos

Other Common Names: Rough-leaf Conebush, Squarrose Protea. *Rooikoptolbos, Jubilee Crown.*
Other Scientific Names: *rubricallosum* Buek ex Drege 1844, *squarrosa* Salisb. ex Knight 1809.

765 Records
Population (758 records): 25% Common, 56% Frequent, 19% Rare.
Dispersion (711 records): 79% variable, 20% clumped.
Flowering (759 records with: Jan 20, Feb 79, Mar 90, Apr 61, May 131, Jun 51, Jul 59, Aug 45, Sep 88, Oct 79, Nov 47, Dec 9): Buds from Jun to Aug; Flowering from Aug to Oct; Peak Flowering and Over not significant; Fruit from Oct to Jul; Nothing not significant. Peak levels at 96% in Aug. Historically recorded as flowering from Aug, fruit retained.



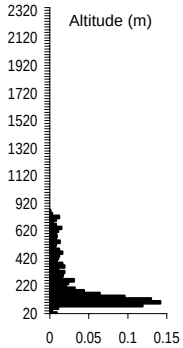
Growth (759 records with: Jan 20, Feb 79, Mar 90, Apr 61, May 131, Jun 50, Jul 59, Aug 44, Sep 90, Oct 79, Nov 47, Dec 9): Much from Nov to Apr; Rare from Jan, May and Nov; None from Feb, Apr to Dec. Peak levels at 85% in Jan.



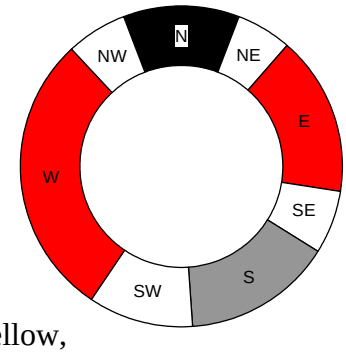
Seedlings (299 records): Absent in 99%: more seedlings than prefire adults in 1 case. Seedlings found in Oct.
Fire Survival (49 records): 98% resprouted from underground boles, 2% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 2 years, and 100% recorded at 4 years.

Height (760 records): 82% 0.2-1 m tall, 18% 1-2 m tall.
Pollinators (18 records): 83% beetles, 11% flies, 6% bees or wasps.
Detailed Pollinators (8 records): Monkey Beetle (7), Longhorn Beetle.

Habitat:
Distance to Ocean (747 records): 99% inland - further than 2 km from coast.
Altitude (747 records): 20 - 760 m; 80 *lq* - 120 *med* - 140 *uq* m.



Landform (746 records): 96% deep soil, 3% shallow soil.
Slope (743 records): 45% gentle incline, 38% platform, 9% steep incline, 4% hill top, 3% valley bottom.
Aspect (544 records): 37% West, 23% South, 22% East, 17% North.



Soil Type (741 records): 40% loamy, 40% sandy, 14% clayey, 5% gravelly.
Soil Colour (739 records): 59% brown, 18% grey, 10% orange, 7% white, 4% yellow, 2% red.
Geology (708 records): 32% shale, 30% granite, 20% Tertiary sands, 11% sandstone, 3% silcrete or ferricrete, 3% conglomerate.
Vegetation (744 records): 98% shrubland, 1% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Endangered A2c.
Occurrence (Fynbos (Total)): 2 789 (7 174) km^2 with 20 (8)% conserved and 44 (69)% lost; Occupancy: 644 km^2 with 11% conserved and 54% lost. Fragmentation index: 9%.
Nature Reserves (747 records): 30% in Nature Reserves.
Habitat destruction (737 records): 68% extensive natural habitat, 23% islands, 4% road verges, 2% corridors, 2% naturally

linear habitats, 2% naturally fragmented habitats.
Alien Invasive Species (735 records): 55% Fabaceae (chiefly alien *Acacia*), 29% none, 11% *Pinus*, 3% Myrtaceae, 2% *Hakea*.
Alien Density (735 records): 29% alien-free, 42% sparse, 18% abundant, 9% dense, 2% impenetrable.

Cultivation & Utilization:
Picking (610 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Some plants with red flowers! (AGR96080907);
Females leaves to 31 mm long (WIJ94061803); Leaves male 12-17 mm long, female 22-25 mm long (WIJ94061804);
This population of *L. salignum* has slightly hard edges to the leaves and very slightly scabrous and also has dimpled cones: strong affinity to *L. lanigerum*: definitely two morphs present so atlassed as LD LANI N for records! (AGR97042802); Both smooth and rough leaves; some single stemmed - collection made for NBG (NAHY1080901);
One clump of very tall (over 3 m) plants, but mostly less than 1 m (SMR97052806); Plants here over 1 m tall, on better side plants less than 1 m tall (WMPY1091401); A very low growing form - many less than 200 mm tall - with attractive inflorescence (SMR99072108);
Males in bud; females mostly with cones but no apparent buds at tips of last years growth (SMR99082601);
2/3 of plants killed by fire! (AGRY1101807); 3 out of 5 killed in fire (GYC95100402); A number of plants were killed by the fire and thus never resprouted (NGFY1011301); Some plants were on single stems (WIJ94031201); Some resprouters and a few non–resprouters (WIJ94031202);
All males (AGR96021401); Mainly males - some dead females seen. Veld moribund. Sampling lesson: only saw 3 of the plants on third walk along same path! (AGR99100705); All males - moribund (AGR99100706); All male in this plot (JID98052001); 10% of plants senescent; (NAHY1080901); 1 female and about 12 males (SMRY3022601);
Heavily grazed probably by cows (NGF96051601); Parent plant had been chopped (SMRY0072710);

Confusing Species: Odd coding errors and atlassers reluctant to use subspecies. Probably confused with *L. salignum,* especially the forms with reduced involucral leaves, but this error would be very difficult to detect: even though it was searched for , no obvious instances were detected.
Records of identification queries = 17.
Records of corrected identification queries = 4.

Variation and Taxonomy: Varies in height, size of leaves and size of floral parts, but this “does not appear to be of any significance” (Williams 1972). Atlassers picked up some of this variation, but no geographical patterns were detected.
The variety *laevigatum* should be a subspecies as it is geographically isolated and quite distinct.

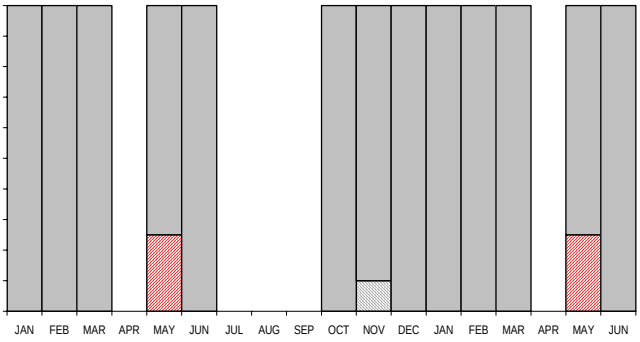
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDLANIN_m.jpg" * MERGEFORMAT \d

Leucadendron lanigerum var. *laevigatum* Meisn. 1856
Worcester Shale Conebush

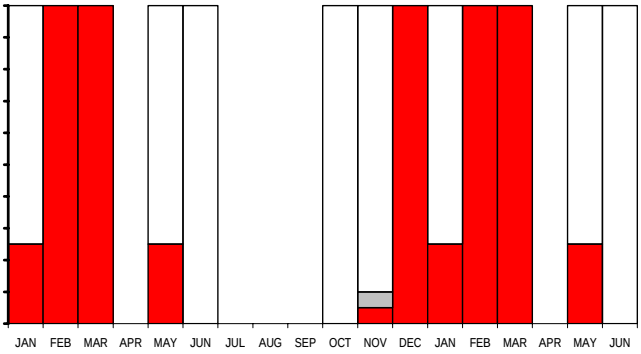
Other Common Names: None known.
Other Scientific Names: *aemulum* Schltr 1900, *heterophyllum* E.Mey. ex Drege 1844.

36 Records

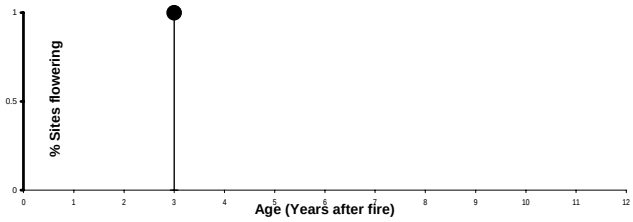
Population (35 records): 14% Common, 69% Frequent, 14% Rare, 3% Extinct.
Dispersion (33 records): 61% variable, 36% clumped, 3% widespread.
Flowering (34 records with: Jan 4, Feb 2, Mar 1, Apr 0, May 4, Jun 1, Jul 0, Aug 0, Sep 0, Oct 1, Nov 20, Dec 1): Buds from May; Flowering and Peak Flowering not recorded; Over not significant from Nov; Fruit from all year round; Nothing not recorded. Peak levels unreliable. Historically recorded as flowering from late Jul to late Sep, fruit retained.



Growth (33 records with: Jan 4, Feb 1, Mar 1, Apr 0, May 4, Jun 1, Jul 0, Aug 0, Sep 0, Oct 1, Nov 20, Dec 1): Much from Dec to May; Rare not significant; None from Jan and May to Nov. Peak levels unreliable at 100% from Feb to Mar and Dec.

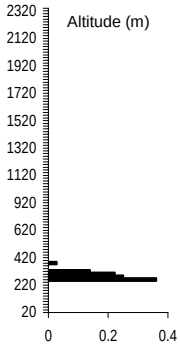


Seedlings (14 records): Absent in 86%: fewer seedlings than prefire adults in 1 case. Seedlings found in Oct.
Fire Survival (2 records): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 100% at 3 years.

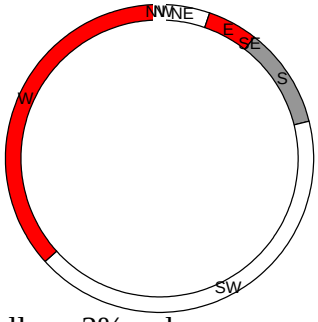


Height (33 records): 58% 0.2-1 m tall, 42% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (36 records): 100% inland - further than 2 km from coast.
Altitude (36 records): 240 - 380 m; 240 $_{lq}$ - 260 $_{med}$ - 260 $_{uq}$m.



Landform (36 records): 97% deep soil, 3% swamp.
Slope (36 records): 53% platform, 33% gentle incline, 8% valley bottom, 6% hill top.
Aspect (19 records): 66% West, 24% South, 11% East.



Soil Type (34 records): 38% sandy, 38% loamy, 18% clayey, 6% gravelly.
Soil Colour (32 records): 59% brown, 16% grey, 16% orange, 6% yellow, 3% red.
Geology (27 records): 44% shale, 19% sandstone, 19% silcrete or ferricrete, 19% Tertiary sands.
Vegetation (36 records): 92% shrubland, 6% agricultural lands, 3% grassland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A2c, B1b(i,ii,iii,iv,v)c(iv),
Occurrence (Fynbos): 33 km^2 with 0% conserved and 68% lost; Occupancy: 32 km^2 with 0% conserved and 66% lost. Fragmentation index: 89%.
Nature Reserves (36 records): 8% in Nature Reserves - inadequately conserved.
Habitat destruction (36 records): 44% islands, 44% extensive natural habitat, 8% naturally linear habitats, 3% corridors.
Alien Invasive Species (36 records): 53% Fabaceae (chiefly alien *Acacia*), 31% *Pinus*, 14% *Hakea*, 3% Myrtaceae.
Alien Density (36 records): 61% sparse, 33% abundant, 6% dense.

Cultivation & Utilization:
Picking (22 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Interfire recruitment in quarry (DJL98100907);
Revisited site as had seen two plants here a few years back: area badly overgrazed - no sign of any plants now (AGRY2061301); Was once (last year!) one of the biggest populations of this species - now confined to around the quarry due to recent ploughing up of this site (DJL98100907);

Confusing Species: All incorrect records were misidentified or miscoded as the type subspecies, which is a resprouter with shorter, rougher and hairier leaves.

Records of identification queries = 6.
Records of corrected identification queries = 4.

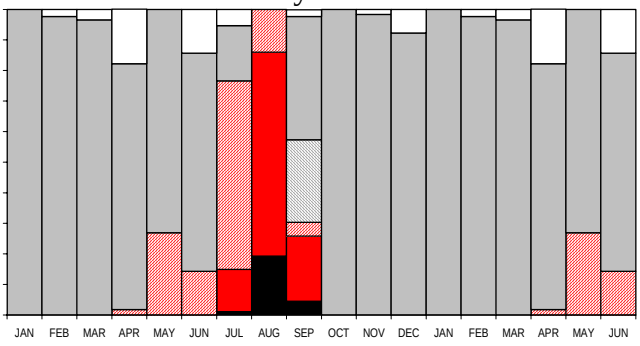
Variation and Taxonomy: No variation noted.
The variety *laevigatum* should be a subspecies as it is geographically isolated and quite distinct.

Distribution: Add.
Williams notes that Drege's (1844) locality Hexriversberg 3500-4000ft is clearly an error.
INCLUDEPICTURE
"C:\\temp\\atlas\\LDLANIV_m.jpg" *
MERGEFORMAT \d

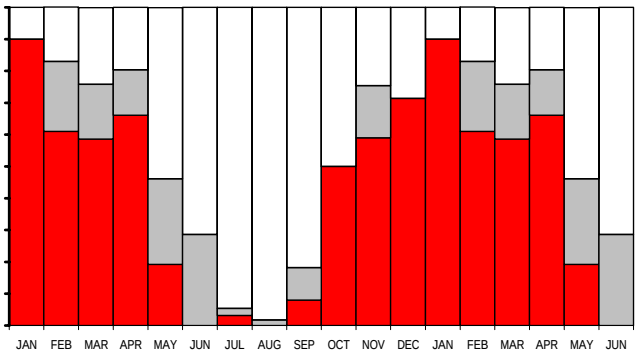
Leucadendron modestum Williams 1967
Rough-leaf Conebush
Skugtertolbos

Other Common Names: Modest-cone Conebush, Strawberries, *Skilpadbossie.*
Other Scientific Names: None.

655 Records
Population (645 records): 4% Abundant, 45% Common, 42% Frequent, 9% Rare.
Dispersion (469 records): 81% variable, 16% clumped, 2% widespread.
Flowering (496 records with: Jan 10, Feb 43, Mar 29, Apr 56, May 26, Jun 7, Jul 94, Aug 57, Sep 89, Oct 11, Nov 61, Dec 13): Buds from May and Jul; Flowering from Aug to Sep; Peak Flowering from Aug; Over from Sep; Fruit from Sep to Jun; Nothing from Apr. Peak levels at 100% in Aug. Historically recorded as flowering from Aug, fruits retained for a year or two.



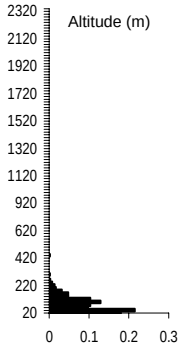
Growth (492 records with: Jan 10, Feb 41, Mar 29, Apr 56, May 26, Jun 7, Jul 93, Aug 57, Sep 88, Oct 10, Nov 61, Dec 14): Much from Oct to Apr; Rare from Feb and May to Jun; None from Mar to Dec. Peak levels at 90% in Jan.



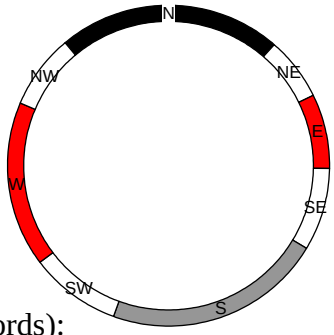
Seedlings (164 records): Absent in 91%: fewer seedlings than prefire adults in 4 cases, and more in 3 cases. Seedlings found in Jan, Jul (4), Aug and Oct.
Fire Survival (29 records): 86% survived by seedlings only, 14% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% recorded at 5 years.

Height (495 records): 2% 0-0.2 m tall, 89% 0.2-1 m tall, 8% 1-2 m tall.
Pollinators (7 records): 86% beetles, 14% flies.
Detailed Pollinators (6 records): Monkey Beetle (5), Hover Fly.

Habitat:
Distance to Ocean (651 records): 100% inland - further than 2 km from coast.
Altitude (651 records): 20 - 440 m; 20 *lq* - 40 *med* - 40 *uq* m.



Landform (498 records): 94% deep soil, 4% shallow soil, 2% swamp.
Slope (498 records): 43% gentle incline, 42% platform, 8% valley bottom, 4% hill top, 2% steep incline, 1% dunes.
Aspect (299 records): 30% South, 29% North, 25% West, 15% East.



Soil Type (490 records): 36% sandy, 35% loamy, 20% clayey, 9% gravelly.
Soil Colour (484 records): 54% brown, 31% grey, 8% orange, 4% white, 2% yellow.
Geology (594 records): 44% shale, 30% silcrete or ferricrete, 16% sandstone, 5% limestone, 3% Tertiary sands.
Vegetation (650 records): 99% shrubland, 1% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Endangered A2c.
Occurrence (Fynbos): 2 447 km^2 with 14% conserved and 33% lost; Occupancy: 619 km^2 with 9% conserved and 59% lost. Fragmentation index: 16%.
Nature Reserves (651 records): 9% in Nature Reserves - inadequately conserved.
Habitat destruction (497 records): 60% extensive natural habitat, 22% islands, 14% road verges, 2% naturally fragmented habitats, 1% naturally linear habitats.

Alien Invasive Species (491 records): 73% Fabaceae (chiefly alien *Acacia*), 11% none, 8% Myrtaceae, 8% *Pinus*.
Alien Density (491 records): 11% alien-free, 51% sparse, 27% abundant, 9% dense, 2% impenetrable.

Cultivation & Utilization:
Picking (383 records): 100% no sign of picking, 0.3% severely picked.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Odd very tall plants similar to *L. stelligerum* (AGR95042912+13, AGR95043004); *L. stelligerum* and *modestum* on same plot - appears to be intermediate population (AGR97113002); Very tall with rather large leaves (AGR99052005); A very robust and broad leaved form to 1 m tall (AGRY1031429); Could be *L. stelligerum* or *modestum* - should be investigated further (AMMY1030116); Both *L. stelligerum* and *modestum* appear to be present (COH97081702, DEB99010112); Some odd much taller plants approaching *L. stelligerum* seen - but these are scattered and isolated and clearly sports (or hybrids) of *L. modestum* (LYM96072706, NGF96072705); Approaching mixed stands of *L. stelligerum* and *modestum* (LYM97113002); *L. stelligerum* and *modestum* both on same SRS - most individuals large and *stelligerum*-like in appearance - only a few ' stunted' ones indistinguishable from *modestum* in a clump (LYM97113003); *L. stelligerum* and *modestum* on same locality - about equal in abundance, *modestum* more widespread (NGF97113002);
Male (SGAY1031418);
Found only on road verge (LYM95092404);
Growing on fallow agricultural land (LYM98091103); Growing in ploughed field (LYM98091107);

Confusing Species: Only confused with *L. stelligerum*, confounded by odd taller, larger-leaved plants popping up as sports within typical *L. modestum* populations, but scattered and seldom common.
Records of identification queries = 28.
Records of corrected identification queries = 11.

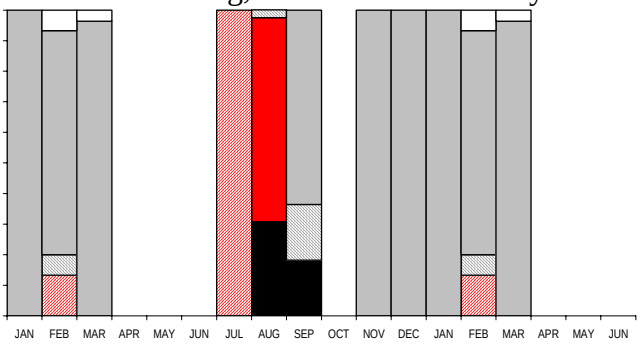
Variation and Taxonomy: Although noted by Williams as not varying significantly, atlassers did note some variation. Populations in the extreme southeast of the Agulhas Plain approached *L. stelligerum* in size. In addition, taller, more robust plants appear sporadically within typical *L. modestum* populations: these may be sports or they might possibly be hybrids resulting from freak long distance pollination events: all such recorded sports are within 15 km of typical *L. stelligerum* populations.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDMODE_m.jpg" * MERGEFORMAT \d

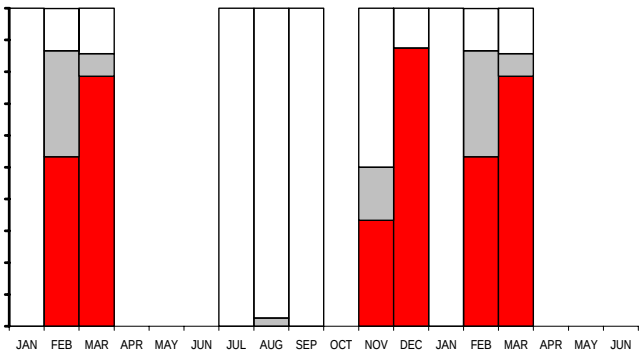
Leucadendron stelligerum Williams 1967
Agulhas Conebush
Sterretjies

Other Common Names: None known.
Other Scientific Names: None.

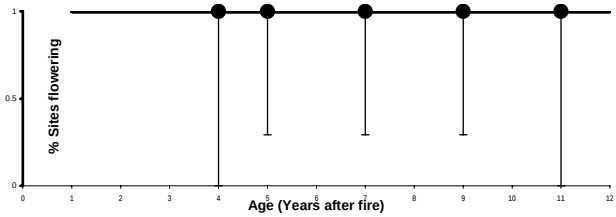
136 Records
Population (135 records): 3% Abundant, 47% Common, 42% Frequent, 7% Rare.
Dispersion (112 records): 84% variable, 15% clumped, 0.9% evenly distributed.
Flowering (117 records with: Jan 2, Feb 15, Mar 28, Apr 0, May 0, Jun 0, Jul 9, Aug 39, Sep 11, Oct 0, Nov 6, Dec 7): Buds from Jul; Flowering from Aug; Peak Flowering from Aug; Over from Sep; Fruit from Sep to Mar; Nothing not significant. Peak levels at 100% in Aug. Historically recorded as flowering from Jul to Aug, fruit retained for 1-2 years.



Growth (118 records with: Jan 2, Feb 15, Mar 28, Apr 0, May 0, Jun 0, Jul 9, Aug 39, Sep 11, Oct 0, Nov 6, Dec 8): Much from Nov to Mar; Rare from Feb; None from Jan and Jul to Nov. Peak levels unreliable at 88% in Dec.

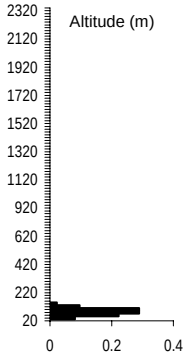


Seedlings (32 records): All without any seedlings present.
Fire Survival (1 record): 100% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 4 years, 50% estimated at 2-3 years, and 100% recorded at 4 years.

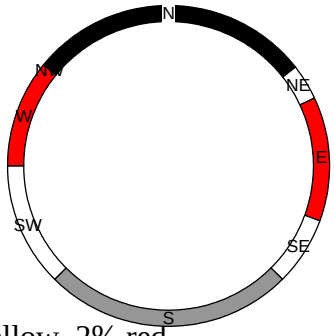


Height (118 records): 85% 0.2-1 m tall, 15% 1-2 m tall.
Pollinators (7 records): 57% flies, 43% beetles.
Detailed Pollinators (1 record): Monkey Beetle.

Habitat:
Distance to Ocean (135 records): 100% inland - further than 2 km from coast.
Altitude (135 records): 20 - 140 m; 40 $_{lq}$ - 60 $_{med}$ - 80 $_{uq}$m.



Landform (117 records): 92% deep soil, 6% shallow soil, 1% riverine, 1% swamp.
Slope (115 records): 50% platform, 36% gentle incline, 9% hill top, 6% valley bottom.
Aspect (56 records): 34% South, 30% North, 18% East, 18% West.



Soil Type (114 records): 44% clayey, 31% loamy, 14% sandy, 11% gravelly.
Soil Colour (116 records): 53% brown, 28% grey, 15% orange, 2% white, 2% yellow, 2% red.
Geology (118 records): 59% silcrete or ferricrete, 31% shale, 7% sandstone, 3% Tertiary sands.
Vegetation (134 records): 95% shrubland, 4% agricultural lands, 1% plantations.

Conservation Status and Threat:
Red Data List Status: Critically Endangered A4c.
Occurrence (Fynbos): 122 km^2 with 18% conserved and 49% lost; Occupancy: 82 km^2 with 22% conserved and 58% lost. Fragmentation index: 64%.
Nature Reserves (135 records): 13% in Nature Reserves - inadequately conserved.
Habitat destruction (119 records): 45% extensive natural habitat, 33% road verges, 19% islands, 2% naturally fragmented habitats.

Alien Invasive Species (116 records):
66% Fabaceae (chiefly alien *Acacia*), 21% none, 9% *Pinus*, 4% Myrtaceae.
Alien Density (116 records): 21% alien-free, 65% sparse, 13% abundant, 2% dense.

Cultivation & Utilization:
Picking (92 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
L. stelligerum and *modestum* on same plot - appears to be intermediate population (AGR97113002); Both *L. stelligerum* and *modestum* appear to be present (COH97081702); *L. stelligerum* and *modestum* both on same srs- most individuals large and *stelligerum*–like in appearance - only a few ' stunted' ones indistinguishable from *modestum* (LYM97113003); *L. stelligerum* and *modestum* on same locality - about equal in abundance but *stelligerum* all in a clump (NGF97113002);

Confusing Species: Confused with *L. modestum*, which is a much smaller shrub, with smaller leaves and inconspicuous involucral leaves.
Records of identification queries = 18.
Records of corrected identification queries = 11.

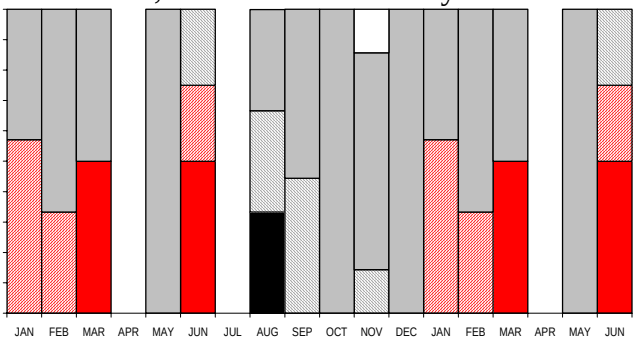
Variation and Taxonomy: No variation known.
Early collections in the 1900s were identified as *L. minus* var. *glabescens* (now *L. spissifolium*).
Taller, more robust plants closely resembling *L. stelligerum* appear sporadically within typical *L. modestum* populations up to about 15 km away from the range of *L. stelligerum*: might these possibly be hybrids resulting from freak long distance pollination events.. Populations in the extreme southeast of the Agulhas Plain <locality> should be critically evaluated to ascertain if they might not be an outlier of this species.
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSGRM_m.jpg" * MERGEFORMAT \d

Leucadendron diemontianum Williams 1972
Visgat Conebush

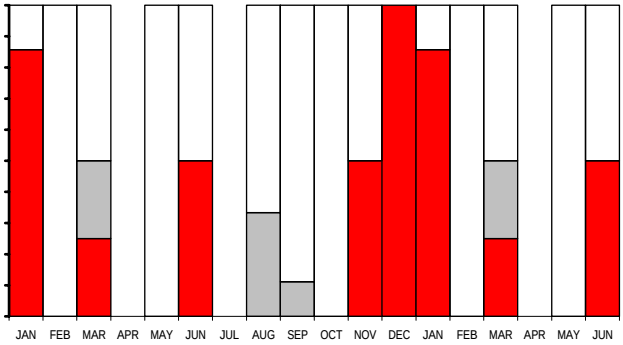
Other Common Names: None known.
Other Scientific Names: None.

56 Records

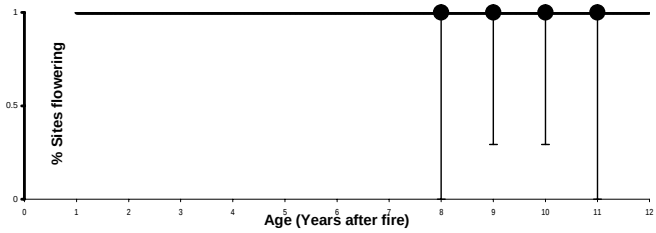
Population (53 records): 25% Common, 60% Frequent, 15% Rare.
Dispersion (50 records): 58% clumped, 38% variable, 2% evenly distributed, 2% widespread.
Flowering (55 records with: Jan 7, Feb 3, Mar 4, Apr 0, May 4, Jun 4, Jul 0, Aug 3, Sep 9, Oct 2, Nov 14, Dec 5): Buds from Jan to Feb and Jun; Flowering from Mar and Jun; Peak Flowering from Aug; Over from Jun to Sep; Fruit from Aug to May; Nothing not significant. Peak levels unreliable at 100% in Jun. Historically recorded as flowering from Jun, fruit retained for 2-3 years.



Growth (55 records with: Jan 7, Feb 3, Mar 4, Apr 0, May 4, Jun 4, Jul 0, Aug 3, Sep 9, Oct 2, Nov 14, Dec 5): Much from Nov to Jan, Mar and Jun; Rare from Mar and Aug; None from Feb to Nov. Peak levels unreliable at 100% in Dec.

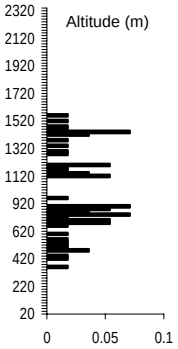


Seedlings (35 records): Absent in 94%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jun.
Fire Survival (7 records): 71% survived by seedlings only, 29% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% estimated at 2-6 years.

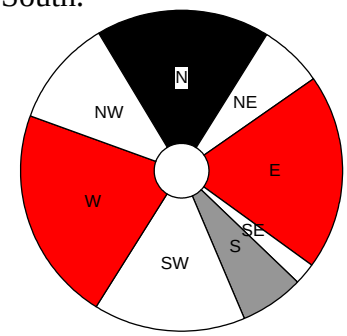


Height (56 records): 36% 0.2-1 m tall, 54% 1-2 m tall, 11% 2-5 m tall.
Pollinators (1 record): 100% none observed.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (53 records): 100% inland - further than 2 km from coast.
Altitude (53 records): 340 - 1460 m; 660 *lq* - 780 *med* - 1040 *uq*m.



Landform (53 records): 57% deep soil, 28% shallow soil, 11% rocky outcrops, 2% riverine, 2% swamp.
Slope (51 records): 65% gentle incline, 22% steep incline, 8% valley bottom, 6% platform.
Aspect (44 records): 34% West, 28% North, 25% East, 13% South.



Soil Type (52 records): 54% sandy, 23% loamy, 13% gravelly, 10% rocky.
Soil Colour (51 records): 49% grey, 31% brown, 12% white, 8% yellow.
Geology (51 records): 94% sandstone, 6% shale.
Vegetation (53 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 1 705 km^2 with 26% conserved and 11% lost; Occupancy: 89 km^2 with 25% conserved and 3% lost. Fragmentation index: 5%.
Nature Reserves (53 records): 30% in Nature Reserves.
Habitat destruction (53 records): 98% extensive natural habitat, 2% naturally linear habitats.
Alien Invasive Species (50 records): 70% none, 20% *Pinus*, 10% Fabaceae (chiefly alien *Acacia*).
Alien Density (50 records): 70% alien-free, 26% sparse, 4% abundant.

Cultivation & Utilization:
Picking (48 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
About 30 plants (AGR96052602); About 20 seen (AGRY0081224); 100 plants live (AGRY1022103); About 30 plants (NAH92060603); 2 small populations in this valley one with about 15 plants the other with 10 plants (NAH92091202);
Mixed ages - lots of young (JAGY3011601); Some younger plants present (about 3 years old) suggesting inter-fire recruitment (NAH92060603);
1/5 plants dead (AGRY0081224); Bottom end of population near 1/2 plants dead - about 100 plants live still. Unusual as on sandy soil (AGRY1022103); This locality was atlassed 12/9/92 and at least 15 plants were noted. Today I could see only 4 living adults the dead unburnt skeletons of 5 others. My theory is that the bad drought of 1993/94 killed most of these plants as the remaining plants showed no signs of disease or insect damage (NAH95012203);
More female than male (JAGY3011601); Total adult population about 30 plants with perhaps 20-25 males (NAH92060603); Approximately 500 plants area: 40m x 60m (RTUY4061804);
Most at lowest edge of shale band on edge of rocks some in rocks (AGR96052602);
This is an enormous northerly range extension, being some 85 km north of its Visgat-Onderboskloof population (NAH92091202); Of interest to follow up: I saw another potential colony some 1 km SE of this locality at about 950 m. However this is only a chancy guess as the sighting was via binoculars and in a heat haze from at least 500 m away (NAH95012203);

Confusing Species: None noted. Although some records of non-sprouting *L. salignum* might be this species. Very similar to *L. flexuosum*, which is localized, well removed and a resprouter. Unusual in having a corymbose growth habit.
Records of identification queries = 8.

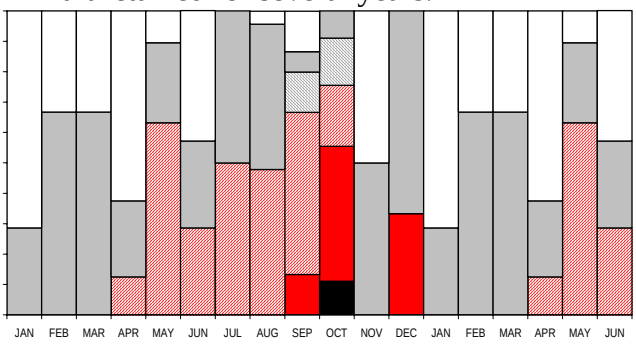
Variation and Taxonomy: No variation known.

Distribution: Add.
Spectacular range extensions.
INCLUDEPICTURE "C:\\temp\\atlas\\LDDIEM_m.jpg" * MERGEFORMAT \d

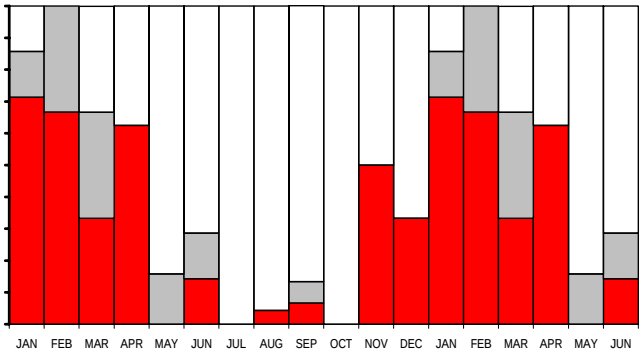
Leucadendron discolor Phill. & Hutch. 1912
Piketberg Conebush
Rooitolbos

Other Common Names: Discolor, Flame Gold Tips, Flame Goldtips, Flametip Conebush, Pompom, Red Conebush, Sunshinebush, Yellow Discolor, *Vlamtolbos, Vleigeelbos, Red Centre.*
Other Scientific Names: *decorum* var. *obovatum* Meisn. 1856.

138 Records
Population (109 records): 18% Common, 60% Frequent, 22% Rare.
Dispersion (96 records): 69% variable, 28% clumped, 3% widespread.
Flowering (137 records with: Jan 7, Feb 3, Mar 3, Apr 8, May 19, Jun 7, Jul 2, Aug 23, Sep 15, Oct 45, Nov 2, Dec 3): Buds from May to Oct; Flowering from Oct and Dec; Peak Flowering and Over not significant; Fruit from Nov to Aug; Nothing from Jan to Apr, Jun and Nov. Peak levels at 91% in Oct. Historically recorded as flowering from Sep, fruit retained for several years.



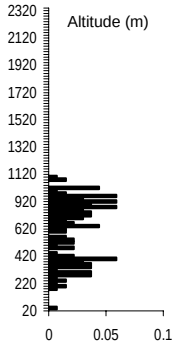
Growth (136 records with: Jan 7, Feb 3, Mar 3, Apr 8, May 19, Jun 7, Jul 2, Aug 23, Sep 15, Oct 44, Nov 2, Dec 3): Much from Nov to Apr; Rare from Feb to Mar; None from Mar to Dec. Peak levels unreliable at 100% in Feb.



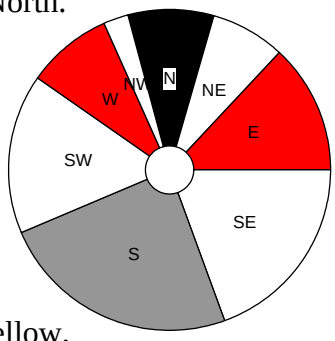
Seedlings (63 records): Absent in 90%: more seedlings than prefire adults in 3 cases. Seedlings found in Jan (3).
Fire Survival (11 records): 64% survived by seedlings only, 18% eliminated from the area by fires, 18% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 6 years, 50% estimated at 6-7 years, and 100% recorded at 7 years.

Height (137 records): 4% 0-0.2 m tall, 26% 0.2-1 m tall, 52% 1-2 m tall, 18% 2-5 m tall.
Pollinators (10 records): 90% beetles, 10% bees or wasps.
Detailed Pollinators (7 records): Monkey Beetle (4), Great Protea Beetle (3).

Habitat:
Distance to Ocean (106 records): 100% inland - further than 2 km from coast.
Altitude (106 records): 260 - 1000 m; 400 *lq* - 680 *med* - 800 *uq*m.



Landform (105 records): 68% deep soil, 25% shallow soil, 5% rocky outcrops, 3% swamp.
Slope (105 records): 52% gentle incline, 33% steep incline, 7% hill top, 7% platform, 1% valley bottom.
Aspect (91 records): 44% South, 27% East, 20% West, 9% North.



Soil Type (105 records): 67% sandy, 25% loamy, 5% rocky, 3% gravelly, 1% peaty.
Soil Colour (104 records): 58% brown, 32% grey, 5% yellow, 3% red, 1% black, 1% white, 1% orange.
Geology (99 records): 96% sandstone, 4% shale.
Vegetation (105 records): 99% shrubland, 1% suburban.

Conservation Status and Threat:
Red Data List Status: Near Threatened B1a(i,ii)b(ii,iii,iv,v) + 2a(i,ii)b(ii,iii,iv,v).
Occurrence (Fynbos): 228 km^2 with 9% conserved and 12% lost; Occupancy: 81 km^2 with 14% conserved and 12% lost. Fragmentation index: 32%.
Nature Reserves (106 records): 47% in Nature Reserves.
Habitat destruction (104 records): 88% extensive natural habitat, 10% islands, 2% naturally fragmented habitats.

Alien Invasive Species (103 records): 77% none, 18% *Pinus*, 3% Myrtaceae, 2% Fabaceae (chiefly alien *Acacia*).
Alien Density (103 records): 77% alien-free, 20% sparse, 3% abundant.

Cultivation & Utilization:
Picking (105 records): 97% no sign of picking, 2% severely picked, 1% lightly picked.
Cultivation Status: Plantings - 28 records (20%), Augmentations - 1 record, Escapes - 1 record.

Atlassers Notes:
The plants 'escaped' through the fence from a protea orchard. Owner says it doesn't occur there naturally (AWA97091301); Has "gone wild" alongside road - others are neatly cultivated. Major potential for genetic contamination in this area (NAH97050401); There was an orchard in addition to naturally occurring plants (NGF99051615);
Very few females relative to males (APE92100302);
Approximately 3 plants (WIJ94011501);
At least 3 spp of beetles on flowerheads (APE92100302); Beetles: protea and monkey and red (WIJ95101503);
Three beetles have eaten a large part of a cone (NGFY0080602);

Confusing Species: Misidentified as *L. foedum* (which has much narrower leaves and yellow – not red - flowers).
Records of identification queries = 8.
Records of corrected identification queries = 1.

Variation and Taxonomy: No significant or noted variation.
First described as *L. discolor* in 1844 by Beuk in Drege this is a *nomen nudum*.

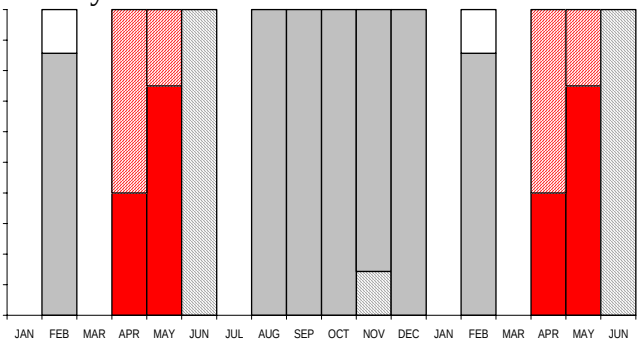
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDDISC_m.jpg" * MERGEFORMAT \d

Leucadendron flexuosum Williams 1967
Worcester Conebush

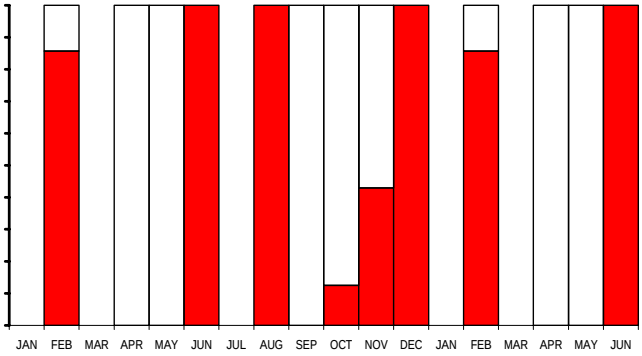
Other Common Names: None known.
Other Scientific Names: None.

44 Records

Population (43 records): 19% Common, 72% Frequent, 9% Rare.
Dispersion (40 records): 78% variable, 23% clumped.
Flowering (44 records with: Jan 0, Feb 7, Mar 0, Apr 5, May 4, Jun 1, Jul 0, Aug 1, Sep 1, Oct 17, Nov 7, Dec 1): Buds from Apr 60 to May; Flowering from Apr to May; Peak Flowering not recorded; Over from Jun; Fruit from Aug to Feb; Nothing not significant in Feb. Peak levels unreliable at 100% from Apr to May. Historically recorded as flowering from Apr to May, fruit retained for 1-2 years.



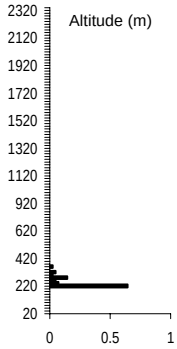
Growth (43 records with: Jan 0, Feb 7, Mar 0, Apr 5, May 4, Jun 1, Jul 0, Aug 1, Sep 1, Oct 16, Nov 7, Dec 1): Much from Feb, Jun to Aug and Nov to Dec; Rare not recorded; None from Apr to May and Sep to Nov. Peak levels at unreliable at 100% in Dec.



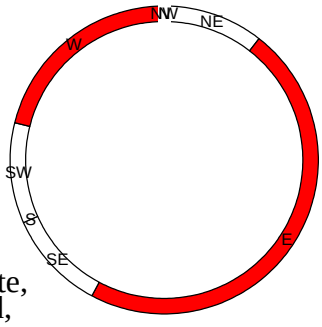
Seedlings (15 records): All without any seedlings present.
Fire Survival (9 records): 100% resprouted from underground boles.
Age to first flowering: First flowers recorded at 100% at 1 year.

Height (43 records): 51% 0.2-1 m tall, 47% 1-2 m tall, 2% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (42 records): 100% inland - further than 2 km from coast.
Altitude (42 records): 200 - 360 m; 200 $_{lq}$ - 220 $_{med}$ - 220 $_{uq}$m.



Landform (42 records): 100% deep soil.
Slope (42 records): 55% platform, 24% gentle incline, 17% valley bottom, 5% steep incline.
Aspect (19 records): 58% East, 26% West, 11% South, 5% North.



Soil Type (42 records): 55% sandy, 38% loamy, 5% gravelly, 2% rocky.
Soil Colour (42 records): 52% brown, 31% grey, 5% white, 5% yellow, 5% red, 2% orange.
Geology (35 records): 37% conglomerate, 29% sandstone, 26% shale, 9% Tertiary sands.
Vegetation (42 records): 95% shrubland, 5% agricultural lands.

Conservation Status and Threat:
Red Data List Status: Critically Endangered B1a(ii)b(i,ii,iii,iv,v)**.**
Occurrence (Fynbos): 167 km^2 with 0% conserved and 41% lost; Occupancy: 37 km^2 with 0% conserved and 49% lost. Fragmentation index: 21%.
Nature Reserves (42 records): 0% in Nature Reserves - unconserved.
Habitat destruction (42 records): 71% extensive natural habitat, 24% islands, 2% corridors, 2% naturally linear habitats.
Alien Invasive Species (42 records): 57% Fabaceae (chiefly alien *Acacia*), 21% Myrtaceae, 19% *Hakea*, 2% *Pinus*.
Alien Density (42 records): 81% sparse, 19% abundant.

Cultivation & Utilization:
Picking (37 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Far too lanky for *L. salignum* and both occurred in previous plot (AGRY0112627); Not quite right for this species but not normal *L. salignum* and growing with it (AGRY1103123); Suspected *L. flexuosum.* John Rourke says it is *L. salignum* but plants are too lanky and look like *L. flexuosum. L. salignum* also present (MAJ92082302); Both species present - this as tall lanky grey plants growing within the shorter yellow *L. salignum* (WIJY0112614);
Grazed off (AGR96042503);
About 150 plants, very localized (NAH92061704); About 200 plants in this the major population (NAH96111501);

Confusing Species: Expected confusion with *L. salignum* did not materialize, perhaps because the two species occur together and the differences are therefore obvious *in situ*.
Records of identification queries = 4.

Variation and Taxonomy: No significant variation noted
Unlike Williams we found many instances of intermediates with *L. salignum*: these are mapped.

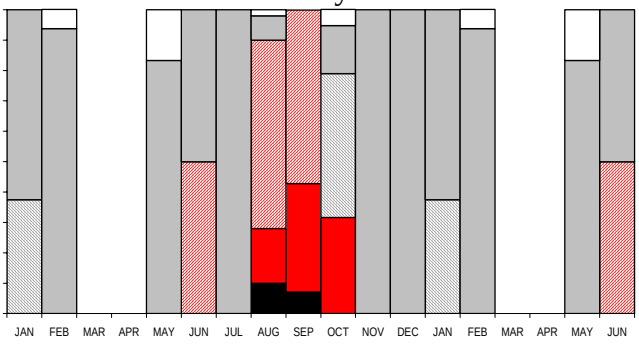
Distribution: Add.
<map intermediates>
INCLUDEPICTURE "C:\\temp\\atlas\\LDFLEX_m.jpg" * MERGEFORMAT \d

Leucadendron foedum Williams 1969
Hopefield Conebush
Hopefieldtolbos

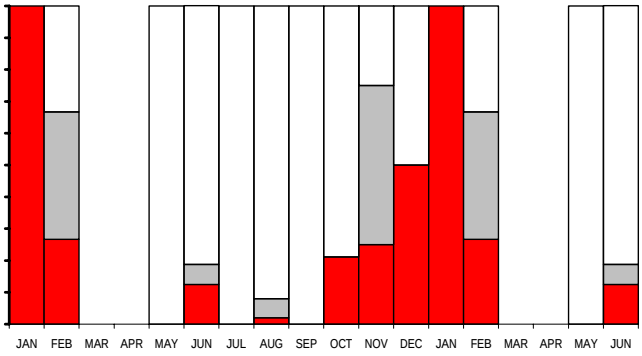
Other Common Names: None known.
Other Scientific Names: None.

147 Records

Population (145 records): 15% Common, 55% Frequent, 26% Rare, 3% Extinct.
Dispersion (120 records): 74% variable, 24% clumped, 2% widespread.
Flowering (138 records with: Jan 8, Feb 16, Mar 0, Apr 0, May 6, Jun 16, Jul 1, Aug 50, Sep 14, Oct 19, Nov 4, Dec 4): Buds from Jun to Sep; Flowering from Sep and Oct; Peak Flowering not significant; Over from Jan and Oct; Fruit from Nov to Jul; Nothing not significant. Peak levels at 100% in Sep. Historically recorded as flowering in Sep, fruit retained for some years.



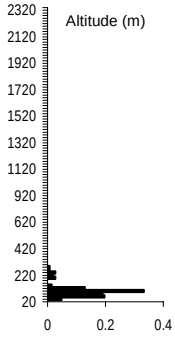
Growth (137 records with: Jan 8, Feb 15, Mar 0, Apr 0, May 6, Jun 16, Jul 1, Aug 50, Sep 14, Oct 19, Nov 4, Dec 4): Much from Oct to Feb; Rare from Feb and Nov; None from Feb to Dec. Peak levels at 100% in Jan.



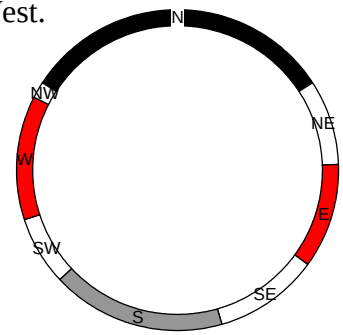
Seedlings (86 records): Absent in 95%: fewer seedlings than prefire adults in 1 case, and more in 1 case. Seedlings found in Aug and Oct.
Fire Survival (10 records): 50% survived by seedlings only, 40% eliminated from the area by fires, 10% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 3 years, 50% estimated at 3 years, and 100% recorded at 3 years.

Height (140 records): 9% 0.2-1 m tall, 77% 1-2 m tall, 11% 2-5 m tall, 1% taller than 5 m.
Pollinators (12 records): 58% flies, 42% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (146 records): 100% inland - further than 2 km from coast.
Altitude (146 records): 20 - 280 m; 60 *lq* - 80 *med* - 80 *uq* m.



Landform (146 records): 99% deep soil, 0.7% rocky outcrops.
Slope (145 records): 66% platform, 20% gentle incline, 8% dunes, 6% hill top.
Aspect (56 records): 37% North, 27% South, 20% East, 17% West.



Soil Type (146 records): 99% sandy, 1% loamy.
Soil Colour (144 records): 60% white, 17% grey, 10% yellow, 8% brown, 5% orange.
Geology (138 records): 86% Tertiary sands, 13% sandstone.
Vegetation (146 records): 99% shrubland.

Conservation Status and Threat:
Red Data List Status: Vulnerable A2c.
Occurrence (Fynbos): 1 553km^2 with 2% conserved and 44% lost; Occupancy: 208 km^2 with 1% conserved and 35% lost. Fragmentation index: 11%.
Nature Reserves (146 records): 0% in Nature Reserves - unconserved.
Habitat destruction (144 records): 70% extensive natural habitat, 26% islands, 1% road verges, 1% naturally fragmented habitats.
Alien Invasive Species (144 records): 66% Fabaceae (chiefly alien *Acacia*), 27% none, 3% Myrtaceae, 3% *Pinus*.
Alien Density (144 records): 27% alien-free, 65% sparse, 6% abundant, 3% dense.

Cultivation & Utilization:
Picking (125 records): 100% no sign of picking.
Cultivation Status: Plantings - 1 record.
Witch's Broom Infestation: 1 record (0.7%).

Atlassers Notes:
1000s of plants! (AGRY0082512-14);
Moribund (5 males and 1 female living) most females dead (AGR91101303); Senescent 2 dead - needs fire! (AGR96091105); 2 dead - veld needs a burn (AGR96091108); 1 male and 2 females - are approaching senescent stage: 1 dead female observed (NGW96091101); One plant only - natural death? It would have been height over 2 m tall (SMR98082809);
Much cattle damage (APE93060507);
With Witches Broom-like growth of sort in sandveld pincushion (AGR96102517);

Confusing Species: Northernmost populations confused when not in flower with *L. procerum* (which has red flowers, densely hairy male bracts, relatively rounded cones – not strongly dimpled, and female involucral leaves broad and ivory-white).
Records of identification queries = 10.
Records of corrected identification queries = 4.

Variation and Taxonomy: No significant variation known.

Distribution: Add.
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Leucadendron procerum (Salisb. ex Kn.) Williams 1809, 1967

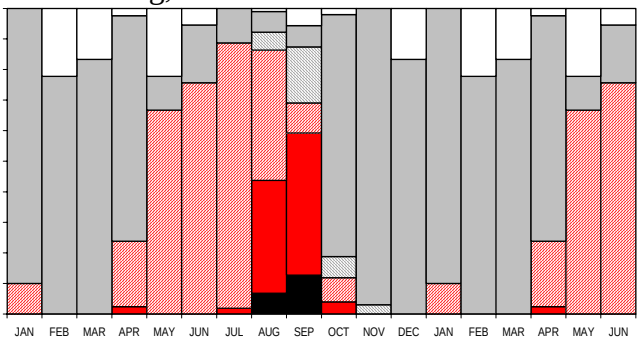
Ivory Conebush

Langbeentjie

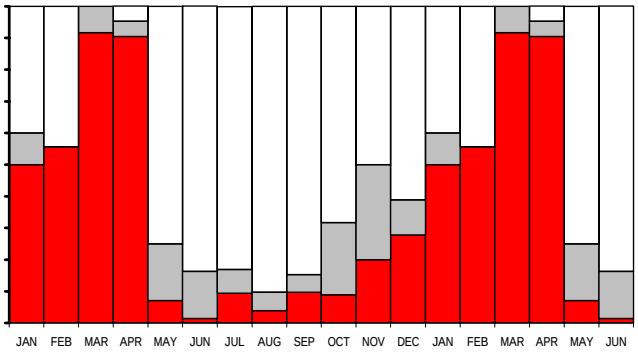
Other Common Names: Lanky Conebush, Tall Eurystermum, *Katstert, Kienabossie, Kinabossie, Pinangbossie.*
Other Scientific Names: *concinnum* R.Br. 1810, *glabrum* var *obtusatum* Meisn. 1856. *lanigerum* (Buek in Drege) 1844.

566 Records

Population (559 records): 29% Common, 56% Frequent, 15% Rare.
Dispersion (524 records): 71% variable, 28% clumped.
Flowering (553 records with: Jan 10, Feb 9, Mar 12, Apr 42, May 27, Jun 74, Jul 53, Aug 103, Sep 71, Oct 101, Nov 33, Dec 18): Buds from Apr to Aug; Flowering from Aug to Sep; Peak Flowering not significant; Over from Sep; Fruit from Oct to Apr; Nothing from Feb and May. Peak levels at 92% in Aug. Historically recorded as flowering from Aug, fruit retained.



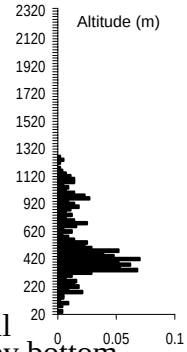
Growth (552 records with: Jan 10, Feb 9, Mar 12, Apr 42, May 28, Jun 74, Jul 53, Aug 103, Sep 72, Oct 101, Nov 30, Dec 18): Much from Nov to Apr; Rare from Oct to Nov; None from May to Feb. Peak levels at 100% in Mar.



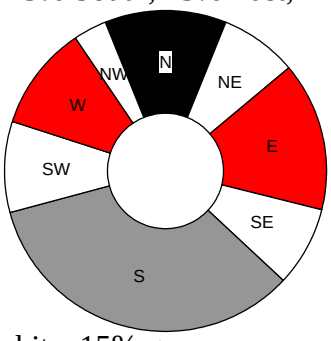
Seedlings (189 records): Absent in 97%: fewer seedlings than prefire adults in 2 cases, and more in 1 case. Seedlings found in Jul, Aug and Sep.
Fire Survival (20 records): 85% survived by seedlings only, 5% eliminated from the area by fires, 5% escaped fires in fire-safe areas, 5% resprouted from underground boles.
Age to first flowering: First flowers recorded at 100% at 2 years.

Height (558 records): 8% 0.2-1 m tall, 35% 1-2 m tall, 54% 2-5 m tall, 2% taller than 5 m.
Pollinators (20 records): 75% beetles, 15% flies, 10% bees or wasps.
Detailed Pollinators (6 records): Monkey Beetle (2), Green Beetle (2), Green Stripy Beetle, Green Monkey Beetle.

Habitat:
Distance to Ocean (556 records): 100% inland - further than 2 km from coast.
Altitude (556 records): 20 - 1160 m; 340 *lq* - 420 *med* - 520 *uq*m.



Landform (553 records): 91% deep soil, 8% shallow soil.
Slope (554 records): 68% gentle incline, 17% platform, 10% hill top, 2% steep incline, 2% valley bottom.
Aspect (441 records): 43% South, 23% East, 18% North, 17% West.



Soil Type (552 records): 89% sandy, 4% gravelly, 4% rocky, 3% loamy.
Soil Colour (547 records): 33% brown, 22% yellow, 17% white, 15% grey, 8% orange, 5% red.
Geology (542 records): 86% sandstone, 7% Tertiary sands, 5% silcrete or ferricrete, 1% shale.
Vegetation (552 records): 99% shrubland.

Conservation Status and Threat:
Red Data List Status: Vulnerable A4c.
Occurrence (Fynbos): 4 490 km^2 with 10% conserved and 23% lost; Occupancy: 547 km^2 with 3% conserved and 25% lost. Fragmentation index: 9%.
Nature Reserves (556 records): 4% in Nature Reserves - unconserved.
Habitat destruction (549 records): 69% extensive natural habitat, 26% islands, 3% naturally fragmented habitats, 1% road verges, 1% naturally linear habitats.
Alien Invasive Species (541 records): 76% none, 20% Fabaceae (chiefly alien *Acacia*), 3% *Pinus*, 1% Myrtaceae.

Alien Density (539 records): 76% alien-free, 22% sparse, 2% abundant.

Cultivation & Utilization:
Picking (378 records): 100% no sign of picking, 0.3% lightly picked.
Cultivation Status: Plantings - 5 records.
Witch's Broom Infestation: 3 records (0.5%).

Atlassers Notes:
Very wide leaf and narrow leaf males in this small isolated population: leaves twice normal width (AGR93071807); Leaf dimensions (leaf and cone) very big – especially from Gifberg (AGR95081202); With very broad leaves (AGRY0102806); Males resemble *L. loranthifolium* (AMMY2110508);
Some of these would have been over 5 m tall if they had been upright (SMRY0062207); Some exceeding 5 m (WIJ94041202, WIJY0081904);
Appears virtually senescent (NAH95091406);
Most plants dead, 4 seen dead (AGRY0062207); Some bushes half dead (AGRY0100106); Many young plants came up 'through' fallen dead mother (AWA97082103); Very mixed in size (AWA98082804);
Solitary male (NGW96091109);
Most female cones aborted this year while still very small - no cones this year seen (AGRY0103044);
Ants crawling on flowerheads (AWA98083002);
Used for firewood - many plants (presumably dead) removed (AGRY0092305);
Only on edge of old land (AGR95081210);
Dense woody 'cups' of dead leaves - Witches Broom? (AGR95070605);

Confusing Species: Confused when not in flower with the northernmost populations of *L. foedum* (narrower female involucral leaves, and yellow, not reddish, flowers).
Records of identification queries = 39.
Records of corrected identification queries = 30.

Variation and Taxonomy: No significant variation known to Williams, but atlassers have identified broad-leaved plants on the Gifberg.

Distribution: Add.
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Leucadendron salignum Bergius 1766
Common Sunshine Conebush
Knoppiesgeelbos

Other Common Names: Adscendens, Clustered Euryspermum, Common Yellowbush, Goldentips, Goldtips, Goldtops Conebush, Incisum, Mini Tulip Conebush, Nest-flower Conebush, Red Adscendens, Strictum, Trailing Euryspermum, *Asbos, Duineknoppiesbos, Geelbos, Geelknoppies, Geelknoppiesbos, Knopbos, Knoppiesgeelbos, Kraaltolbos, Rooibos, Stompieknopbos, Tolbos, Blush, Devils Blush, Highlights, Red Devil, Winter Red, Yellow Devil.*

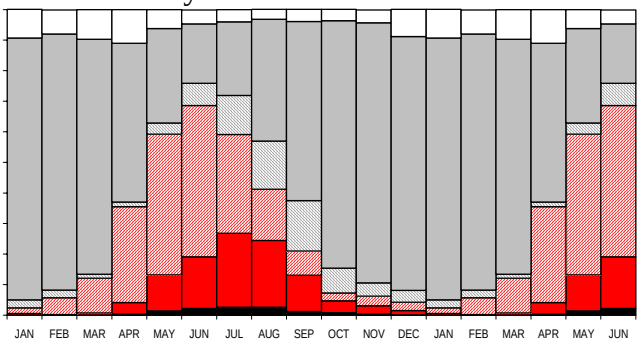
Other Scientific Names: *adscendens* R.Br. 1810, *argentea* var. *δ* L. 1753, *conifera* var. *ε* L. 1762, *diversifolia* (Willd.) 1809, *frondosum* Salisb. ex Knight 1809, *humifusum* Salisb. ex Knight 1809, *involucratum* Meisn 1856, *involucratum* Roem & Schult 1818, *nudiflorum* Salisb. ex Knight 1809, *pallens* (L.) 1771, *pallens* var. *adscendens* (O.Kuntze) 1898, *pallens* var. *erecta* (O.Kuntze) 1898, *pallida* (Salisb). 1796, *salignum* (L.) 1771, *virgatum* R.Br. 1810.

24 657 Records

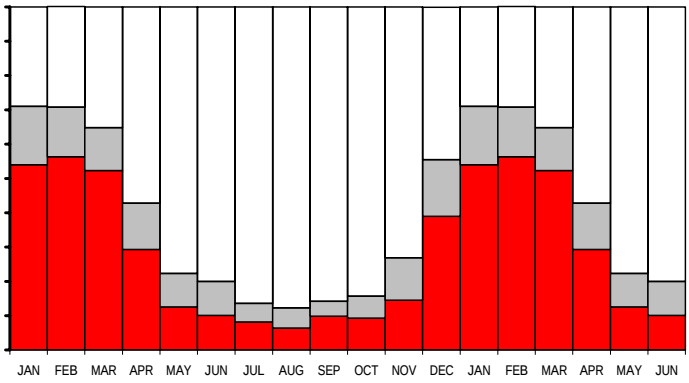
Population (24521 records): 35% Common, 54% Frequent, 10% Rare.

Dispersion (23100 records): 77% variable, 12% clumped, 10% widespread, 1% evenly distributed.

Flowering (23819 records with: Jan 1632, Feb 1663, Mar 2435, Apr 1636, May 1697, Jun 1718, Jul 1785, Aug 2246, Sep 2452, Oct 2855, Nov 2147, Dec 1553): Buds from Apr to Jul; Flowering from Jul to Aug; Peak Flowering and Over not significant; Fruit from Jul to May; Nothing not significant. Peak levels at % in. Historically recorded as flowering from Apr to Nov, varying from place to place, fruit not released immediately.



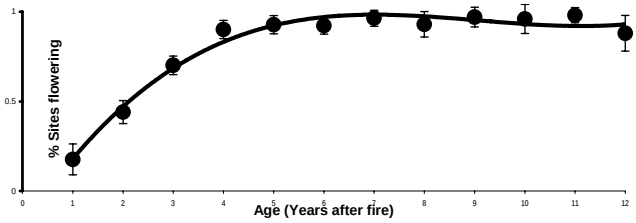
Growth (23458 records with: Jan 1622, Feb 1667, Mar 2419, Apr 1600, May 1662, Jun 1681, Jul 1730, Aug 2224, Sep 2402, Oct 2801, Nov 2113, Dec 1537): Much from Dec to Apr; Rare not significant; None from all year round. Peak levels at 71% in Jan.



Seedlings (9452 records): Absent in 96%: fewer seedlings than prefire adults in 148 cases, and more in 45 cases. Seedlings found all year round in Jan (19), Feb (7), Mar (15), Apr (12), May (11), Jun (20), Jul (31), Aug (15), Sep (24), Oct (12), Nov (14) and Dec (13).

Fire Survival (1825 records): 92% resprouted from underground boles, 5% escaped fires in fire-safe areas, 1% survived by seedlings only, 1% resprouted from aerial trunks.

Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2 years, and 100% recorded at 17 years, with a slight decline after 21 years.



Height (24076 records): 4% 0-0.2 m tall, 76% 0.2-1 m tall, 20% 1-2 m tall.

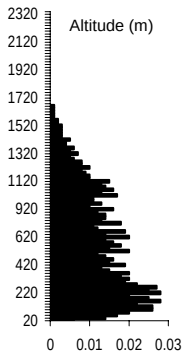
Pollinators (69 records): 49% beetles, 23% flies, 14% bees or wasps, 9% none observed, 3% birds, 1% butterflies or moths.

Detailed Pollinators (21 records): Monkey Beetle (15), Honey Bee (2), Scarab Beetle, Green Monkey Beetle, Great Protea Beetle, Conebush Beetle.

Habitat:

Distance to Ocean (24147 records): 91% inland - further than 2 km from coast.

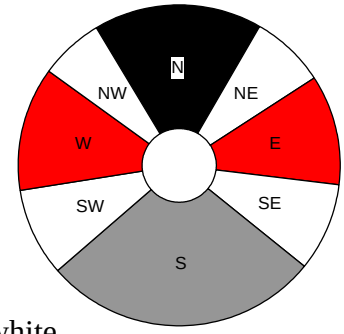
Altitude (24149 records): 20 - 1940 m; 220 *lq* - 480 *med* - 800 *uq*m.



Landform (23845 records): 74% deep soil, 22% shallow soil, 4% rocky outcrops.

Slope (23853 records): 50% gentle incline, 30% steep

incline, 11% platform, 6% hill top, 2% valley bottom.
Aspect (20373 records): 37% South, 24% North, 20% West, 19% East.



Soil Type (23600 records):
52% sandy,
29% loamy,
9% gravelly,
5% rocky,
4% clayey.
Soil Colour (23520 records):
43% brown,
40% grey,
5% orange, 5% white,
3% yellow, 2% black, 2% red.
Geology (23031 records): 74% sandstone, 12% shale, 4% Tertiary sands, 3% granite, 3% silcrete or ferricrete, 2% limestone, 2% conglomerate.
Vegetation (24049 records): 96% shrubland, 1% grassland, 1% plantations.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 50 135 km^2 with 22% conserved and 19% lost; Occupancy: 17 353 km^2 with 26% conserved and 21% lost. Fragmentation index: 9%.
Nature Reserves (24149 records): 36% in Nature Reserves.
Habitat destruction (23425 records): 86% extensive natural habitat, 9% islands, 2% road verges, 1% naturally linear habitats,.
Alien Invasive Species (23071 records): 47% none, 22% Fabaceae (chiefly alien *Acacia*), 18% *Pinus*, 10% *Hakea*, 2% Myrtaceae.
Alien Density (22990 records): 47% alien-free, 39% sparse, 10% abundant, 3% dense.

Cultivation & Utilization:
Picking (16834 records): 100% no sign of picking, 0.1% lightly picked, 0.01% severely picked.
Cultivation Status: Plantings - 11 records, Augmentations - 1 record.
Witch's Broom Infestation: 17 records (0.07%).

Atlassers Notes:
Large plants:
These are the biggest and oldest plants I have seen (AKS95111507); Lots of plants over 2 m (AWA98071303); Some plants up to 1.5 m tall (CVV99031401); Some plants were over 2 m high and 2 m broad (JAG95082201); AH Some plants over 1 m tall (JAT97113004-6, SGAY1020715); Exceptionally Tall And Vigorous (OGM93091507); A couple of female plants over 1 m tall (SHR92042505); Old veld - some plants were over 2 m tall! (SMRY2050201); Very tall amongst *Protea mundii* up to 5 m (WAM92122901);
Dwarf forms:
Cones quite small 15 X 15mm (AJT92071101); Large mat bushes less than 200 mm high (AKS96013104); A small percentage of plants displaying a very sprawling habit much like *Leucospermum prostratum* (CJL98062504); In this area it has a small leaf variety with cones much smaller than normal. these multi-stemmed platns are noticeably smaller than the other *salignum*, though these are also smaller than elsewhere in this neighbourhood (CVV95100803); Very low growing – barely over 200 mm (JAT96032201+2); Small leafed low bush (JAT97050101); There appears to be a dwarf form 300-400 mm tall, as well as the usual one (VJK93101003); Very stunted (VJK93041801);
Other involucral bract forms:
Peculiar no 'boat shape' form of involucral bracts! (AGR96042506); Looked quite different had hairy cones and was resprouting but the leaves surrounding cones were very loose (IEB99102711); Open bracts not clasping stem (IEBY0032801); Cones exposed (LYM95071001); Here doesn't have boat shaped involucral leaves around cone or flowerheads (MCG99011901); Unusual: female involucral leaves (70 x 10 mm) were splayed revealing heads with small brown bracts at the base (SHR92042505); Female cones not enclosed by involucral leaves; cone bracts carmine (SHR94123101); Cones not enclosed by involucral leaves (SHR95092301); This is a funny fuzzy form without the involucral leaves (more like *L. pubescens*). it has smooth leaves but dimpled cones resembling *L. lanigerum*. The habit is not *lanigerum* though. It is common on the top of Ezelfontein (AGR99102708);
Ld flexuosum form:
Peculiar form approaching *L. flexuosum* (AGR96042507); Normal (AGR96042508); Atypically tall and narrow bushes and unhappy thin leaves - showing some features of *L. flexuosum* but still typically *salignum* (CHE98082007); Some plants are very spindly and do approach *L. flexuosum*! (LYM96102601, SMRY2022810, VDW97020706,8,10); Lanky form (LYMY0080903);
Ld lanigerum form:
'Rough' type approaching *L. lanigerum* - impossible to tell intermediates (AGR98082008); *L. lanigerum* type form (AGR98100905, LYM98100902-3, 7-8); Very *l. lanigerum*-like in features! (AGR99060907); Both normal type and *lanigerum* - lookalike type at the site (AGRY0101904+5); Present in normal and *L. lanigerum* types (DJLY0101908); some are *lanigerum* type (GEKY0101905-7); This is a rough leaf growth form - cf *L. lanigerum* of *salignum*: this needs to be looked at more closely (IVM98082008); Form like smooth *L. lanigerum* (SMR98082007);
Other morphological forms:
Fine leaved and broad leaved present together - surely more than 1 species! (DJL99040801); Had strange long thin leaves - like *L. eucalyptfolium* - due to it reaching for the light? (HCE96062204); Might be very narrow-leafed form (OUT93060601); Very variable in general / bushy and scrambly and some very fine leaves - several mature plants of both sexes were single stemmed (SMR99040801);
Females have such big leaves and flowerheads that I kept on checking close up whether they really were (AWA96111903); Much broader

leaves than usual but also resprouter and hairy cones (HRK96010501); Single-stemmed similar to *L. tradouwense* in colour, only slightly smaller leaves and silver cone (VJK93091201); Had very thin bracts it was therefore 'funny' (NGF96042505-6);
Approaching *L. modestum* in appearance (WMP93011606);

Colour forms:

Red form! (AGR93071716-17, AGR93071729 + 31, AGRY0081705, DOA95050111); Redder form predominant (AGR97022514); Deep red form (DOA95050110); Very deep red (OUT94021904+5, OUT95040103); Very red (OUT95102802,3,5,7,9, OUT96012702); Dramatic red (SMR99092401); Colourful red form (SMRY0072106); Some red leaf (CFRY0072105); Red flower form (TLE94082804);
Tall red-stalked Koue Bokkeveld variety (JAT93112101);
With some yellow and some red plants (AGR92051601); Red buds on some male buds (AGR92082503); Yellow form predominant (AGR97022513);
Mostly yellow heads but some with red along edges of leaves (NJH93082601);
2 forms present - smaller reddish form and large leaved yellow form (AGRY0121222); 2 forms: yellow form typical mainly on sandstone - red form with rounded open head (ie no cup of bracts) on the shale (AGRY3112623);
Lovely fertile valley rich in *salignum* many of which were pink rather than yellow (DFJ97030201);

Flowering – geographical differences:

A small proportion are a bright red form which are still in full flower, yellow forms all finished (AGRY0081216); Buds forming here whereas lower down - on Cloetes Pass - it is already starting to bloom (AWA99061604);
Everywhere else is in cone but here in full bud! (AWA99101001); The dwarf is in peak flowering whereas the usual flowering time is June-July (VJK93101003); Has been flowering a long time - since June (VJK96091501); At the bottom of the cliff are still flowering - hard to explain: usually June (VJK97080809); Has flowered and seeded this year which is very early: normal time is June onwards (VJKY0051702);
Busy with a second flowering flush this year (AGRY2112118);

Flowering – sexual differences:

Only males (about half) in flower, females not even in bud (AGR92042504); Females not in bud: males only (APE92051621); Being awkward again - a few male bushes in all its yellow glory majority while female flowerheads eaten by goggas (AWA95101001); Some plants oddly in bud (SHRY1021401); The male plants are starting flower and are changing colour from light green to yellow - seems a bit early! (VJK93040701); The male flowerheads at peak flowering while female plants still in bud stage (VJK96052602); Only males in flower, females showed no flowering (WIJ92072601); Males in bud (WIJ93051502, WIJ93051609);

Cone predation and opening:

Most cones destroyed by worms (AWA95091903); Female flowerheads eaten by goggas (AWA95101001); Buds mostly parasitized (PMRY0070101);
All cones greater than 3years old open - seed released (HRKY0071102);

Resprouting:

(Records of resprouting, and resprouting after fire omitted)
High proportion of plants single stemmed - presumably due to plantation and lack of fire (ASP95051710); Many plants have single stems with no evidence of resprouting (PMR96061901); A number of young plants - ones which had not resprouted - were seen (PVR96033001); Several mature plants (both sexes) were single stemmed (SMR99040801); Some single stemmed but not the big old ones (SMR99040806); Several were single stemmed even some of the large ones (SMRY0041202); Several old ones single stemmed - i suspect only one resprouted trunk survives - also noticed old plant with 2 trunks growing and 2 dead trunks lying still attached - and another with 2 old trunks and a few 10cm sprouts from the rootstock (SMRY0041203); Again a few old ones were single stemmed (SMRY0041207); 3 resprouters & one " seedster" (VJK96090101); Some with single stems - probably never burnt (WIJ93082604); FS Several bushes on single stems - in very old veld (WIJ94070101); Non-resprouting - old veld (WIJ95090901); One resprouting from the trunk which was single (WIJ97042607);
Lots of plants killed - not resprouting (AGR92071204); Some plants also had not resprouted and seemed dead (SMRY2062709); Some plants killed by fire (SMRY2062710); Most plants senescent (NAH96090701);
There were a few seedlings as well as the resprouting plants (SMRY2050206);
Heat wave? or wind? killed the above ground portions - which is resprouting (AGRY0112301);
One plant which had been bush cut was resprouting from a stem 1 m up. the stem was lying horizontal to the ground: unusual as it normally resprouts from the bole (NGFY0022001);

Herbivore damage:

All plants chomped - bits lying around by *Otomys* (AGR96081502); *Otomys* damage (NGF96081005);
Lichen covered shorter ones munched/ browsed by cattle (CFRY0061714); Heavily cropped - eaten! (CFRY2062704); Grazed (SMR96090512); No picking but much horse plucking (VJK95061603);
Green caterpillar eating leaf (LYM97081305); Some female flowers eaten by caterpillars (TLEY0043006);
Piles of plants due to bulldozing (CJL98062001);
Also in pastures (presumably converted by bushcutting and burning) (AGRY1030725); In grassy pasture area (SGAY1010808);

Parasitism:

Infested with some insects (AJT92080201);
Ants present - they appeared to be tending green soft bodied scale insects (BWA94090201);
Ladybirds hibernating in old cones (VCH98121702);
Diseased browning - black spots on the stems (CFRY0061809);

Mystropetalum species under bush (SMR97021207);

Mortality:

3 dead plants since last fire (AGR99032621); 1 dead female also seen between rd and plantation (AGR91120102); 1/3 Of plants dead - recently - too dry? (AGRY0081208); Lots of dead - see PAN 48 (AGRY0110222); Half plants dead (AGRY0112102);Lots of dieback and regrowth (see Nov SRS) (AGRY0112206); All have high mortality - more dead than living parts in portions of the plot (AGRY1012101); 1 dead plant seen (AGRY1022126); Most dead or resprouting (drought?) (AMMY0112205); Signs of dying (GEKY0101907); Looking very stressed (IEB99120802); Many of the plants dying (OUT97052410); Lots of die-back (OUT98040409); Wide sweep of dieback down centre of valley; (OUT99050705), Lots dead (WMPY1012107);

Sex ratios:

Males only (AGR91100608, AGR92012203, AGRY4031008, AJT94040204, ASP94071413+14, CBE92051202, GYC93121604, SMR97012901, SMR99080901); Mostly male (SMRY0030103); Isolated plants are usually males (AGR91121207); Many big healthy males and few straggly female (SMR99030407);

Recruitment:

Good recruitment or many young (AGR92122801-2, AGR92123008, AGR92123101, AWA96111905, AWA98091308); An impressively dense stand! (AGRY3103052);

Pollination:

Big ants scurrying on flowerheads (AWA98103104); Beetles present has fringe of dense hairs around the abdomen (grey) and white and black markings on the elytra (GNI93102501);

Witches Broom:

Some plants have fasciation type multiple leaf growth deformity (AKS93062301); Some fasciation seen - many small leaves: rather attractive (SMR99040805);

Miscellaneous:

What I love about *L. salignum* in this game of hide and seek for protea species is that it always gives the other species away and sure enough not long after finding *L. salignum* we found our prize: *Paranomus roodebergensis* hiding in the tallish fynbos (VJK99060401);

Confusing Species: Despite being a resprouter the following non-sprouters were confused with *L. salignum*, mostly by beginners: *coniferum* (1%), *eucalyptifolium* (3%), *laureolum* (1%), *meridianum* (1%), *pubibracteolatum* (3%), *salicifolium* (4%), *strobilinum* (1%), *tinctum* (3%), *xanthoconus* (15% - but has fine, adpressed, silvery-haired leaves).

The following resprouters were misidentified: *L. flexuosum* (9%, but with longer and fewer erect stems and smaller leaves), and the following subspecies of *L. spissifolium* (all of which have hairless cones, a more robust erect habit, and shiny green (not glaucous) leaves): *fragrans* (15%, which is the most similar in leaf-shape), *phillipsi* (21%, which is most similar to males, and indeed female plants are often required to be certain of identification), and *spissifolium* (19%).

Apart from atlassers, many taxonomists have been confused by this species (especially since the easily observed resprouting habit is not detectable on herbarium sheets, not to mention the ignorance of the separate sexes in the genus by early botanists), as attested by the very many scientific synonyms and wrong identifications. In fact, the family probably owes its name "*Protea*" in no small part to this species: Linnaeus himself described it as 5 species and varieties! Salisbury, who did know about the sexes, described 3 species and Brown 2 within this species.

In the herbarium unless resprouting is noted, it is easy to confuse this species with *L. procerum* and *foedum*.

Records of identification queries = 168.

Records of corrected identification queries = 67.

Variation and Taxonomy: Williams states that female plants may have very broad or rather narrow involucral leaves often within the same population. However, many atlassers noted that the narrow and broad leaved forms, while intermixing, tended to dominate locally on some geologies, especially those on granite and shale bands were often dominated by a form not so prevalent on adjacent sandstone substrata. Not noted in the literature is that the different forms often are correlated with different levels of glaucescence and propensity to bright colours when flowering, and often more or less sprawling habit, and even detectable differences in flowering time. However, the permutations of these is simply overwhelming and impossible to disentangle without a dedicated study!

Williams notes that there is little variation between populations, but then goes on to note the following forms:

- No apparent variation: coastal belt of Cape Town to Grahamstown;
- Leaves shorter than usual: Nieuwoudtville;
- Populations with red buds mixed with yellow buds: Vanrhynsdorp, Clanwilliam, Piketberg and Ceres divisions;
- Individuals with colourful leaves may occur among those with yellow or green leaves: localities not specified.
- Much larger leaves than normal: north side of Langeberg and Outeniqua Mountains in Riversdale, Outeniqua and George divisions;
- Very colourful big leaves: Langkloof in George and Uniondale divisions;
- Male plants with broad involucral leaves, growing between normal male plants: Langkloof at Noll;

All of these forms have zones in which they blend with the more typical forms. Taxonomy is complicated by herbarium specimens not retaining colour, this thus being a useless taxonomical feature. Most of these characters appear to be genetically fixed (Williams 1972), although it is reputed that the colourful Langkloof forms are constant, whereas the

Koue Bokkeveld forms require a cold snap to bring out the colours.
Atlassers have suggested that these forms are local adaptations to local geologies, but with a very few exceptions, they tend to blend into the more typical and ubiquitous sandstone/quartzite form.

Distribution: Add.
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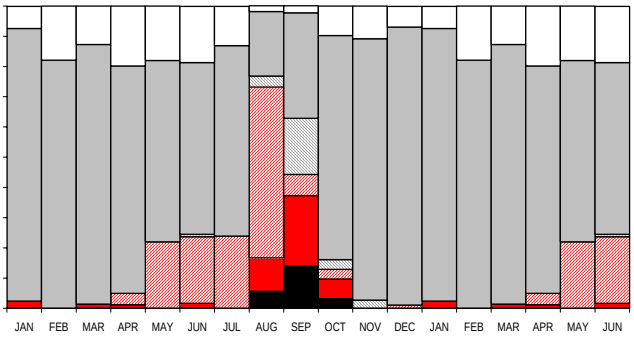
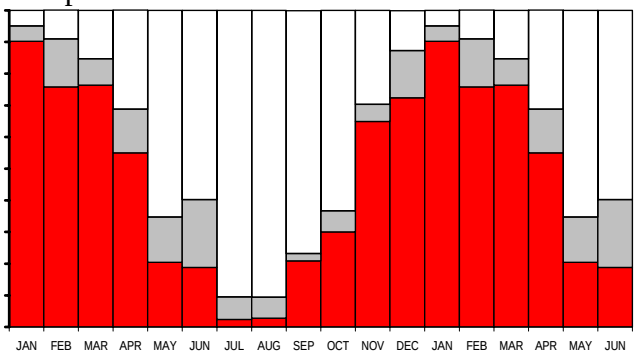
Leucadendron coniferum (L.) Meisn. 1781, 1856
Dune Conebush
Duinegeelbos

Other Common Names: Dune Yellowbush, Dusty-pink Conebush, Large Pink Cone, Mucro-leaf Conebush, Narrow Goldtips, Sabulosum, Willow-like Euryspermum, *Geelbos, Rooitolbos.*
Other Scientific Names: *argentea var β* (L.) 1753, *inflexum* Link 1821, *sabulosum* Salter 1943, *salignum* Salisb. ex Knight 1809.

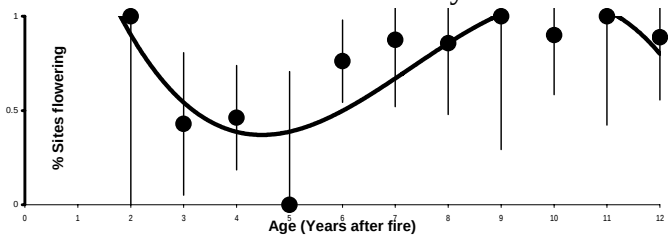
870 Records
Population (790 records): 1% Abundant, 36% Common, 47% Frequent, 15% Rare.
Dispersion (647 records): 75% variable, 20% clumped, 3% widespread, 1% evenly distributed.
Flowering (781 records with: Jan 41, Feb 67, Mar 71, Apr 81, May 50, Jun 118, Jul 46, Aug 108, Sep 43, Oct 31, Nov 37, Dec 88): Buds from May to Aug; Flowering from Sep; Peak Flowering and Over not significant; Fruit from all year round; Nothing from Apr to Jun. Peak levels at 77% in Aug. Historically recorded as flowering from late Aug to early Sep, fruit only released after fire.



Growth (770 records with: Jan 41, Feb 66, Mar 72, Apr 80, May 49, Jun 117, Jul 42, Aug 106, Sep 43, Oct 30, Nov 37, Dec 87): Much from Sep to May; Rare from Jun; None from Apr to Nov. Peak levels at 95% in Jan.

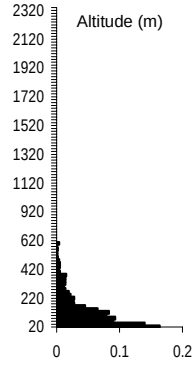


Seedlings (245 records): Absent in 92%: fewer seedlings than prefire adults in 5 cases, and more in 5 cases. Seedlings found in Jan (2), Feb, Apr (3), Jun, Jul, Aug and Sep.
Fire Survival (39 records): 72% survived by seedlings only, 26% escaped fires in fire-safe areas, 3% resprouted from underground boles.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 4-5 years, and 100% estimated at 9 years, with some evidence of senescence after 19 years.

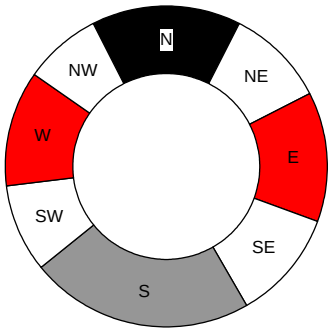


Height (781 records): 30% 0.2-1 m tall, 47% 1-2 m tall, 22% 2-5 m tall.
Pollinators (3 records): 67% beetles, 33% bees or wasps.
Detailed Pollinators (1 record): Honey Bee.

Habitat:
Distance to Ocean (780 records): 54% inland - further than 2 km from coast.
Altitude (780 records): 20 - 600 m; 20 *lq* - 60 *med* - 100 *uq* m.



Landform (698 records): 87% deep soil, 8% shallow soil, 3% rocky outcrops, 2% swamp.
Slope (700 records): 52% gentle incline, 28% platform, 8% steep incline, 5% dunes, 4% hill top, 3% valley bottom.
Aspect (489 records): 32% South, 25% East, 23% North, 20% West.



Soil Type (690 records): 78% sandy, 17% loamy, 2% gravelly, 1% clayey, 1% rocky.
Soil Colour (685 records): 61% grey, 23% brown, 13% white, 1% black, 1% orange.
Geology (726 records): 48% sandstone, 26% limestone, 21% Tertiary sands, 2% silcrete or ferricrete, 2% shale, 1% granite.
Vegetation (775 records): 98% shrubland, 1% thicket.

Conservation Status and Threat:
Red Data List Status: Vulnerable A2c + 4c.

Occurrence (Fynbos): 3 566 km^2 with 19% conserved and 33% lost; Occupancy: 705 km^2 with 23% conserved and 31% lost. Fragmentation index: 9%.
Nature Reserves (780 records): 42% in Nature Reserves.
Habitat destruction (690 records): 83% extensive natural habitat, 8% road verges, 6% islands, 1% naturally linear habitats, 1% corridors.
Alien Invasive Species (684 records): 71% Fabaceae (chiefly alien *Acacia*), 22% none, 2% Myrtaceae, 2% *Pinus*.
Alien Density (682 records): 22% alien-free, 44% sparse, 19% abundant, 12% dense, 2% impenetrable.

Cultivation & Utilization:
Picking (559 records): 98% no sign of picking, 1% lightly picked, 0.4% severely picked.
Cultivation Status: Plantings - 27 records (3%), Augmentations - 3 records, Escapes - 43 records (5%).
Witch's Broom Infestation: 1 record (0.1%).

Atlassers Notes:
One old tree covers a diametre of 4-5 m (CVV96030805); Some plants higher than 5m (LYM96062701);
Some appear to be resprouting or at least to have several branches from below soil surface - others have single stems some older unburnt bushes also seen at roadside (WIJ94040403);
L. coniferum X xanthoconus - just a few hybrid plants - 80% *coniferum* - on upper edge of pure *coniferum* lower down and *xanthoconus* higher up to west (AGRY4082403);
Showing slight features of *L. eucalyptifolium* (slight reddening of buds and a bit of a cup around the female, but not on the male) (AGRY1031406);
Superficially very similar to *L. meridianum* and easily mistaken, but has much fewer hairs on leaves and less hairy cones: not very pure *coniferum* but unmistakably it (AGRY1031410);
All moribund and 1 dead female (AGR92050901); 2 recently dead plants (AGRY1080903);
Males only (AGRY0090820); Only1 male (AJT93060506); 1 female and 2 male bushes (CVV97090202); 1 male and 1 female bush (CVV98100901); Female plants isolated - males in clumps of dense bushes (DJL94090505);
Seems To Be Newly Established On This Site Whether By Dumping Of Cut Down plants or seed overflow from populations on sites above (CJL98062001); Also seems planted as it is around a ranger's home - might be "natural" but leaves look too large (DFJ99042101);
Augmented by road verge in regeneration campaign - not supposed to be here? - all seem escaped (AGR96031503); All plants within 5-6 m of the road - seeded from transported cutflower proteas? (SMRY0052410);
Cut off dead branches dumped on the side of the road (LYM97061802);
Large black & yellow beetle seen on some cones (CVV97090201);
One had Witches Broom in the form of a tight bunch of little branches with tiny leaves (SMR99052006);

Confusing Species: Confused with *L. xanthoconus* (82% of corrected queries, but has silver-sheen leaves with adpressed hairs, and bilobed cone bracts) and *meridianum* (18%, with leaves more obtuse and with silvery-grey pubescence).
Records of identification queries = 67.
Records of corrected identification queries = 44.
,

Variation and Taxonomy: No variation noted, other than can be attributed to localized hybridization.

Distribution: Add.
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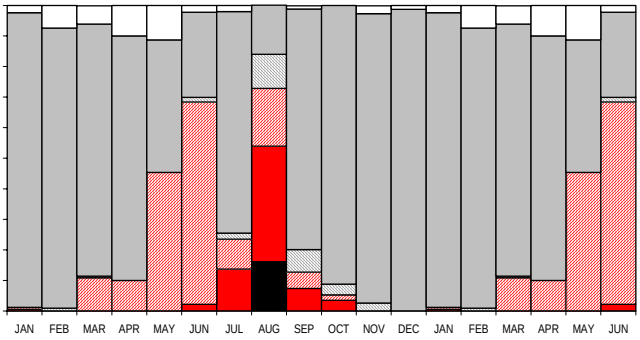
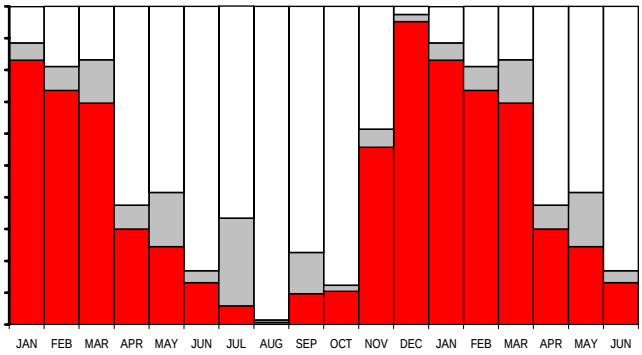
Leucadendron meridianum Williams 1967
Limestone Conebush
Silwertolbos

Other Common Names: Silky Conebush, Silvercones, Silvertops, *Astolbos, Geelbos, Kliptolbos, Koppiestolbos.*
Other Scientific Names: None.

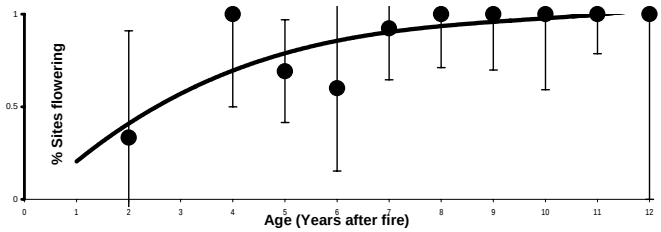
1447 Records
Population (1409 records): 3% Abundant, 53% Common, 38% Frequent, 6% Rare.
Dispersion (1308 records): 82% variable, 12% clumped, 5% widespread, 1% evenly distributed.
Flowering (1335 records with: Jan 167, Feb 108, Mar 183, Apr 40, May 53, Jun 136, Jul 51, Aug 143, Sep 94, Oct 57, Nov 76, Dec 227): Buds from May to Jun; Flowering from Aug; Peak Flowering not significant - in Aug; Over not significant; Fruit from Sep to Jul; Nothing from not significant. Peak levels at 84% in Aug. Historically recorded as flowering from Jul, fruit retained until fire.



Growth (1325 records with: Jan 166, Feb 106, Mar 184, Apr 40, May 53, Jun 136, Jul 51, Aug 142, Sep 93, Oct 57, Nov 70, Dec 227): Much from Nov to May; Rare from Jul; None from Apr to Nov. Peak levels at 97% in Dec.

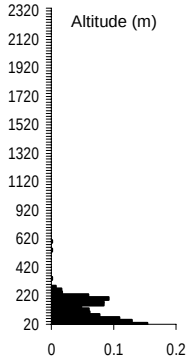


Seedlings (626 records): Absent in 95%: fewer seedlings than prefire adults in 4 cases, and more in 11 cases. Seedlings found in Jan (3), Feb (2), May, Jun, Jul and Dec (7).
Fire Survival (30 records): 70% survived by seedlings only, 20% escaped fires in fire-safe areas, 10% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% estimated at 8 years.

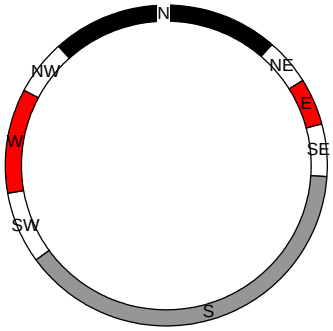


Height (1354 records): 20% 0.2-1 m tall, 60% 1-2 m tall, 19% 2-5 m tall.
Pollinators (5 records): 100% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (1424 records): 87% inland - further than 2 km from coast.
Altitude (1424 records): 20 - 280 m; 20 *lq* - 60 *med* - 100 *uq* m.



Landform (1361 records): 58% deep soil, 40% shallow soil, 2% rocky outcrops.
Slope (1363 records): 36% gentle incline, 30% platform, 13% hill top, 9% dunes, 7% steep incline, 3% valley bottom.
Aspect (817 records): 45% South, 28% North, 17% West, 9% East.



Soil Type (1340 records): 68% sandy, 22% loamy, 7% rocky, 2% gravelly, 1% clayey.
Soil Colour (1325 records): 44% grey, 36% brown, 6% white, 5% black, 4% red, 3% yellow, 2% orange.
Geology (1389 records): 86% limestone, 7% Tertiary sands, 4% sandstone, 2% shale, 1% silcrete or ferricrete.
Vegetation (1420 records): 97% shrubland, 2% thicket.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 4 004 km^2 with 16% conserved and 25% lost; Occupancy: 1 308 km^2 with 37% conserved and 20% lost. Fragmentation index: 15%.
Nature Reserves (1424 records): 39% in Nature Reserves.
Habitat destruction (1336 records): 84% extensive natural habitat, 11% islands,

2% naturally fragmented habitats, 1% road verges, 1% naturally linear habitats.
Alien Invasive Species (1321 records): 73% Fabaceae (chiefly alien *Acacia*), 25% none.
Alien Density (1318 records): 25% alien-free, 41% sparse, 17% abundant, 13% dense, 3% impenetrable.

Cultivation & Utilization:
Picking (1004 records): 100% no sign of picking, 0.1% lightly picked, 0.1% severely picked.
Cultivation Status: Plantings - 6 records, Escapes - 15 records (1%).

Atlassers Notes:
Must be an escapee - only one seen all on own - identity not a problem - but where did escape from? These odd escapes will prove a problem to determine origin in years to come (AGRY1030721); Some of the plants looked a bit like stressed *L. xanthoconus* (or a hybrid) - they had escaped presumably from trucks (LYM99052009); A single plant was found on subsequent visit but not frequent - in road verge so probably an escape (OUTY0072709); Road verge plants - escaped from flower picking trucks? (SMRY0052401); All plants within 5-6 m of the road - seeded from transported cutflower proteas (SMRY0052410);
Old quarry reseeded with this species! (APE92080330);
Almost all chopped out (OUT99060507);
This the southernmost protea in Africa? (AJT93070201); southermost Proteas? (OGM96022204);
Magic! Plot mostly limestone pavement with round potplant-size holes - colonised by Conebushes! (SMRY1031411);

Confusing Species: Mistaken for *L. xanthoconus* (73% of cases, which has adpressed silvery-sheen (not grey-silver) leaves, and narrower fruit), *modestum* (as young plants only) and *muirii*. (presumably a typological error).
Evaded detection as a new species due to being misidentified as *L. salignum* (1895) and *uliginosum (1912)*, the latter being included in Muirs (1929) species on the Riversdale area.
Records of identification queries = 31.
Records of corrected identification queries = 15.

Variation and Taxonomy: No variation noted.

Distribution: Add.
Southernmost protea
INCLUDEPICTURE "C:\\temp\\atlas\\LDMERI_m.jpg" * MERGEFORMAT \d

Leucadendron xanthoconus (Kuntze) Schum. 1893, 1898
Sickle-leaf Conebush
Blinkblaartolbos

Other Common Names: Emulous Euryspermum, Glossy-leaf Conebush, Goldentips, Sabulosum, Salignum, Silvercones, Yellow Conebush, *Geelbos, Knoppiesbos, Silvertolbos.*

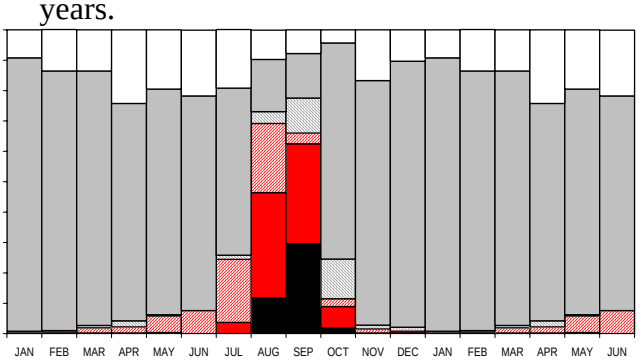
Other Scientific Names: *aemulum* Salisb. ex Knight 1809, *argentea* var *δ* and *γ* (L.) 1753, *conifera* var *δ* and *β* (L.) 1764, *cuspidatum* Klotzsch (ms), *salignum* (Lam.) 1791, *salignum* R.Br. 1810, *salignum* var. *linearifolium* Meisn. 1856, *uliginosum* form *pungens* Gandoger 1901.

7224 Records

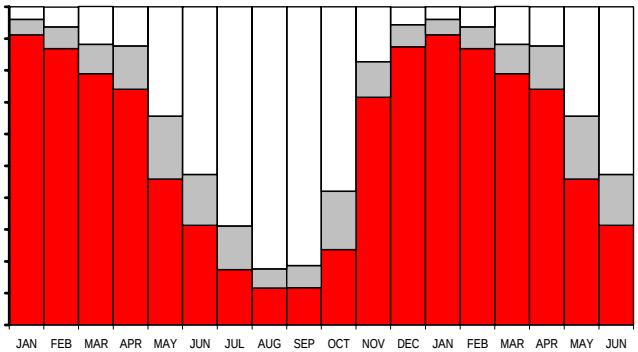
Population (7122 records): 8% Abundant, 55% Common, 31% Frequent, 6% Rare.

Dispersion (6739 records): 78% variable, 13% widespread, 8% clumped, 1% evenly distributed.

Flowering (6998 records with: Jan 629, Feb 647, Mar 593, Apr 591, May 478, Jun 393, Jul 544, Aug 583, Sep 808, Oct 651, Nov 605, Dec 476): Buds from Jul to Aug; Flowering from Aug to Sep; Peak Flowering from Sep; Over not significant; Fruit from Oct to Jul; Nothing from Apr to Jul. Peak levels at 78% in Sep. Historically recorded as flowering in Aug, fruit retained for several years.



Growth (6828 records with: Jan 622, Feb 643, Mar 590, Apr 568, May 471, Jun 374, Jul 517, Aug 568, Sep 776, Oct 634, Nov 596, Dec 469): Much from Oct to Jun; Rare from May; None from May to Oct. Peak levels at 96% in Jan.



Seedlings (2744 records): Absent in 86%: fewer seedlings than prefire adults in 60 cases, and more in 130 cases. Seedlings found in Jan (30), Feb (11), Mar (5), Apr (9), May (13), Jun (15), Jul (23), Aug (18), Sep (24), Oct (16), Nov (11) and Dec (15).

Fire Survival (411 records): 84% survived by seedlings only, 10% eliminated from the area by fires, 5% escaped fires in fire-safe areas.

Age to first flowering: First flowers recorded at 1 year, 50% estimated at 4 years, and 100% recorded at 12 years.

Height (7018 records): 5% 0-0.2 m tall, 62% 0.2-1 m tall, 32% 1-2 m tall, 1% 2-5 m tall.

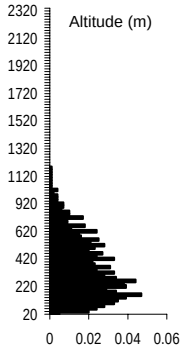
Pollinators (35 records): 74% beetles, 11% flies, 6% birds, 3% bees or wasps, 3% mites, 3% none observed.

Detailed Pollinators (5 records): Monkey Beetle (3), Orange-breasted Sunbird, Great Protea Beetle.

Habitat:

Distance to Ocean (6918 records): 72% inland - further than 2 km from coast.

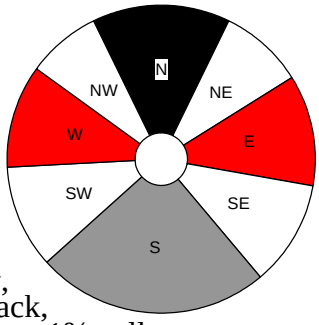
Altitude (6918 records): 20 - 1120 m; 160 *lq* - 300 *med* - 460 *uq* m.



Landform (6764 records): 77% deep soil, 17% shallow soil, 5% rocky outcrops, 1% swamp.

Slope (6755 records): 52% gentle incline, 33% steep incline, 7% platform, 6% hill top, 2% valley bottom.

Aspect (6019 records): 36% South, 23% North, 21% East, 20% West.



Soil Type (6736 records): 67% sandy, 17% loamy, 7% gravelly, 4% clayey, 3% rocky, 3% peaty.

Soil Colour (6718 records): 61% grey, 23% brown, 6% black, 6% white, 2% orange, 1% yellow.

Geology (6692 records): 86% sandstone, 8% shale, 2% silcrete or ferricrete, 1% granite, 1% Tertiary sands.

Vegetation (6885 records): 98% shrubland, 1% plantations.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 4 769 km^2 with 26% conserved and 32% lost; Occupancy: 2 523 km^2 with 29% conserved and 32% lost. Fragmentation index: 24%.
Nature Reserves (6918 records): 58% in Nature Reserves - well conserved.
Habitat destruction (6654 records): 93% extensive natural habitat, 4% islands, 2% road verges, 1% naturally linear habitats.
Alien Invasive Species (6586 records): 39% none, 31% *Pinus*, 20% Fabaceae (chiefly alien *Acacia*), 6% *Hakea*, 3% Myrtaceae.
Alien Density (6576 records): 39% alien-free, 46% sparse, 11% abundant, 3% dense.

Cultivation & Utilization:
Picking (4342 records): 99% no sign of picking, 1% lightly picked, 0.3% severely picked.
Cultivation Status: Plantings - 16 records, Augmentations - 6 records, Escapes - 24 records.

Atlassers Notes:
Variation:
Has some features of *L. coniferum* (AGR92042502); Most have hints of *L. coniferum* (AGRY3090710); Tending very much to features of *L. coniferum* (APE92060711);
Fruit were less than 5 mm broad – confusing! But attributed to this site being on the periphery of the distribution (NGF94100301); Fruit very narrow! (OGM97031503,5,7);
Several plants Have Pinkish Leaves Surrounding Cone (PAP94091403); Odd: *xanthoconus* giss but long thin cones SMR98120909; Quite a bit of variability seen - pale *versus* dark leafed plants - leaves arranged in obvious spiral *versus* not spiralled (WEL94022702);
Height:
All the adult plants 2-3m high were killed by last year's fire (PVR92042201); The adult plants 2-4m high were killed by last year's fire (PVR92042203); 4 m tall (WIJ93121801);
Flowering post fire:
Flowered for 2nd time after fire - age must be about 3 years after widespread fire: zillions of babies (AWA95092701); It is noticeable that four years after the last fire there are still no cones although the young plants are in abundance (PVR94022301); Noticeable that in the 2.5 years in between they have not coned (PVR94022401); Many young - mostly male - flowered already in second season after fire (TLE92100406); Flowered only 1-2 times before fire (TLEY1010209);
Flowering season:
Only has small buds and males are not yet "bright" whereas it is peak flowering at low alt (TLE95091612);
Cones:
Had at least 6 years of cones so perhaps the veld was older than 10 years (NGF94020601); Older cones have shed seeds (TLE97053101);
Regeneration:
Seedlings about 40-50 mm high – still with cotyledons (LYM94102303); Could not find any seedlings on this plot - perhaps the seeds all washed away in the flood (LYM99110602); The seedlings were both first and second season (PVR91091101); No young plants visible possibly because of second fire on devil's peak coming so soon after the first (PVR92070202); One live plant many dead – senescent? (AKS92040203); About 10% senescent (NAH94052201);
Predation:
Vlei Rat eating plants (CRS96092108); Found a worm in a cone (NGF94100301);
Fungus present on about 1/3 of bushes (WEL94103001);
Growth:
Only females with new leaves (AGR91120717); One plant showed unusual new growth emanating from centres of male inflorescences (SHR91092901);
Harvesting:
In a pile of picker's material we found lots of female cones (AGR91120811); Occasional petty picking along lower slopes along road: pickers previously caught with full bundles from the site (MAJ92032001); Area severely picked for cones - many coneless bushes with foliage remain (STU99052501); Picked for cones (STU99052502);
Piles due to bulldozing (CJL98062001);
Mortality:
Half dead (AGR99071802); 1/4 population dead! (AGR99071811); Lots of dead in patches - apparently wetter areas that appear to have dried out (AGRY0011410); All dead! (AGRY0052407, AGRY1012803); Many dead (AKS92040205, AKS93042105); Some dead (AKS93042203); About 1/2 dozen dead mature plants with old cones (CVV95021205); Very stunted on dry slope (JID95090402); About 1/3 of plants have turned brown & died this year - too dry a summer? Too much competition for the scarce water? (PVR95051701); 1/3 already dead (VCH98042903);
Gender:
Males only (AGRY0090820); could only find female plants (MHRY0122203);
Ecology:
In this plot was replaced gradually by *L. gandogeri at* higher altitudes (AGR91120711); Playing *L. salicifolium*'s role in river courses! (AGR96081506); Proteas in clear zones around water – *L. xanthoconus* closest (AGR98060619); Common on lower slopes much sparser higher up (JAT93081203); *L. gandogeri* and *xanthoconus* almost completely mutually exclusive in this area (OGM93022804);
L. coniferum X xanthoconus - just a few hybrid plants - 80% *coniferum* - on upper edge of pure *coniferum* lower down and *xanthoconus* higher up to west (AGRY4082403);
Only along the road (AMM99112902); All plants within 5-6m of the road - seeded from transported cutflowers or dried cones? (SMRY0052410);

Confusing Species: Most commonly confused with *L. coniferum* (32% of cases corrected, a larger, more rounded shrub, with hairless

leaves and broader winged fruit, and redder cones with rounded margin to the cone bracts), *eucalyptifolium* (23%, leaves much longer and hairless), *meridianum* (18%, leaves broader, obtuse and grey-silvery), *salicifolium* (11%, smaller male flowerheads and hairless mature leaves) and *macowanii* (4%, with hairless mature leaves). Less understandably – as these are totally distinct species, also confused with *L. laureolum, rubrum, salignum* and *strobilinum* (6% of cases corrected).

Quite a few records of hybridization and hybrid zones with *L. coniferum* were noted especially on the central Cape Peninsula (Elses Peak, Karbonkelberg).

Records of identification queries = 107.

Records of corrected identification queries = 71.

Variation and Taxonomy: The taxonomy is bedeviled by later synonyms and the earliest valid name, not linked to some other species in the genus, is the 1893 name *xanthoconus*, even though the species had luxuriously been given different names since 1753 (and before).

There is variation, but this is of little significance, restricted to the shape of the mature female heads and the fruit:

- Narrowest fruit, triangular in cross-section: Hermanus and Caledon area;
- Broadest, winged fruit: Potberg and Cape Peninsula.

Is it a coincidence that the narrow fruit occurs where it overlaps in distribution with *L. salicifolium*?

Distribution: Add.

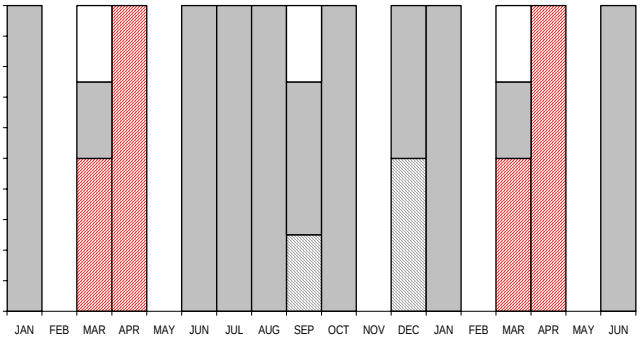
INCLUDEPICTURE "C:\\temp\\atlas\\LDXANT_m.jpg" * MERGEFORMAT \d

Leucadendron cryptocephalum Guthrie 1939
Concealed Conebush

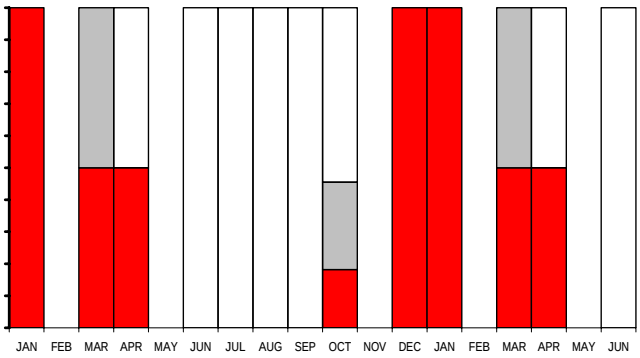
Other Common Names: None known.
Other Scientific Names: None.

36 Records

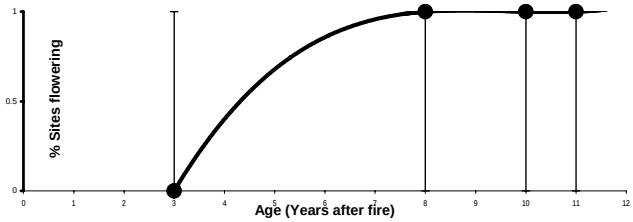
Population (36 records): 28% Common, 56% Frequent, 17% Rare.
Dispersion (34 records): 74% variable, 26% clumped.
Flowering (36 records with: Jan 1, Feb 0, Mar 4, Apr 2, May 0, Jun 1, Jul 2, Aug 9, Sep 4, Oct 11, Nov 0, Dec 2): Buds from Mar to Apr; Flowering and Peak Flowering not recorded; Over from Sep and Dec; Fruit from Jun to Mar; Nothing from Mar and Sep. Peak levels not recorded, probably May. Historically recorded as flowering from late Mar to early May, fruit retained for at least 12 months.



Growth (36 records with: Jan 1, Feb 0, Mar 4, Apr 2, May 0, Jun 1, Jul 2, Aug 9, Sep 4, Oct 11, Nov 0, Dec 2): Much from Dec to Apr; Rare from Mar and Oct; None from Apr to Oct. Peak levels unreliable at 100% in Jan.

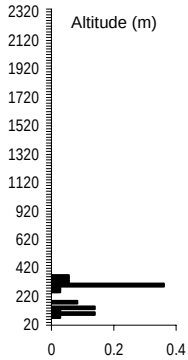


Seedlings (20 records): All without any seedlings present.
Fire Survival (1 record): 100% survived by seedlings only.
Age to first flowering: First flowers recorded at 8 years, 50% estimated at 5-6 years, and 100% recorded at 8 years.

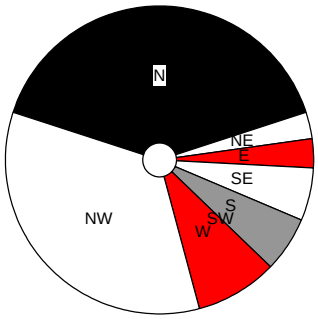


Height (36 records): 3% 0-0.2 m tall, 36% 0.2-1 m tall, 61% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (36 records): 100% inland - further than 2 km from coast.
Altitude (36 records): 60 - 360 m; 120 $_{lq}$ - 180 $_{med}$ - 300 $_{uq}$m.



Landform (36 records): 100% deep soil.
Slope (36 records): 89% gentle incline, 8% platform, 3% hill top.
Aspect (35 records): 61% North, 23% West, 9% South, 7% East.



Soil Type (36 records): 36% clayey, 31% gravelly, 22% loamy, 11% sandy.
Soil Colour (36 records): 44% brown, 33% grey, 11% orange, 6% yellow, 3% white, 3% red.
Geology (34 records): 62% silcrete or ferricrete, 26% shale, 9% sandstone, 3% Tertiary sands.
Vegetation (36 records): 97% shrubland, 3% grassland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered B1a(i)b(i,ii,iii,iv,v)c(iv) + 2a(i)b(i,ii,iii,iv,v)c(iv).
Occurrence (Fynbos): 25 km^2 with 15% conserved and 25% lost; Occupancy: 14 km^2 with 1% conserved and 33% lost. Fragmentation index: 6%.
Nature Reserves (36 records): 0% in Nature Reserves - unconserved.
Habitat destruction (36 records): 53% extensive natural habitat, 39% islands, 8% naturally linear habitats.
Alien Invasive Species (36 records): 44% Fabaceae (chiefly alien *Acacia*), 33% *Pinus*, 11% *Hakea*, 6% Myrtaceae, 6% none.

Alien Density (36 records): 6% alien-free, 83% sparse, 11% abundant.

Cultivation & Utilization:
Picking (28 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
About 30 plants (NAH96030206); 23 plants and 6 dead, 18 plus 7 recruitment (CHE98030501); one male escaped fire no young plants seen despite search (SMRY2090602);
Several dead plants also (SMR99090302);

Confusing Species: Very similar to *L. laureolum* and easily misidentified as such. It is smaller in size, paler in colouring and earlier in flowering. However, it is the very tight involucral leaves which seal off the female flowerheads that are the diagnostic character for this species.
Records of identification queries = 6.

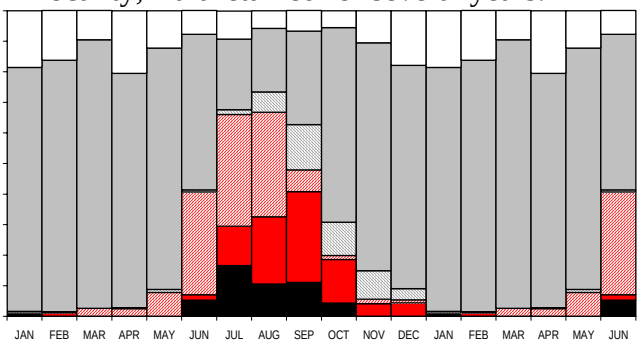
Variation and Taxonomy: No variation noted.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDCRYP_m.jpg" * MERGEFORMAT \d

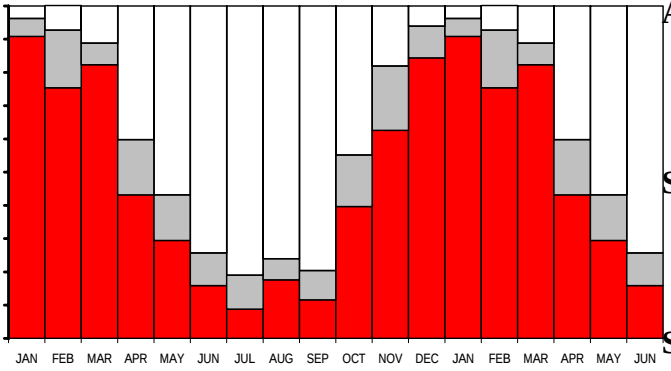
Leucadendron eucalyptifolium Buek ex Meisn. 1856
Gum-leaf Conebush
Grootgeelbos

Other Common Names: Long-leaf Conebush, Sabulosum, Tall Yellowbush, *Albertiniatolbos, Geelbos, Langblaartol.*
Other Scientific Names: *salignum* form *eriocladum* (Gand) 1901, *salignum* var. *longifolium* (Meisn.) 1856.

5072 Records
Population (5032 records): 6% Abundant, 47% Common, 40% Frequent, 7% Rare.
Dispersion (4821 records): 58% variable, 21% clumped, 18% widespread, 3% evenly distributed.
Flowering (4920 records with: Jan 485, Feb 283, Mar 470, Apr 361, May 295, Jun 283, Jul 433, Aug 395, Sep 650, Oct 559, Nov 410, Dec 296): Buds from Jun to Aug; Flowering from Aug to Sep; Peak Flowering and Over not significant; Fruit from all year round; Nothing from Apr. Peak levels at 73% in Aug. Historically recorded as flowering from Jul to Oct depending on locality, fruit retained for several years.

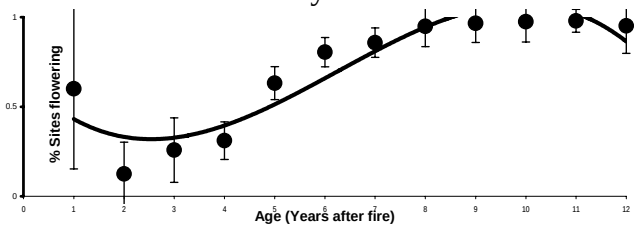


Growth (4859 records with: Jan 479, Feb 284, Mar 474, Apr 361, May 285, Jun 276, Jul 422, Aug 391, Sep 636, Oct 547, Nov 409, Dec 295): Much from Oct to May; Rare not significant; None from Apr to Oct. Peak levels at 96% in Jan.



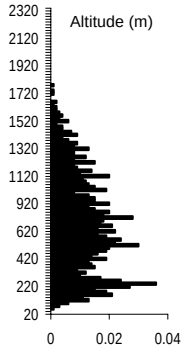
Seedlings (2082 records): Absent in 91%: fewer seedlings than prefire adults in 32 cases, and more in 66 cases. Seedlings found in Jan (5), Feb (8), Mar (7), Apr (9), May (4), Jun (7), Jul (13), Aug (6), Sep (15), Oct (18), Nov (4) and Dec (2).

Fire Survival (244 records): 73% survived by seedlings only, 14% escaped fires in fire-safe areas, 11% eliminated from the area by fires, 2% resprouted from aerial trunks, 1% resprouted from underground boles.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% recorded at 14 years.

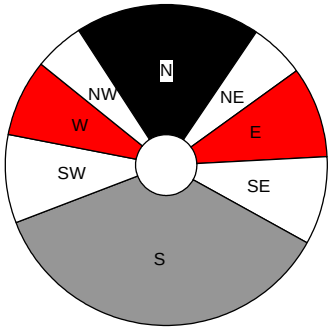


Height (4989 records): 2% 0-0.2 m tall, 21% 0.2-1 m tall, 51% 1-2 m tall, 26% 2-5 m tall, 1% taller than 5 m.
Pollinators (16 records): 56% beetles, 19% mites, 13% birds, 6% flies, 6% none observed.
Detailed Pollinators (2 records): Orange-breasted Sunbird, Monkey Beetle.

Habitat:
Distance to Ocean (4945 records): 96% inland - further than 2 km from coast.
Altitude (4945 records): 20 - 2360 m; 360 *lq* - 640 *med* - 900 *uq* m.



Landform (4926 records): 70% deep soil, 24% shallow soil, 5% rocky outcrops.
Slope (4936 records): 44% steep incline, 38% gentle incline, 8% platform, 6% hill top, 2% valley bottom, 2% cliff.
Aspect (4281 records): 45% South, 24% North, 16% East, 15% West.



Soil Type (4753 records): 44% sandy, 40% loamy, 5% rocky, 4% peaty, 4% gravelly, 3% clayey.
Soil Colour (4733 records): 44% grey, 35% brown, 14% black, 3% yellow, 2% orange, 2% white.
Geology (4807 records): 87% sandstone, 6% shale, 4% Tertiary sands, 2% limestone.
Vegetation (4923 records): 96% shrubland, 2% plantations.

Conservation Status and Threat:
Red Data List Status: Least Concern.

Occurrence (Fynbos): 21 153 km^2 with 29% conserved and 14% lost; Occupancy: 4 059 km^2 with 42% conserved and 13% lost. Fragmentation index: 9%.
Nature Reserves (4945 records): 50% in Nature Reserves.
Habitat destruction (4818 records): 87% extensive natural habitat, 5% islands, 4% road verges, 2% naturally linear habitats.
Alien Invasive Species (4677 records): 48% none, 24% *Pinus*, 15% *Hakea*, 12% Fabaceae (chiefly alien *Acacia*).
Alien Density (4667 records): 48% alien-free, 40% sparse, 8% abundant, 3% dense.

Cultivation & Utilization:
Picking (3471 records): 100% no sign of picking, 0.3% lightly picked, 0.01% severely picked.
Cultivation Status: Plantings - 12 records, Escapes - 2 records.

Atlassers Notes:
Why are the young so small? Drought! (VJK93080803); We noticed 2 or 3 very large plants more than twice the size of the rest and found they are growing in old decomposed ant mounds – don't tell me proteas cant do with a little fertilizer same as one would feed orchids (VJK93041801);
Going to fruit a second time: I think altitude and moisture play a part in maturity - expect seed germinate sooner than on the lower and drier sites (VJK97071802);
Lots of dieback (AGR99090911); Quite a lot dead at edges of seep (AGRY1020106); Over 3/4 of young plants dead! (AGRY2041913); High mortality! (AGRY2042030); Important patches with dead plants (drought) (AMMY0101201); Wide sweep of dieback down centre of valley (OUT99050705); Plants very stressed: lots dead. Driest winter in recorded history – after a very wet summer Dec 1998 (WMPY0110404);
1/10 of previous population (AGRY1070701); 1/100 previous population (AGRY1070702, AGRY1070802); Prefire densities 100 times higher in parts and in other areas 10 times (AGRY1070803); Failed to recruit at this altitude - lots of skeletons (AGRY2041927); Very bad recruitment compared to *Protea* (AGRY3103118); Virtually no reseeding on hilltop from what was once an incredibly dense population (MHGY0070802);
Lots dead due to pine canopy closure – a few survivors (AGRY3103139); Signs of senescence and starting to die (HRK93081803)Somewhat senescent: 4-5 m tall and 20 years old? (MHG96010204)
Some Inter - Fire Recruitment (PMR91120505);
Noticed that a parasite was feeding off the plants and have included a sample of it: *Cassytha* (BHAY0100801);
Wind and sea spray has a major influence of plants, with those on the cliffs wider than they are tall (HRK96032902);
Tops of foliage "cut" - almost pruned - insects? (VCH99090802);
Remarkable mono-culture and very dense on this lower slope of peak (DFJ96121503); So dense the fire was not able to penetrate (VJK97051501);
A Curious Little Stand Of This Species On The Road Verge Amid Forest (AGR93022701); Persists on verge of forestry road through plantation (AKS93091607); Struggling Remnants Grown Inside Fringe Of Pine Plantation (NOG93080102); Confined To Open Road Margin (SGAY0121402);

Confusing Species: A distinctive species not easily confused with other species. A few hiccups included: *L. tradouwense* (based on wishful identification of seedlings), *modestum* (!), *muirii, coriaceum, pubescens, pubibracteolatum* and *radiatum*. Understandable mistakes included: *L xanthoconus, salicifolium, conicum, meridianum,* and *spissifolium*, but all of these have much shorter leaves. In the herbarium it is most easily confused with *L. coniferum* (which has a pointed, rather than blunt mucro).
Records of identification queries = 82.
Records of corrected identification queries = 36.

Variation and Taxonomy: A relatively constant species with no noted variation. However, the Rooiberg variant (*cf*) was not recognized until well into the project.

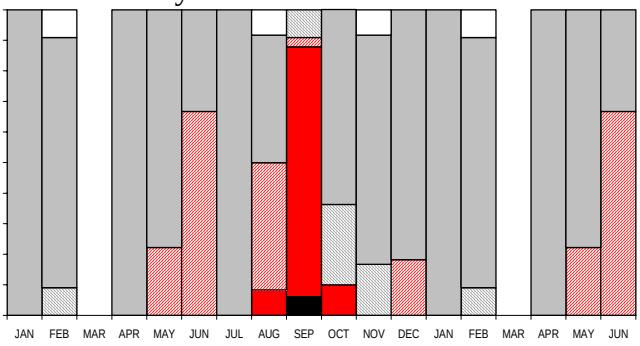
Distribution: Add.
The record Rogers 27367 from Grahamstown in 1928 is suspicious and might be of planted plants.
INCLUDEPICTURE "C:\\temp\\atlas\\LDEUCA_m.jpg" * MERGEFORMAT \d

Leucadendron eucalyptifolium Rooiberg form
Rooiberg Conebush

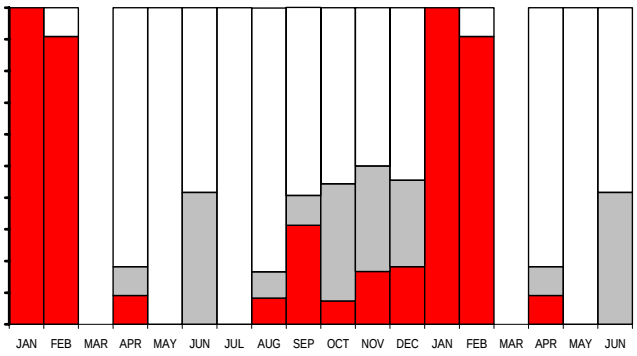
Other Common Names: None known.
Other Scientific Names: *None.*

206 Records

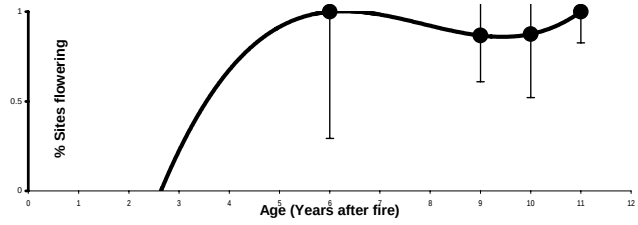
Population (205 records): 5% Abundant, 41% Common, 47% Frequent, 6% Rare.
Dispersion (197 records): 54% variable, 24% clumped, 16% widespread, 5% evenly distributed.
Flowering (204 records with: Jan 7, Feb 11, Mar 0, Apr 11, May 9, Jun 12, Jul 6, Aug 12, Sep 33, Oct 80, Nov 12, Dec 11): Buds from May to Jun and Aug; Flowering from Sep; Peak Flowering not significant; Over from Oct; Fruit from Oct to Aug; Nothing not significant. Peak levels at 100% in Sep. Historically not recorded.



Growth (204 records with: Jan 7, Feb 11, Mar 0, Apr 11, May 9, Jun 12, Jul 6, Aug 12, Sep 32, Oct 81, Nov 12, Dec 11): Much from Jan to Feb and Sep; Rare from Jun and Oct to Dec; None from Apr to Dec. Peak levels at 100% in Jan.

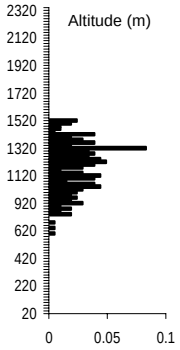


Seedlings (28 records): All without any seedlings present.
Fire Survival : No data.
Age to first flowering: First flowers recorded at 100% at 6 years, no data from younger veld.

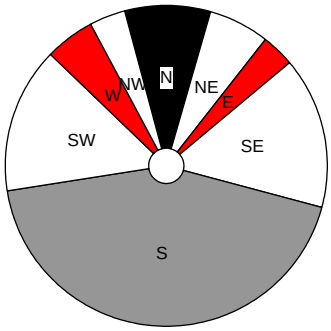


Height (205 records): 8% 0.2-1 m tall, 66% 1-2 m tall, 26% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (206 records): 100% inland - further than 2 km from coast.
Altitude (206 records): 580 - 1420 m; 920 *lq* - 1080 *med* - 1200 *uq*m.



Landform (206 records): 81% shallow soil, 19% deep soil.
Slope (206 records): 73% steep incline, 15% gentle incline, 10% hill top, 1% cliff.
Aspect (189 records): 59% South, 14% West, 13% North, 13% East.



Soil Type (206 records): 56% sandy, 31% loamy, 7% gravelly, 6% rocky.
Soil Colour (206 records): 50% brown, 40% grey, 7% black, 2% orange.
Geology (206 records): 100% sandstone.
Vegetation (206 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 295 km^2 with 53% conserved and 0% lost; Occupancy: 157 km^2 with 52% conserved and 0% lost. Fragmentation index: 40%.
Nature Reserves (206 records): 55% in Nature Reserves - well conserved.
Habitat destruction (206 records): 100% extensive natural habitat.
Alien Invasive Species (205 records): 96% none, 4% *Hakea*.
Alien Density (205 records): 96% alien-free, 4% sparse.

Cultivation & Utilization:
Picking (171 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes: None.

Confusing Species: This was usually identified as *L. eucalyptifolium* (outside of flowering this would be the logical conclusion), with a single record of *L. conicum* (the logical error for a male plant during flowering).
Records of identification queries = 204.

Records of corrected identification queries = 204.

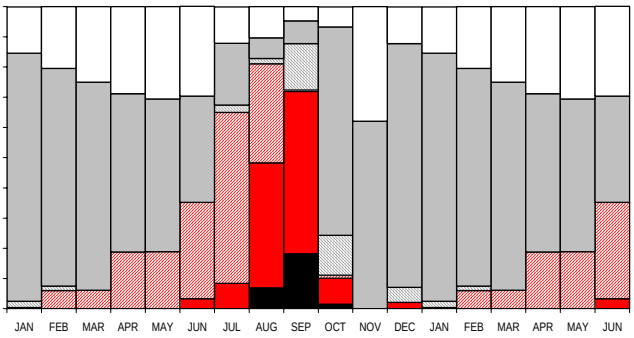
Variation and Taxonomy: No known variation.
This species differs from *L. eucalyptifolium* in that the males have flowerheads typical of *L. conicum*.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDEUCAR_m.jpg" * MERGEFORMAT \d

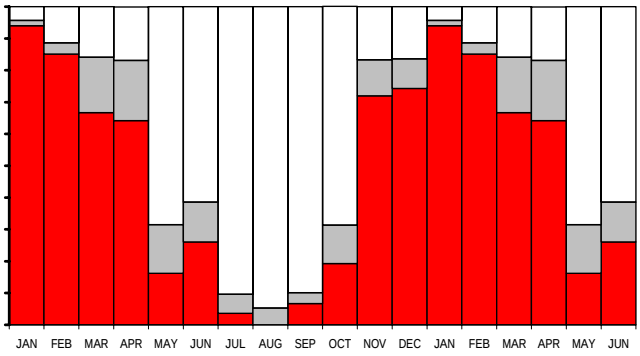
Leucadendron gandogeri Schinz ex Gand. 1913
Broad-leaf Conebush
Berggeelbos

Other Common Names: Decorum, Glabrum, Golden Glory Conebush, Mountain Conebush, Tumbleweed, *Spring Gold.*
Other Scientific Names: *decorum* form *marcrolepis* Gand. 1901, *decorum* var. *zeyherianum* Meisn. 1856, *guthrieae* Salter *1943.*

1871 Records
Population (1842 records): 3% Abundant, 50% Common, 37% Frequent, 11% Rare.
Dispersion (1702 records): 81% variable, 9% clumped, 9% widespread.
Flowering (1822 records with: Jan 235, Feb 201, Mar 132, Apr 191, May 111, Jun 91, Jul 83, Aug 58, Sep 214, Oct 197, Nov 169, Dec 140): Buds from Jun to Aug; Flowering from Aug to Sep; Peak Flowering from Sep; Over not significant; Fruit from Oct to Jul; Nothing from Feb to Jun and Nov. Peak levels at 88% in Sep. Historically recorded as flowering from late Aug to Sep, fruit retained.

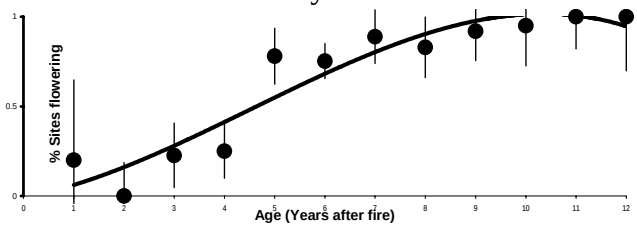


Growth (1803 records with: Jan 233, Feb 201, Mar 132, Apr 190, May 111, Jun 88, Jul 83, Aug 57, Sep 208, Oct 192, Nov 168, Dec 140): Much from Nov to Apr and Jun; Rare from Apr; None from May to Oct. Peak levels at 96% in Jan.



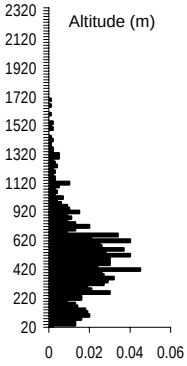
Seedlings (892 records): Absent in 92%: fewer seedlings than prefire adults in 9 cases, and more in 28 cases. Seedlings found in Jan (12), Feb (2), Mar, May (5), Jun (3), Jul (2), Aug, Sep (9) and Nov (2).
Fire Survival (115 records): 86% survived by seedlings only, 10% eliminated from the area by fires, 3% escaped fires in fire-safe areas.

Age to first flowering: First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% recorded at 12 years.

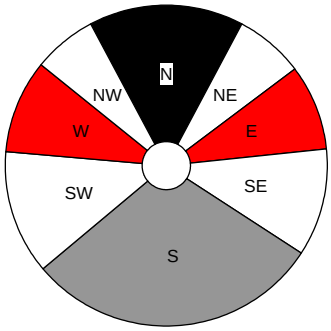


Height (1824 records): 4% 0-0.2 m tall, 71% 0.2-1 m tall, 23% 1-2 m tall.
Pollinators (12 records): 50% beetles, 17% bees or wasps, 17% flies, 17% none observed.
Detailed Pollinators (5 records): Honey Bee (2), Great Protea Beetle (2), Scarab Beetle.

Habitat:
Distance to Ocean (1805 records): 82% inland - further than 2 km from coast.
Altitude (1805 records): 20 - 1600 m; 300 *lq* - 460 *med* - 600 *uq*m.



Landform (1770 records): 74% deep soil, 21% shallow soil, 3% rocky outcrops, 1% swamp.
Slope (1771 records): 44% gentle incline, 42% steep incline, 9% hill top, 4% platform, 1% cliff.
Aspect (1597 records): 42% South, 22% North, 19% West, 17% East.



Soil Type (1763 records): 55% sandy, 19% loamy, 13% peaty, 6% gravelly, 5% rocky, 1% clayey.
Soil Colour (1762 records): 62% grey, 19% black, 12% brown, 5% white.
Geology (1757 records): 96% sandstone, 3% shale.
Vegetation (1801 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 2 707 km^2 with 18% conserved and 32% lost; Occupancy: 973 km^2 with 34% conserved and 14% lost. Fragmentation index: 24%.

Nature Reserves (1805 records): 52% in Nature Reserves - well conserved.
Habitat destruction (1752 records): 98% extensive natural habitat, 1% naturally linear habitats.
Alien Invasive Species (1735 records): 55% none, 30% *Pinus*, 7% *Hakea*, 6% Fabaceae (chiefly alien *Acacia*), 1% Myrtaceae.
Alien Density (1734 records): 55% alien-free, 39% sparse, 5% abundant.

Cultivation & Utilization:
Picking (1268 records): 98% no sign of picking, 1% lightly picked, 0.4% severely picked.
Cultivation Status: Plantings - 12 records, Escapes - 4 records).
Witch's Broom Infestation: 1 record (0.05%).

Atlassers Notes:
Something eating fruit out of cones – baboons or rodents? (AGR95040104); Cones pared open by baboons or even rodents (APE92060705); Much evidence of chopped down plants by Vlei Rat *Otomys Irroratus* (JID96092109);
Etiolated and chlorotic - growing under a gum plantation (NGF96070602);
The cold here has obviously restricted the growth and they have not even set seed and cones yet (PVR98020701);
Only females picked (AGR91120808);
Ratio of males to females 10:1 - due to picking related mortality (AGR91120808);
One dead plant (APE92060606);
Leucadendron xanthoconus replaced gradually by *L. gandogeri* which dominated most of the higher altitude area and steeper slopes (AGR91120711); *Leucadendron xanthoconus* and *gandogeri* almost completely mutually exclusive in this area (OGM93022802, OGM93022805); More abundant as an altitude increased (PAT95092305);
Road verge plants - escaped from flower picking trucks? (SMRY0052401);

Confusing Species: Regularly confused with *L. laureolum*, especially populations with more closed cones – a few populations with features of *L. laureolum* (slightly curved inner involucral bracts and clasping involucral leaves, for example on the plains at Hermanus) confused the situation. Less frequently (6% of cases) confused with *L. microcephalum*, when not in flower (but is a taller plant, with asymmetrical fruit and large-brown involucral bracts). Odd careless errors with *L. meridianum* and *L. tinctum*.
Records of identification queries = 156.
Records of corrected identification queries = 82.

Variation and Taxonomy: There is variation in this species – some of it may be due to hybridization with associated species:
- Larger leaves at Bettys Bay;
- Large leaves, conspicuous long basal bracts, very large cones and rough fruit on the western end of Groenlandberg;
- Broad, elliptic, red leaves: higher altitudes of the Hottentots Holland;
- Slightly keeled involucral leaves and large cones at Hermanus at lower altitudes.

Distribution: Add.
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Leucadendron laureolum (Lam.) Fourcade 1792, 1934
Golden Sunshinebush
Louriertolbos

Other Common Names: Broad Goldtips, Comely Euryspermum, Decorum, Decorum Star, Golden Conebush, Laural-leaf Conebush, Yellow Tulip Conebush, *Geelbos, Inca Gold.*

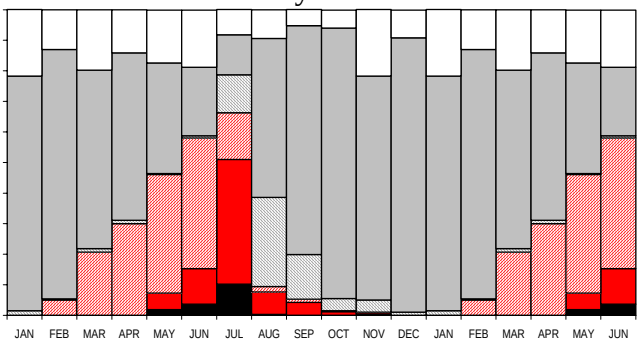
Other Scientific Names: *ciliata* (Thunb.) 1806, *decorum* R.Br. 1810, *decorum* (Salisb) 1796, *decorum* var. *dregeanum* Meisn. 1856, *strobilina* (Lam) 1804, *venosa* (Thunb.) 1803, *venulosa* (Steud.) 1841.

3544 Records

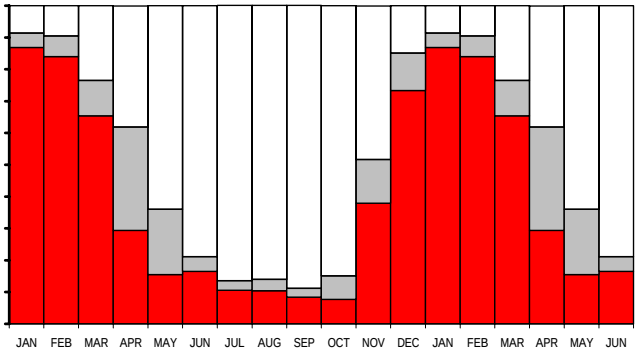
Population (3427 records): 2% Abundant, 49% Common, 40% Frequent, 9% Rare.

Dispersion (3248 records): 73% variable, 14% widespread, 12% clumped.

Flowering (3467 records with: Jan 271, Feb 261, Mar 363, Apr 263, May 312, Jun 241, Jul 314, Aug 342, Sep 378, Oct 323, Nov 202, Dec 197): Buds from Mar to Jun; Flowering from Jul; Peak Flowering not significant; Over from Aug; Fruit from Aug to Jun; Nothing from Jan, Mar and Nov. Peak levels at 79% in Jul. Historically recorded as flowering from Jun, fruit retained for several years.



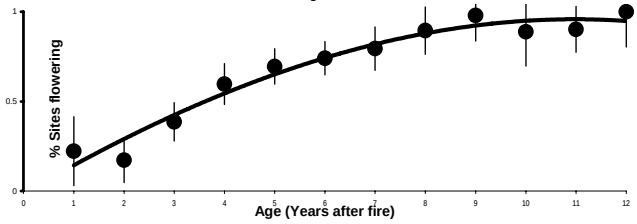
Growth (3358 records with: Jan 268, Feb 263, Mar 370, Apr 255, May 283, Jun 218, Jul 303, Aug 338, Sep 359, Oct 311, Nov 195, Dec 195): Much from Nov to Apr; Rare from Apr to May; None from Mar to Nov. Peak levels at 91% in Jan.



Seedlings (1217 records): Absent in 81%: fewer seedlings than prefire adults in 65 cases, and more in 52 cases. Seedlings found in Jan (12), Feb (16), Mar (5), Apr (3), May (13), Jun (11), Jul (17), Aug (20), Sep (8), Oct (6) and Nov (6).

Fire Survival (278 records): 83% survived by seedlings only, 10% escaped fires in fire-safe areas, 5% eliminated from the area by fires, 2% resprouted from underground boles.

Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 12 years.



Height (3499 records): 5% 0-0.2 m tall, 45% 0.2-1 m tall, 46% 1-2 m tall, 4% 2-5 m tall.

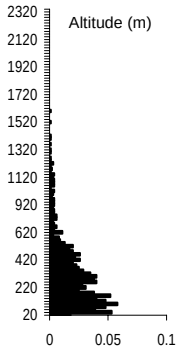
Pollinators (15 records): 60% beetles, 20% bees or wasps, 13% flies, 7% birds.

Detailed Pollinators (5 records): Honey Bee (2), Orange-breasted Sunbird, Great Protea Beetle, Conebush Beetle.

Habitat:

Distance to Ocean (3392 records): 62% inland - further than 2 km from coast.

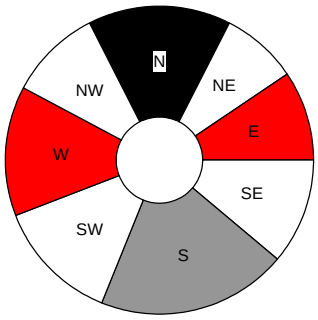
Altitude (3397 records): 20 - 1500 m; 100 *lq* - 240 *med* - 360 *uq*m.



Landform (3375 records): 76% deep soil, 16% shallow soil, 7% rocky outcrops, 1% swamp.

Slope (3360 records): 55% gentle incline, 21% steep incline, 15% platform, 5% hill top, 3% valley bottom.

Aspect (2776 records): 32% South, 25% West, 24% North, 18% East.



Soil Type (3372 records): 80% sandy, 10% loamy, 5% gravelly, 2% rocky, 2% clayey.

Soil Colour (3358 records): 65% grey, 18% brown, 11% white, 3% black, 2% orange.

Geology (3317 records): 90% sandstone, 4% shale, 2% limestone, 2% Tertiary sands, 1% silcrete or ferricrete.

Vegetation (3384 records): 98% shrubland, 1 plantations.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 6 741 km^2 with 29% conserved and 29% lost; Occupancy: 1 201 km^2 with 48% conserved and 16% lost. Fragmentation index: 8%.
Nature Reserves (3397 records): 72% in Nature Reserves - well conserved.
Habitat destruction (3318 records): 95% extensive natural habitat, 2% islands, 2% naturally linear habitats.
Alien Invasive Species (3249 records): 44% none, 26% Fabaceae (chiefly alien *Acacia*), 24% *Pinus*, 4% *Hakea*, 1% Myrtaceae.
Alien Density (3242 records): 44% alien-free, 44% sparse, 9% abundant, 2% dense.

Cultivation & Utilization:
Picking (2213 records): 99% no sign of picking, 0.8% lightly picked, 0.2% severely picked.
Cultivation Status: Plantings - 67 records (2%), Augmentations - 1 record, Escapes - 23 records (0.6%).

Atlassers Notes:
Huge Cones: 55mm Across (AGRY4050110);
Something Has Been Eating Seeds From The Cones Systematically – a Rodent? (APE92051003); Worm Eaten Cones (KJO98080803); A Caterpillar Was Eating One Of The Cones (LYM99042102); A Few Plants Had Survived The Last Fire But Their Flowers Have Been Largely Damaged By Insects (NGF95091601);
Some Recruitment Seen In Slightly Eroded Gulley Despite Some Plant Cover (AGRY0041601); No Dead Bushes Seen - Seeds Must Have Blown In (CVV95052102);
Most Cones Had Opened - The Plants Looked Moribund (NGFY2010509, 11);
2 Dead (AGR99092906); 1 Dead Plant Seen (AGRY0122101); A Few Large Dead Bushes With Old Cones - No Other Dead Protea Bushes (CVV95082001); Dead (CVV96052602); Many Seedlings Dead On Account Of Drought (and Other Plants Too) (WIJY0111904);
Female Next To Road Very Large Bush With Very Few Cones No Pollinators Male Within Easy Range? (AKS96060801); One Live Big Female (CVVY0102202); Only 1 Found (FBH95071501);
2 Orange Breasted Sunbirds On The plants While We Were Present - Not For Pollination No Doubt (FBH95080501); Ants On Cones (FBH95091001); PO Ants on flowerheads (IKA92072401);

Confusing Species: Most often confused with *L. gandogeri* (53% of corrected cases) and *strobilinum* (19%) – both of which do not have shallow grooves on the cones, and have flat involucral leaves. Less frequently confused with *L. coniferum* (9% - with much narrower leaves), *microcephalum* (6% - very similar vegetatively, but with brown basal bracts), *cryptocephalum* (4% - very similar, but a smaller plant, paler and with tighter involucral bracts), and odd cases of *spissifolium* and *linifolium*. Superficially similar plants in the Sun Conebushes were never mistaken for this species, presumably because of its serotinous cones.
Records of identification queries = 124.
Records of corrected identification queries = 68.

Variation and Taxonomy: A constant species without any variation.

Distribution: Add.
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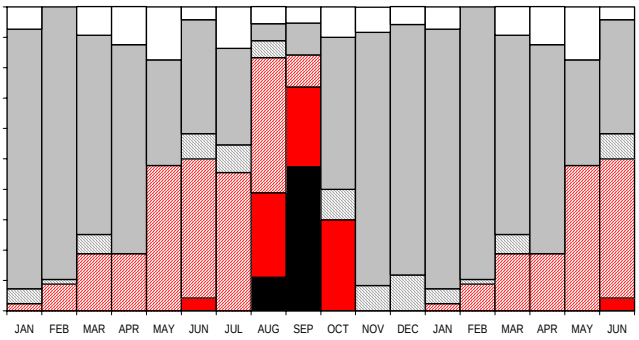
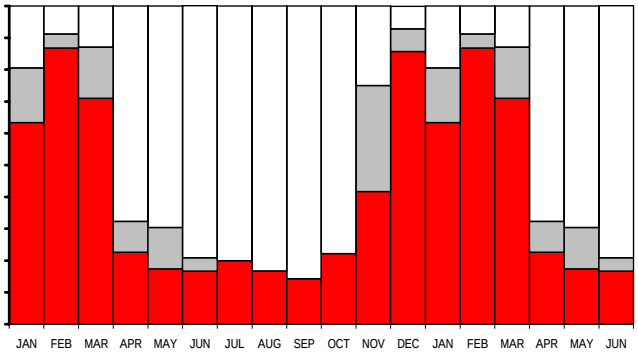
Leucadendron strobilinum (L.) Druce 1771, 1917
Peninsula Conebush
Rotstolbos

Other Common Names: Mountain Rose, Rock Conebush, Strobiled Protea, *Bergroos.*
Other Scientific Names: *arcuata* var. *β* Lam 1791, *ciliata* Desf 1815, *concolor* R.Br. 1810, *obliqua* var. *β* Lam 1804, *saxatile* Salter 1943, *squarrosum* R.Br. 1810.

327 Records
Population (322 records): 26% Common, 49% Frequent, 24% Rare.
Dispersion (285 records): 72% variable, 19% clumped, 8% widespread, 2% evenly distributed.
Flowering (318 records with: Jan 41, Feb 68, Mar 32, Apr 32, May 23, Jun 24, Jul 22, Aug 18, Sep 19, Oct 10, Nov 12, Dec 17): Buds from May to Aug; Flowering from Aug to Oct; Peak Flowering from Sep; Over not significant; Fruit from Oct to Jul; Nothing not significant. Peak levels at 89% in Aug. Historically recorded as flowering from Sep to Oct



Growth (305 records with: Jan 41, Feb 68, Mar 31, Apr 31, May 23, Jun 24, Jul 20, Aug 18, Sep 14, Oct 9, Nov 12, Dec 14): Much from Oct to Apr and Jul; Rare from Nov; None from Jan and Apr to Nov. Peak levels at 93% in Dec and 91% in Feb.

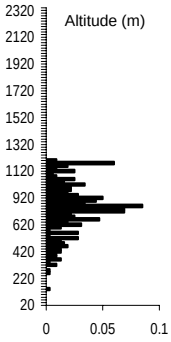


Seedlings (77 records): Absent in 84% <6~8% missing 8%>: fewer seedlings than prefire adults in 4 cases, and more in 2 cases. Seedlings found in Jan, Feb, Mar (2), Apr and Jul.
Fire Survival (13 records): 38% survived by seedlings only, 31% eliminated from the area by fires, 31% escaped fires in fire-safe areas.

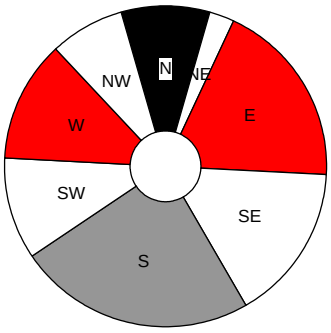
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% consistently recorded after 5 years, with some evidence of senescence after 21 years.

Height (323 records): 29% 0.2-1 m tall, 58% 1-2 m tall, 12% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (315 records): 70% inland - further than 2 km from coast.
Altitude (315 records): 120 - 1100 m; 640 *lq* - 740 *med* - 800 *uq* m.



Landform (314 records): 55% deep soil, 35% shallow soil, 10% rocky outcrops.
Slope (314 records): 43% steep incline, 34% gentle incline, 13% hill top, 5% cliff, 4% platform.
Aspect (258 records): 36% South, 28% East, 22% West, 14% North.



Soil Type (314 records): 78% sandy, 9% loamy, 9% rocky, 2% peaty, 2% gravelly.
Soil Colour (312 records): 73% grey, 15% brown, 8% black, 3% white.
Geology (314 records): 97% sandstone, 2% shale.
Vegetation (313 records): 97% shrubland, 2% thicket.

Conservation Status and Threat:
Red Data List Status: Near Threatened D2(ii).
Occurrence (Fynbos): 154 km^2 with 50% conserved and 43% lost; Occupancy: 71 km^2 with 79% conserved and 15% lost. Fragmentation index: 44%.
Nature Reserves (315 records): 99% in Nature Reserves - well conserved.

Habitat destruction (311 records):
96% extensive natural habitat, 2% naturally linear habitats, 1% islands.
Alien Invasive Species (309 records):
48% *Pinus*, 46% none, 6% Fabaceae (chiefly alien *Acacia*).
Alien Density (309 records): 46% alien-free, 53% sparse, 2% abundant.

Cultivation & Utilization:
Picking (146 records): 99% no sign of picking, 1% lightly picked.
Cultivation Status: Plantings - 4 records (1%).
Witch's Broom Infestation: 1 record (0.3%).

Atlassers Notes:
One plant in forest is height code 5 (greater than 5 m tall) but is half dead - most on cliffs are smaller (AKS93042904); Very old bushes with heavy thick trunks (DJL94120503); 3 remarkably large male plants 3x6 m with trunks 300 mm diam. Female plants much smaller. These plants must be a record for this species being in such undisturbed fynbos which alas is going to be burnt within the next year (EGH92010801);
Protected from the recent fire by rocks (PVR97082708);
3 plants all healthy (2 Males 1 Female) (NAH92050902);
Galls on stems near leaves (WIJ96072103);
Beetles on buds (eating?) (NAH92050902);

Confusing Species: Illustrated as *L. grandiflorum* by Edwards in 1814. Confused with *L. laureolum* (with yellow keeled involucral leaves and ridged cones) and *L. gandogeri* (which does not occur naturally on the Peninsula)
Records of identification queries = 19.
Records of corrected identification queries = 8.

Variation and Taxonomy: Salter noted that the plants in exposed high slopes had cones and leaves half the size of those in more sheltered positions. Atlassers noted no variation, other than that older plants were taller.

Distribution: Add.
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Leucadendron spissifolium subspecies *spissifolium* (Salisb. ex Kn.) William 1809, 1967

Common Spear-leaf Conebush

Vleigeelbos

Other Common Names: Crowded-leaf Euryspermum, Goldtips Conebush, Shiney-cone Conebush, Volute-leaf Euryspermum, *Blinktolbos, Geelperdebos, Knopbos, Knopiesgeelbos, Kraaltolbos, Perdebos, Riviertolbos, Tolletjies, Vleigeelbos, Watertolbos , Corringle Gold.*

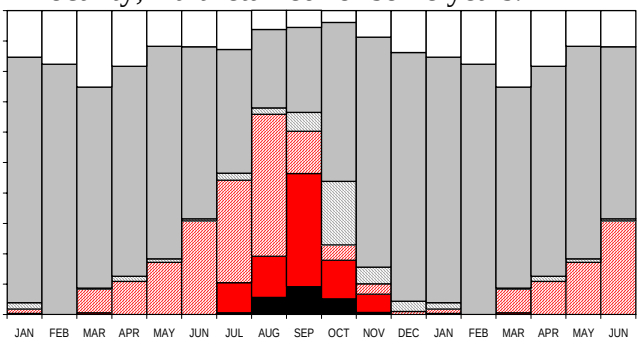
Other Scientific Names: *adscendens* var. *pallens* Phill & Hutch 1912, *beukianum* Meisn. 1856, *glabrum* R.Br. 1810, *glabrum* var. *angustifolium* Meisn 1856, *marginata* (Willd.) 1813, *minus* Phill & Hutch 1912, *minus var. glabrescens* Phil.l & Hutch. 1912, *riparium* Salter 1943, *riparium* var. *collinum* Salter 1943, *riparium* var. *pillansii* Salter 1943, *volutifolium* (Salisb. ex Kn.) 1809.

3445 Records

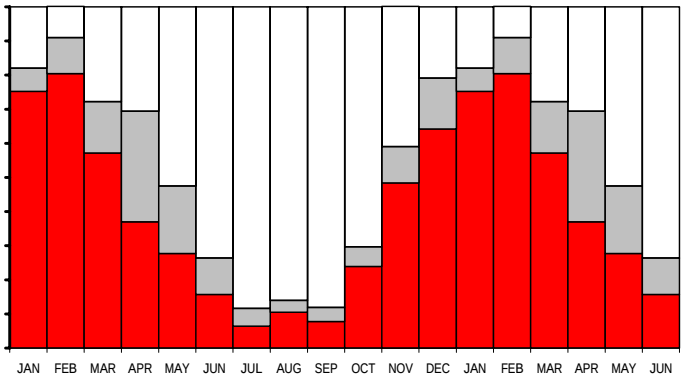
Population (3421 records): 23% Common, 60% Frequent, 17% Rare.

Dispersion (3153 records): 72% variable, 24% clumped, 3% widespread.

Flowering (3409 records with: Jan 281, Feb 267, Mar 357, Apr 175, May 180, Jun 143, Jul 172, Aug 287, Sep 468, Oct 440, Nov 436, Dec 203): Buds from Jun to Aug; Flowering from Sep; Peak Flowering not significant; Over from Oct; Fruit from all year round; Nothing from Mar. Peak levels at 68% in Aug. Historically recorded as flowering from Aug to Oct depending on locality, fruit retained for some years.



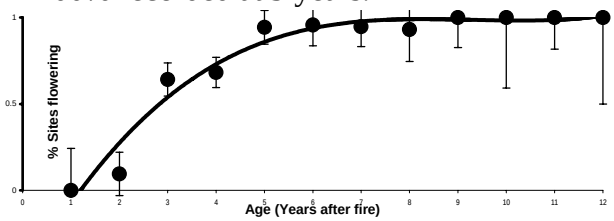
Growth (3375 records with: Jan 278, Feb 265, Mar 353, Apr 173, May 177, Jun 140, Jul 173, Aug 286, Sep 462, Oct 431, Nov 436, Dec 201): Much from Oct to May; Rare from Apr to May; None from Mar to Dec. Peak levels at 91% in Feb.



Seedlings (1534 records): Absent in 96%: fewer seedlings than prefire adults in 23 cases, and more in 5 cases. Seedlings found in Jan (5), Mar (4), Apr (2), May, Jun (2) and Nov (14).

Fire Survival (328 records): 96% resprouted from underground boles, 3% escaped fires in fire-safe areas, 1% survived by seedlings only.

Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% recorded at 9 years.



Height (3416 records): 2% 0-0.2 m tall, 87% 0.2-1 m tall, 11% 1-2 m tall.

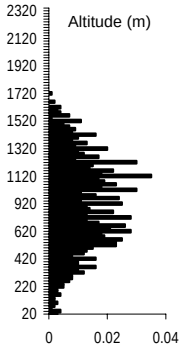
Pollinators (36 records): 75% beetles, 22% flies, 3% birds.

Detailed Pollinators (12 records): Monkey Beetle (10), Great Protea Beetle (2).

Habitat:

Distance to Ocean (3343 records): 98% inland - further than 2 km from coast.

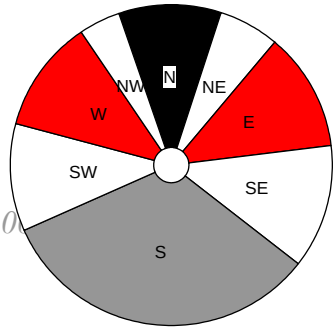
Altitude (3344 records): 20 - 1680 m; 540 *lq* - 800 *med* - 1020 *uq*m.



Landform (3334 records): 73% deep soil, 22% shallow soil, 3% rocky outcrops.

Slope (3335 records): 51% steep incline, 37% gentle incline, 5% hill top, 3% platform, 2% cliff, 1% valley bottom.

Aspect (3101 records):



45% South, 21% East, 19% West, 15% North.

Soil Type (3316 records): 40% sandy, 31% loamy, 10% gravelly, 7% rocky, 6% peaty, 6% clayey.
Soil Colour (3299 records): 41% brown, 41% grey, 11% black, 3% orange, 2% white, 1% yellow.
Geology (3279 records): 75% sandstone, 17% shale, 6% granite, 2% silcrete or ferricrete.
Vegetation (3338 records): 97% shrubland, 1% plantations, 1% grassland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 20 198 km^2 with 19% conserved and 20% lost; Occupancy: 2 525 km^2 with 46% conserved and 11% lost. Fragmentation index: 6%.
Nature Reserves (3344 records): 56% in Nature Reserves - well conserved.
Habitat destruction (3300 records): 95% extensive natural habitat, 2% islands, 2% naturally linear habitats.
Alien Invasive Species (3264 records): 41% none, 37% *Pinus*, 16% *Hakea*, 5% Fabaceae (chiefly alien *Acacia*).
Alien Density (3258 records): 41% alien-free, 49% sparse, 7% abundant, 2% dense.

Cultivation & Utilization:
Picking (2316 records): 100% no sign of picking, 0.1% lightly picked.
Cultivation Status: Plantings - 2 records.

Atlassers Notes:
Amazingly tall: over 3m tall in 2 year old veld! (AGR93071811); Unusual tall form as seen near Maraisberg and Pakhuispass (AMMY3112622, 23); Unusual and tall form like on Grootberg (AMMY3112718); Long and straggly (CJL98061602); 2 m tall - have christened them subspecies robusta (VJK93053002); Very tall - nearly 2 m (VJK93082201); Tallest I ever have seen (VJK99092407);
Male plants with very small leaves (AGR92021302);
Silvery peach leaves (AGRY2031206); A very pretty silver form! (AGRY2041916); Silver form (AGRY2041924, AGRY2042013, 16); Bud and old leaves silvery (GYC92070504); Silver hairs on leaves (SHR98112901-03);
New leaves incredibly hairy = 'furry' (AGR96032911);
Looked like *L. gandogeri* except resprouting (APE92081617);
In bud and flowering later than those in Tradouw Pass (VJK93082201); Flowering late here (VJK93091901);
Male flowerheads "smelly" (WMPY1111704);
Hairy-pollinator: beetle 5mm long (AGRY4092604); Also pollinated by Longhorn Beetles (LYM97091004); Both types of heads covered in ants (WEL95030501);
Several had single stems - old veld (WIJ95031109);
Replaces *L. salignum* up slope (AGR92021301);
Only males (AGR96121103; AGR97121329); Only females (AGR99071808); My lonely hearts protea: 1 female and 5 small males clustered together yet common on map (AWA96100901);
Very stressed (WMPY0110408);

Confusing Species: The commonest problem (29% of corrected queries, over half of all queries) was a reluctance to identify subspecies, even when these were obvious. The most common misidentification was with *L. spissifolium* subsp. *fragrans* (47% of corrected queries; this has much narrower leaves), part of the problem was an error in the field guide regarding leaf sizes). Very few cases of misidentification with *L. salignum* (with silvery hairy, not smooth red/brown cones) were noted. Confusion with the following non-resprouters was noted: *diemontianum* (3%), *elimense* (1%), *glaberrimum* (1%), *laureolum* (3%), *strobilinum* (1%), *tinctum* (3%). A single case of confusion with *L. arcuatum* was noted (different seeds, not serotinous).
Records of identification queries = 133.
Records of corrected identification queries = 59.

Variation and Taxonomy: Williams found it impossible to divide this subspecies into smaller taxa. There are numerous ecotypes, but no geographically distinct forms. He furthermore states (italics quoted from Williams 1972): Salter (1943) "*thought he could*" discern 3 taxa (varieties) on the Cape Peninsula. Phillips and Hutchingson (1912) "*envisaged*" 3 taxa (2 species and one variety) from the Caledon Division. He did note the following variation, but did not formally recognize it with a name:

- Thin adpressed pubescence on upper branches and leaves: Piketberg and Clanwilliam;
- Linear oblong leaves with new branches and leaves villous: Langeberg near Riversdale;
- Large and small leaved populations and sometimes intermediate populations, may occur on the same mountain.

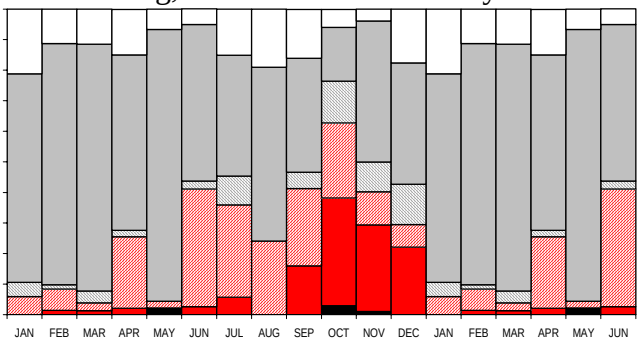
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSPISS_m.jpg" * MERGEFORMAT \d

Leucadendron spissifolium subspecies *fragrans* Williams 1972
Fragrant Spear-leaf Conebush

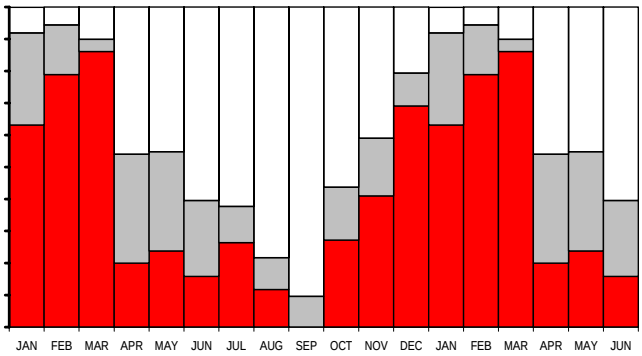
Other Common Names: None known.
Other Scientific Names: *None.*

846 Records

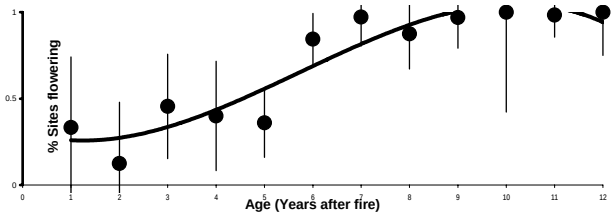
Population (844 records): 18% Common, 65% Frequent, 16% Rare.
Dispersion (774 records): 61% variable, 22% clumped, 12% widespread, 5% evenly distributed.
Flowering (823 records with: Jan 85, Feb 71, Mar 78, Apr 47, May 45, Jun 39, Jul 53, Aug 58, Sep 75, Oct 102, Nov 102, Dec 68): Buds from Apr and Jun to Oct; Flowering from Oct to Dec; Peak Flowering and Over not significant; Fruit from Nov to Sep; Nothing from Jan. Peak levels at 76% in Oct. Historically recorded as flowering from Sep in the coastal ranges and Nov on the Swartberg, fruit retained for some years.



Growth (824 records with: Jan 87, Feb 71, Mar 79, Apr 50, May 42, Jun 38, Jul 53, Aug 60, Sep 73, Oct 103, Nov 100, Dec 68): Much from Oct to May and Jul; Rare from Jan and Apr to Jun; None from Apr to Dec. Peak levels at 94% in Feb.

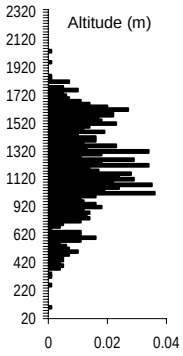


Seedlings (339 records): Absent in 92%: fewer seedlings than prefire adults in 6 cases, and more in 8 cases. Seedlings found in Jan, Feb, Mar, Jul (10) and Sep.
Fire Survival (56 records): 79% resprouted from underground boles, 9% survived by seedlings only, 7% resprouted from aerial trunks, 4% escaped fires in fire-safe areas, 2% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 5-6 years, and 100% recorded at 10 years, with signs of senescence after 20 years.

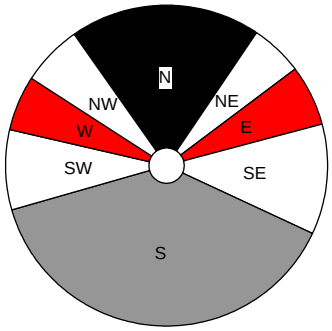


Height (840 records): 7% 0-0.2 m tall, 83% 0.2-1 m tall, 10% 1-2 m tall, 0.8% 2-5 m tall.
Pollinators (16 records): 69% beetles, 25% flies, 6% none observed.
Detailed Pollinators (1 record): Green Beetle.

Habitat:
Distance to Ocean (830 records): 100% inland - further than 2 km from coast.
Altitude (830 records): 80 - 1940 m; 880 *lq* - 1080 *med* - 1320 *uq* m.



Landform (825 records): 55% deep soil, 39% shallow soil, 5% rocky outcrops.
Slope (828 records): 53% steep incline, 35% gentle incline, 7% hill top, 2% platform, 2% cliff.
Aspect (759 records): 49% South, 26% North, 13% East, 12% West.



Soil Type (825 records): 38% loamy, 31% sandy, 10% rocky, 9% peaty, 9% gravelly, 4% clayey.
Soil Colour (823 records): 41% grey, 32% brown, 25% black, 1% orange.
Geology (825 records): 96% sandstone, 4% shale.
Vegetation (827 records): 96% shrubland, 2% grassland, 1% wooded grassland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 10 475 km^2 with 33% conserved and 12% lost; Occupancy: 783 km^2 with 47% conserved and 6% lost. Fragmentation index: 4%.
Nature Reserves (830 records): 58% in Nature Reserves - well conserved.
Habitat destruction (803 records): 97% extensive natural habitat, 2% islands.
Alien Invasive Species (780 records): 65% none, 21% *Pinus*, 12% *Hakea*, 1% Fabaceae (chiefly alien *Acacia*).
Alien Density (773 records): 66% alien-free, 29% sparse, 3% abundant, 2% dense.

Cultivation & Utilization:
Picking (532 records): 100% no sign of picking, 0.4% lightly picked.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Thin and tall - not bushy (OBK96040714);
About 5% plants females and 95% males (DOA92102309);
Remarkable to find healthy conebush growing in dense pine plantation (DFJ97083003);

Confusing Species: By far the most confusion was with neighbouring subspecies. Thus subspecies *spissifolium* (which much broader rounded leaves) accounted for 49% of corrected queries, *phillipsii* (with linear oblanceolate – not subcanaliculate leaves and oval – not lanceolate acute basal bracts) for 21%, and a reluctance to identify subspecies for 24%. A single case of confusion with *L. salignum* (a resprouter with broader leaves and hairy cones) and *teretifolium* (a non-resprouter, with very different cones) was also noted.
Records of identification queries = 124.
Records of corrected identification queries = 84.

Variation and Taxonomy: No variation noted.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSPISF_m.jpg" * MERGEFORMAT \d

Leucadendron spissifolium subspecies *natalense* (Thode & Gilg.) Williams 1913, 1972

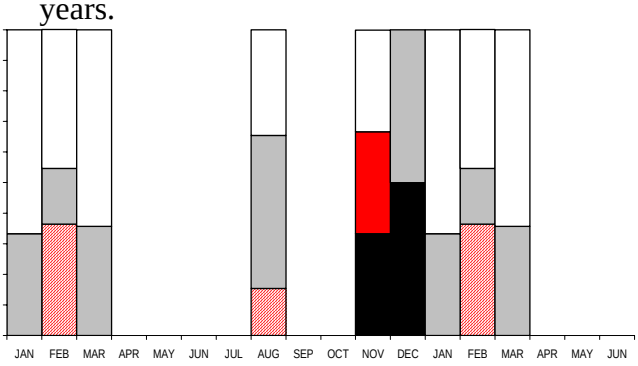
Natal Spear-leaf Conebush

Natalgeelbos

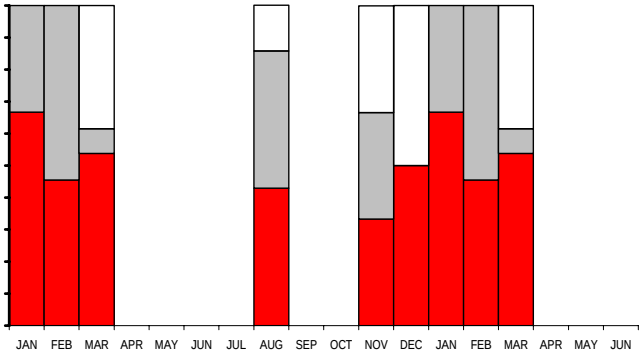
Other Common Names: Pondo Spear-leaf Conebush.
Other Scientific Names: None.

64 Records

Population (63 records): 2% Abundant, 41% Common, 48% Frequent, 10% Rare.
Dispersion (62 records): 50% variable, 32% clumped, 15% widespread, 3% evenly distributed.
Flowering (59 records with: Jan 3, Feb 11, Mar 14, Apr 0, May 0, Jun 0, Jul 0, Aug 26, Sep 0, Oct 0, Nov 3, Dec 2): Buds from Feb; Flowering from Nov; Peak Flowering from Nov to Dec; Over not recorded; Fruit from Dec to Jan and Mar to Aug; Nothing from Jan to Nov. Peak levels unreliable at 67% in Nov. Historically recorded as flowering from Sep to Nov, fruit retained for several years.



Growth (60 records with: Jan 3, Feb 11, Mar 13, Apr 0, May 0, Jun 0, Jul 0, Aug 28, Sep 0, Oct 0, Nov 3, Dec 2): Much from all year round; Rare from Jan to Feb and Aug to Nov; None from Mar and Nov to Dec. Peak levels unreliable at 100% from Jan to Feb.

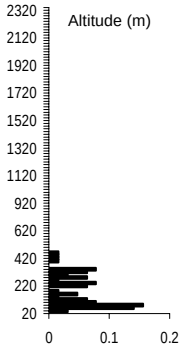


Seedlings (30 records): Absent in 93%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jan.
Fire Survival (39 records): 95% resprouted from underground boles, 3% survived by seedlings only, 3% resprouted from aerial trunks.

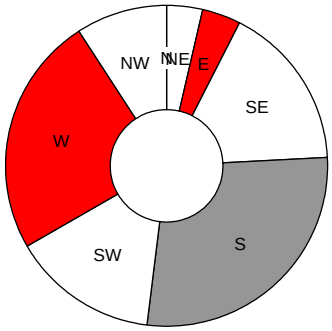
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 1 year, and 100% recorded at 4 years.

Height (61 records): 21% 0-0.2 m tall, 77% 0.2-1 m tall, 2% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (64 records): 52% inland - further than 2 km from coast.
Altitude (64 records): 20 - 460 m; 60 $_{lq}$ - 100 $_{med}$ - 160 $_{uq}$m.



Landform (64 records): 64% deep soil, 14% riverine, 14% shallow soil, 6% rocky outcrops, 2% swamp.
Slope (63 records): 54% gentle incline, 16% steep incline, 16% platform, 10% valley bottom, 5% hill top.
Aspect (54 records): 44% South, 37% West, 13% East, 6% North.



Soil Type (63 records): 46% sandy, 43% loamy, 6% peaty, 3% clayey, 2% rocky.
Soil Colour (63 records): 56% grey, 32% brown, 13% black.
Geology (64 records): 94% sandstone, 6% Tertiary sands.
Vegetation (63 records): 76% grassland, 16% shrubland, 8% wooded grassland.

Conservation Status and Threat:
Red Data List Status: Near Threatened B2a(ii)b(i,ii,iii,iv,v).
Occurrence: 1 784 km^2 with 6% conserved and 9% lost; Occupancy: 85 km^2 with 42% conserved and 10% lost. Fragmentation index: 5%.

Nature Reserves (64 records): 81% in Nature Reserves - well conserved.
Habitat destruction (56 records): 68% extensive natural habitat, 18% naturally linear habitats, 5% islands, 4% corridors, 4% naturally fragmented habitats, 2% patches.
Alien Invasive Species (56 records): 79% none, 11% Fabaceae (chiefly alien *Acacia*), 5% Myrtaceae, 4% *Hakea*, 2% other aliens.
Alien Density (56 records): 79% alien-free, 20% sparse, 2% abundant.

Cultivation & Utilization:
Picking (44 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
This population is undoubtedly this subspecies, but far larger in cone and leaf size than populations to the north: It probably deserves subspecies status (AGR99082711);

Confusing Species: None noted.
Records of identification queries = 1.

Variation and Taxonomy: No variation noted.

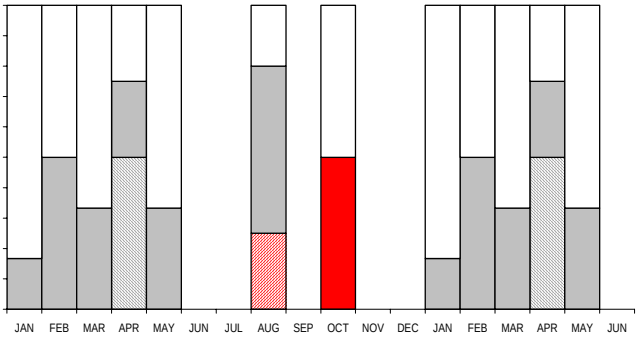
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSPISN_m.jpg" * MERGEFORMAT \d

Leucadendron spissifolium subspecies *oribinum* Williams 1972
Oribi Spear-leaf Conebush
Oribigeelbos

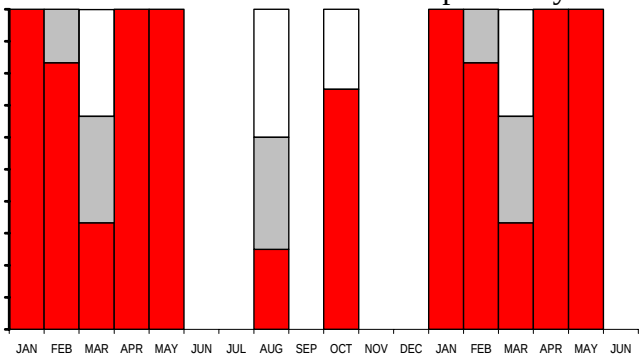
Other Common Names: None known.
Other Scientific Names: None.

51 Records

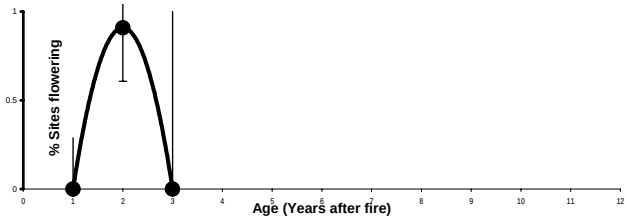
Population (51 records): 29% Common, 59% Frequent, 12% Rare.
Dispersion (49 records): 53% variable, 37% clumped, 8% widespread, 2% evenly distributed.
Flowering (50 records with: Jan 6, Feb 6, Mar 3, Apr 8, May 3, Jun 0, Jul 0, Aug 20, Sep 0, Oct 4, Nov 0, Dec 0): Buds from Aug; Flowering from Oct; Peak Flowering not recorded; Over from Apr; Fruit from Feb to Aug; Nothing from all year round. Peak levels unreliable at 50% in Oct. Historically recorded as flowering from Oct to Nov, fruit retained.



Growth (50 records with: Jan 6, Feb 6, Mar 3, Apr 8, May 3, Jun 0, Jul 0, Aug 20, Sep 0, Oct 4, Nov 0, Dec 0): Much from all year round; Rare from Mar and Aug; None from Mar and Aug to Oct. Peak levels unreliable at 100% from Jan to Feb and Apr to May.

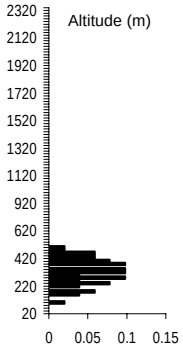


Seedlings (36 records): Absent in 94%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jan.
Fire Survival (44 records): 100% resprouted from underground boles.
Age to first flowering: First flowers recorded at 2 years, 50% estimated at 2-3 years, and 100% not recorded – oldest veld recorded was 3 years.



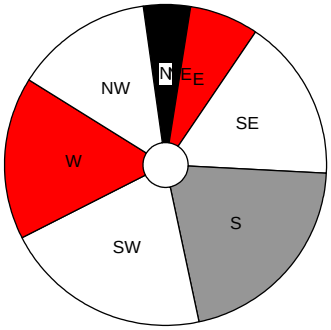
Height (51 records): 12% 0-0.2 m tall, 86% 0.2-1 m tall, 2% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (51 records): 98% inland - further than 2 km from coast.
Altitude (51 records): 80 - 500 m; 240 *lq* - 320 *med* - 380 *uq* m.



Landform (51 records): 47% deep soil, 45% shallow soil, 4% rocky outcrops, 2% riverine, 2% swamp.
Slope (51 records): 53% gentle incline, 33% steep incline, 12% hill top, 2% cliff.
Aspect (43 records): 40% South, 34% West, 14% East, 13% North.

Soil Type (50 records): 70% sandy, 30% loamy.
Soil Colour (50 records): 68% grey, 24% brown, 8% black.
Geology (51 records):



100% sandstone.
Vegetation (50 records): 94% grassland, 6% wooded grassland.

Conservation Status and Threat:
Red Data List Status: Vulnerable B1a(ii)b(i,ii,iii,iv,v).
Occurrence: 715 km² with 12% conserved and 30% lost; Occupancy: 74 km² with 35% conserved and 17% lost. Fragmentation index: 10%.
Nature Reserves (51 records): 61% in Nature Reserves - well conserved.
Habitat destruction (29 records): 93% extensive natural habitat, 7% islands.
Alien Invasive Species (35 records): 83% none, 14% Fabaceae (chiefly alien *Acacia*), 3% *Hakea*.

Alien Density (35 records): 83% alien-free, 17% sparse.

Cultivation & Utilization:
Picking (39 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Few old cones present (NSC95012105);
At low densities (ATA92013001);
2 young plants (VCH99082601);
Young plants present - indicating robust population (ATA99042701);

Confusing Species: None noted, one case of subspecies not entered.
Records of identification queries = 2.
Records of corrected identification queries = 1.

Variation and Taxonomy: No variation noted.

Distribution: Add.
Williams states known from only 2 locations.
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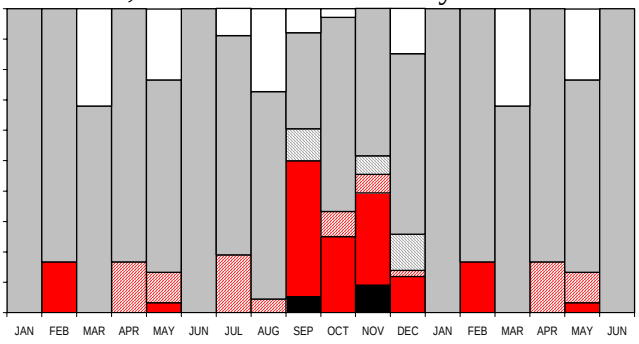
MERGEFORMAT \d

Leucadendron spissifolium subspecies *phillipsii* (Hutchinson) Williams 1912, 1972
Kareedouwvlakte Spear-leaf Conebush

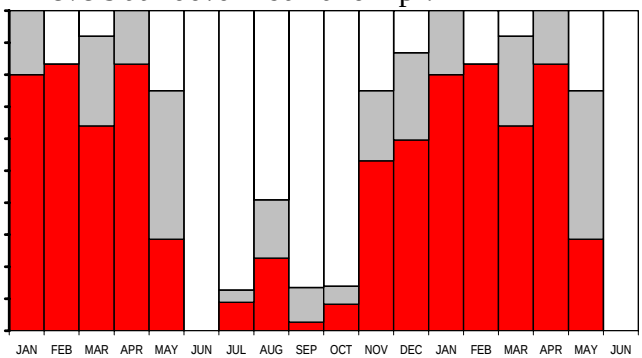
Other Common Names: None known.
Other Scientific Names: *gnidioides* Gand. & Schinz 1913, *virgatum* form *gnidioides* Gand. 1901.

405 Records

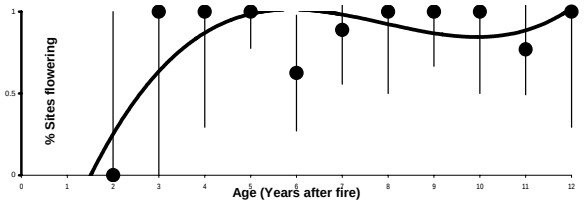
Population (398 records): 33% Common, 59% Frequent, 7% Rare.
Dispersion (378 records): 79% variable, 13% clumped, 6% widespread, 2% evenly distributed.
Flowering (395 records with: Jan 10, Feb 6, Mar 25, Apr 6, May 30, Jun 9, Jul 79, Aug 22, Sep 38, Oct 36, Nov 33, Dec 101): Buds not significant; Flowering from Sep to Nov; Peak Flowering and Over not significant; Fruit from all year round; Nothing from Mar, May and Aug. Peak levels at 61% in Sep. Historically recorded as flowering from Oct to Nov, fruit retained for some years.



Growth (389 records with: Jan 10, Feb 6, Mar 25, Apr 6, May 28, Jun 9, Jul 79, Aug 22, Sep 37, Oct 36, Nov 32, Dec 99): Much from Nov to May and Aug; Rare from Nov to Jan, Mar and May; None from May to Nov. Peak levels at 100% in Jan and Apr.

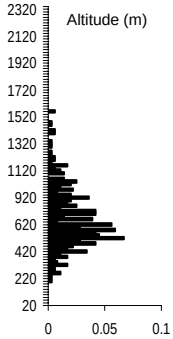


Seedlings (224 records): Absent in 99%: fewer seedlings than prefire adults in 1 case. Seedlings found in Feb.
Fire Survival (20 records): 90% resprouted from underground boles, 10% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 3 years, 50% estimated at 3-4 years, and 100% recorded after 5 years and consistently after 8 years.



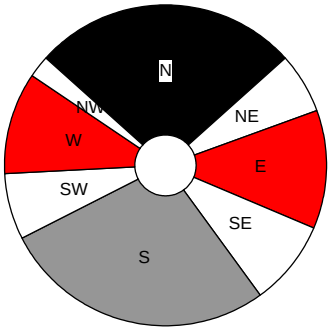
Height (400 records): 2% 0-0.2 m tall, 88% 0.2-1 m tall, 10% 1-2 m tall.
Pollinators (8 records): 88% beetles, 13% flies.
Detailed Pollinators (4 records): Scarab Beetle (2), Great Protea Beetle (2).

Habitat:



Distance to Ocean (358 records): 100% inland - further than 2 km from coast.
Altitude (358 records): 180 - 1460 m; 500 $_{lq}$ - 580 $_{med}$ - 700 $_{uq}$m.

Landform (355 records): 85% deep soil, 12% shallow soil, 3% rocky outcrops.
Slope (358 records): 48% gentle incline, 35% steep incline, 13% hill top, 2% platform, 1% valley bottom.
Aspect (308 records): 37% South, 31% North, 18% East, 15% West.



Soil Type (353 records): 63% loamy, 23% sandy, 7% clayey, 4% peaty, 3% gravelly, 1% rocky.
Soil Colour (352 records): 47% brown, 42% grey, 8% black, 1% red.
Geology (352 records): 92% sandstone, 6% shale, 1% granite.
Vegetation (355 records): 93% shrubland, 5% plantations, 2% grassland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 6 829 km^2 with 39% conserved and 10% lost; Occupancy: 371 km^2 with 43% conserved and 16% lost. Fragmentation index: 3%.
Nature Reserves (358 records): 31% in Nature Reserves.
Habitat destruction (343 records): 78% extensive natural habitat, 20% islands.
Alien Invasive Species (349 records): 52% *Pinus*, 18% *Hakea*, 17% none, 11% Fabaceae (chiefly alien *Acacia*), 2% Myrtaceae.
Alien Density (348 records): 17% alien-free, 54% sparse, 24% abundant, 5% dense.

Cultivation & Utilization:
Picking (284 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.
Witch's Broom Infestation: 1 record (0.2%).

Atlassers Notes:
Some in excess of 2 m growing alongside jeep track (NOG93052303);
Flowerheads also with a crab spider with a caught fly (AGRY0121210); Beetles moving from plant to plant and feeding on pollen (DFJ97092201);

Confusing Species: Most commonly confused (76% of corrected queries) with subspecies *fragrans* (which has narrower leaves and hairy young leaves). The remaining queries were due to atlassers not noting the subspecies.
Records of identification queries = 76.
Records of corrected identification queries = 52.

Variation and Taxonomy:
In 1814 Burchell noted that his specimen was a small tree 3 m tall. Williams notes that the population below is a distinct ecotype, but does not formally name it:
- Leaves broader and thicker: Van Stadensberg.

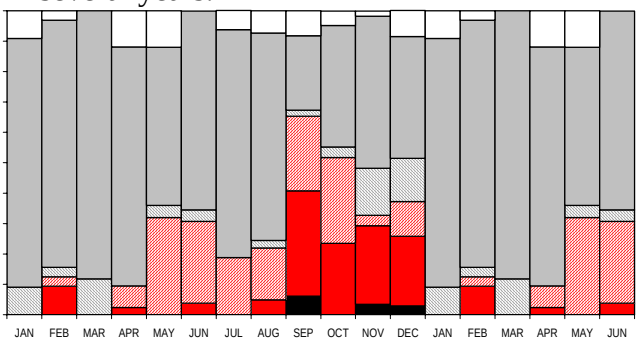
Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDSPISP_m.jpg" * MERGEFORMAT \d

Leucadendron comosum subspecies *comosum* (Thunb.) R.Br. 1781, 1810
Common Ridge-cone Conebush

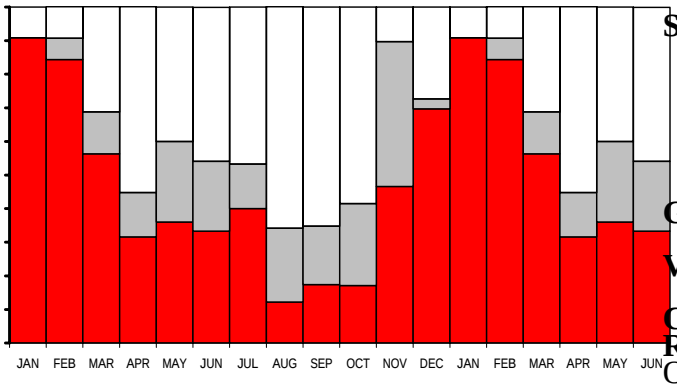
Other Common Names: Candelabra Conebush, Ramentaceous Chasme, Tufted Chasme, *Geelbos, Kraaltolbos.*
Other Scientific Names: *aemulum* R.Br. 1810, *deasii* Phill 1917, *incurva* (Haw ex Andr) 1805, *ramentaceae* (Salisb. ex Knight) 1809.

450 Records

Population (441 records): 24% Common, 57% Frequent, 16% Rare, 1% Extinct.
Dispersion (411 records): 47% clumped, 42% variable, 7% evenly distributed, 4% widespread.
Flowering (437 records with: Jan 11, Feb 32, Mar 17, Apr 42, May 25, Jun 26, Jul 16, Aug 41, Sep 49, Oct 85, Nov 58, Dec 35): Buds from May to Jun and Sep to Oct; Flowering from Sep to Dec; Peak Flowering and Over not significant; Fruit from all year round; Nothing not significant. Peak levels at 67% in Sep. Historically recorded as flowering from late Oct to Nov, fruit retained for several years.

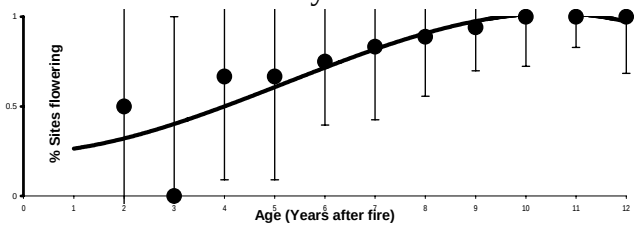


Growth (421 records with: Jan 11, Feb 32, Mar 16, Apr 38, May 25, Jun 24, Jul 15, Aug 41, Sep 46, Oct 82, Nov 58, Dec 33): Much from Nov to Jul; Rare from May to Jun, Aug and Oct to Nov; None from Mar to Oct and Dec. Peak levels at 91% from Jan to Feb.



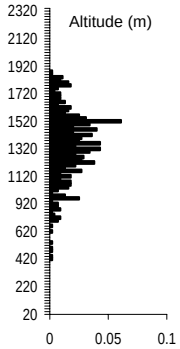
Seedlings (159 records): Absent in 91%: fewer seedlings than prefire adults in 2 cases, and more in 5 cases. Seedlings found in Jan, Apr (2), May, Jul and Dec (2).
Fire Survival (24 records): 42% survived by seedlings only, 33% eliminated from the area by fires, 25% escaped fires in fire-safe areas.

Age to first flowering: First flowers recorded at 2 years, 50% estimated at 4-5 years, and 100% recorded at 10 years.

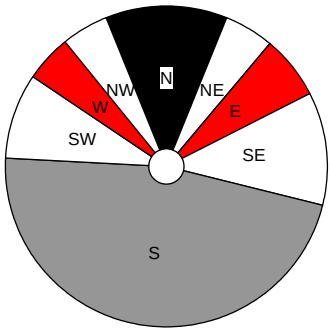


Height (437 records): 2% 0-0.2 m tall, 43% 0.2-1 m tall, 48% 1-2 m tall, 7% 2-5 m tall.
Pollinators (7 records): 86% beetles, 14% flies.
Detailed Pollinators (1 record): Great Protea Beetle.

Habitat:
Distance to Ocean (442 records): 100% inland - further than 2 km from coast.
Altitude (442 records): 420 - 1780 m; 1080 *lq* - 1260 *med* - 1400 *uq* m.



Landform (441 records): 66% shallow soil, 27% deep soil, 7% rocky outcrops.
Slope (441 records): 63% steep incline, 25% gentle incline, 9% hill top, 2% cliff.
Aspect (405 records): 58% South, 17% North, 14% East, 11% West.



Soil Type (440 records): 52% sandy, 23% loamy, 20% rocky, 4% gravelly.
Soil Colour (438 records): 45% grey, 39% brown, 11% black, 3% orange, 2% yellow.
Geology (441 records): 98% sandstone, 2% shale.
Vegetation (441 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 10 676 km^2 with 37% conserved and 5% lost; Occupancy: 529 km^2 with 60% conserved and 3% lost. Fragmentation index: 2%.
Nature Reserves (442 records): 62% in Nature Reserves - well conserved.
Habitat destruction (424 records): 96% extensive natural habitat, 2% islands, 1% naturally linear habitats, 1% naturally fragmented habitats.

Alien Invasive Species (419 records): 86% none, 6% *Hakea*, 5% *Pinus*, 2% Fabaceae (chiefly alien *Acacia*).
Alien Density (412 records): 88% alien-free, 11% sparse.

Cultivation & Utilization:
Picking (336 records): 99% no sign of picking, 0.9% lightly picked, 0.6% severely picked.
Cultivation Status: Plantings - 5 records (1%).

Atlassers Notes:
Distinct isolated patch never seen here before: leaves more needle-like than in field guides slide photograph taken in case need (DFJ95120303); An extremely fine leaved example: specimen: Y Van Wijk 2235 (OUTY0021409); Female cone length of 70 mm, diam of 45 mm, leaves 24 x 1.5 mm 150 mm below cone changing gradually to involucral leaves 40 x 4 mm – a narrow-leaf form of subspecies *comosum* (SMR99080707);
Initially no leaves except new growth! (AWA95061802);
One male only seen (AGR99080710); 10 plants seen - both sexes (DFJ95120303); Small patch of 14 plants in single isolated patch very healthy! (DFJ96110301); One female found lying dead after previous fire but no seedlings could be found (DOA93042803); Only one elderly female plant seen (OGM94011201);
Distribution in veld is only half the area compared to where it was in the previous fire cycle - mainly upslope survival (AGRY2120109); All dead (10-100 plants) (AGRY2120112); Large % of plants dead in area (AMA92112401); Die Back (OUT99100206);
Williams (1972) stated that it may be extinct on Robinson Pass - I have checked it up and it is still there (SHS93070201);
At higher altitude than books say! (AWA99052004);

Confusing Species: The narrow-leaf form was often identified as subspecies *homaeophyllum* (which as needle-like leaves, not narrow flattened leaves). One instance of confusion with *L. osbornei,* which has much smoother cones.
Records of identification queries = 21.
Records of corrected identification queries = 7.

Variation and Taxonomy: Williams states that it does not vary significantly, but atlassers note that some populations lack the broad adult leaves, and involucral leaves.

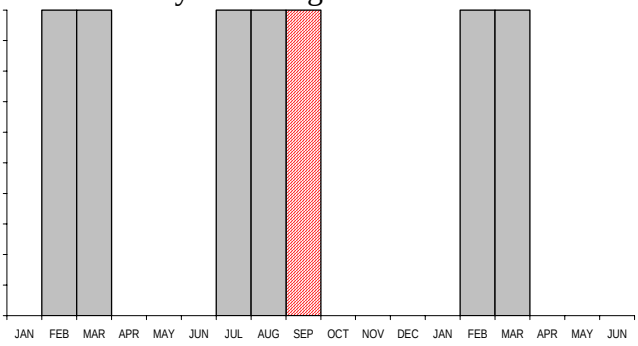
Distribution: Add.
Williams (1972) attributes its apparent extinction at Garcias Pass and Robinson Pass to its slow growth rate. It has however, been relocated at the latter locality.
INCLUDEPICTURE "C:\\temp\\atlas\\LDCOMOC_m.jpg" * MERGEFORMAT \d

Leucadendron comosum subspecies *homaeophyllum* (Meisn.) Williams 1856, 1972
Villiersdorp Ridge-cone Conebush

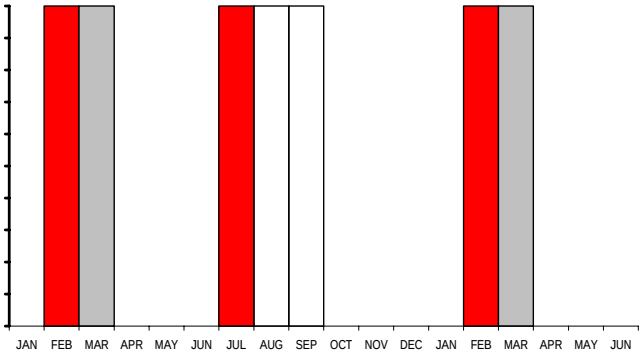
Other Common Names: Pine-leaf Chasme.
Other Scientific Names: *aemulum* var. *homaeophyllum* Meisn. 1856, *pinifolia* Salisb. ex Knight 1809.

7 Records

Population (7 records): 100% Frequent.
Dispersion (7 records): 86% clumped, 14% variable.
Flowering (7 records with: Jan 0, Feb 2, Mar 1, Apr 0, May 0, Jun 0, Jul 1, Aug 1, Sep 2, Oct 0, Nov 0, Dec 0): Buds from Sep; Flowering, Peak Flowering and Over not recorded; Fruit from Feb to Aug; Nothing not recorded. Peak levels unreliable at 100% in Sep. Historically flowering season is not recorded.



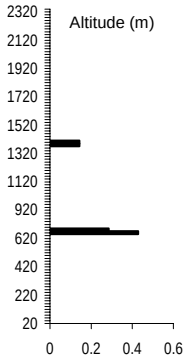
Growth (7 records with: Jan 0, Feb 2, Mar 1, Apr 0, May 0, Jun 0, Jul 1, Aug 1, Sep 2, Oct 0, Nov 0, Dec 0): Much from Feb and Jul; Rare from Mar; None from Aug to Sep. Peak levels unreliable at 100% in Feb and Jul.

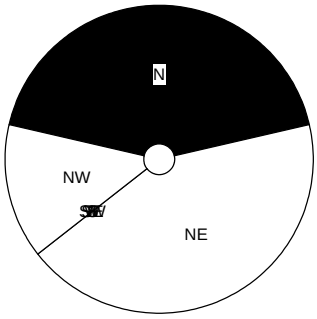


Seedlings (3 records): All without any seedlings present.
Fire Survival : No data.
Age to first flowering: No data.
Height (7 records): 57% 0.2-1 m tall, 43% 1-2 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (7 records): 100% inland - further than 2 km from coast.
Altitude (7 records): 640 - 1300 m; 640 $_{lq}$ - 660 $_{med}$ - 660 $_{uq}$m.

Landform (7 records): 86% deep soil, 14% shallow soil.
Slope (7 records): 57% gentle incline, 43% steep incline.
Aspect (7 records): 79% North, 21% East.





Soil Type (7 records): 57% loamy, 14% sandy, 14% gravelly, 14% rocky.
Soil Colour (7 records): 71% brown, 29% grey.
Geology (7 records): 71% granite, 29% shale.
Vegetation (7 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered B1a(i)b(i,ii,iii,iv,v)c(iv) + 2a(i)b(i,ii,iii,iv,v)c(iv), D.
Occurrence (Fynbos): 33 km^2 with 100% conserved and 1% lost; Occupancy: 6 km^2 with 100% conserved and 6% lost. Fragmentation index: 18%.
Nature Reserves (7 records): 14% in Nature Reserves - inadequately conserved.
Habitat destruction (7 records): 86% extensive natural habitat, 14% naturally linear habitats.
Alien Invasive Species (7 records): 71% Fabaceae (chiefly alien *Acacia*), 29% *Pinus*.
Alien Density (7 records): 100% sparse.

Cultivation & Utilization:
Picking (5 records): 40% lightly picked, 40% severely picked, 20% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Only one remaining 'demonstration' female cone observed, buds observed on couple of male plants (SHR98090605);
Only one plant had a cone - others appeared younger than surrounding bush (WIJ99031307);
Malblokskloof! Last recorded 1824! (AGR98082003);

Confusing Species: None noted.

Variation and Taxonomy: No variation known.

Distribution: Add.

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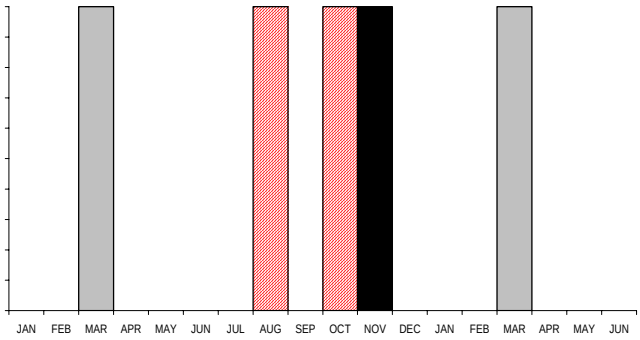
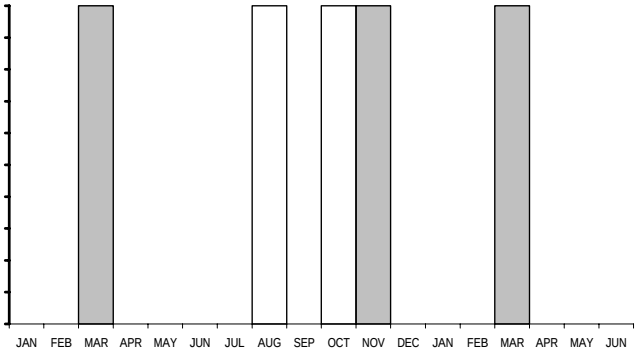
Leucadendron immoderatum Rourke 2005
Lollipop Conebush

Other Common Names: None.
Other Scientific Names: None.

5 Records
Population (5 records): 100% Frequent.
Dispersion (5 records): 100% clumped.
Flowering (5 records with: Jan 0, Feb 0, Mar 1, Apr 0, May 0, Jun 0, Jul 0, Aug 1, Sep 0, Oct 2, Nov 1, Dec 0): Buds from Aug to Oct; Flowering not recorded; Peak Flowering from Nov; Over not recorded; Fruit from Mar; Nothing not recorded. Peak levels unreliable at 100% in Nov. Historically not known.

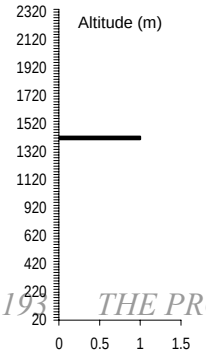


Growth (5 records with: Jan 0, Feb 0, Mar 1, Apr 0, May 0, Jun 0, Jul 0, Aug 1, Sep 0, Oct 2, Nov 1, Dec 0): Much not recorded; Rare from Nov to Mar; None from Aug to Oct. Peak levels unreliable at 100% from Nov and Mar.



Seedlings (3 records): All without any seedlings present.
Fire Survival : No data.
Age to first flowering: No data: all data from mature veld.
Height (5 records): 100% 1-2 m tall.
Pollinators (2 records): 50% flies, 50% beetles.
Detailed Pollinators (1 record): Scarab Beetle.

Habitat:
Distance to Ocean (3 records): 100% inland - further than 2 km from coast.
Altitude (3 records): 1300 - 1320 m; 1300 $_{lq}$ - 1320 $_{med}$ - 1320 $_{uq}$m.



Landform (3 records): 100% deep soil.
Slope (3 records): 100% gentle incline.
Aspect (3 records): 83% North, 17% West.

Soil Type (3 records): 33% sandy, 33% loamy, 33% gravelly.
Soil Colour (3 records): 67% grey, 33% brown.
Geology (3 records): 67% sandstone, 33% shale.
Vegetation (3 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Critically Endangered B1a(ii)c(iv) + 2a(ii)c(iv), D.
Occurrence (Fynbos): 1 km^2 with 100% conserved and 0% lost; Occupancy: 3 km^2 with 100% conserved and 0% lost. Fragmentation index: meaningless.
Nature Reserves (3 records): 100% in Nature Reserves - well conserved.
Habitat destruction (3 records): 100% extensive natural habitat.
Alien Invasive Species (3 records): 67% *Pinus*, 33% none.
Alien Density (3 records): 33% alien-free, 67% sparse.

Cultivation & Utilization:
Picking (4 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Spectacular ivory yellow involucral leaves (SHRY1101901);
As a new species on our last AGM! Suggested atlassing name of *climacticum* (AGRY1032106);
AGRY1032106 PN About 16 Plants Seen;
There are about 20 young plants. It was interesting that although the plants had not burnt there was recruitment - a few adult plants had died and released their seed so this surely explains the recruitment. There were 20 adult plants (NGFY1081101);
Tons and tons of pollinators - more like a Sugarbush than a Conebush - thousands of stripy-elytra beetles, lots of Scarab Beetle *Trichotetha fascicularis* and also butterflies. Also lots on female cones. Very unlike other Conebushes! (AGRY1111204);

Confusing Species: No confusion, this is a very distinct species.
Records of identification queries = 1.

Variation and Taxonomy: Add.

Distribution: Add.

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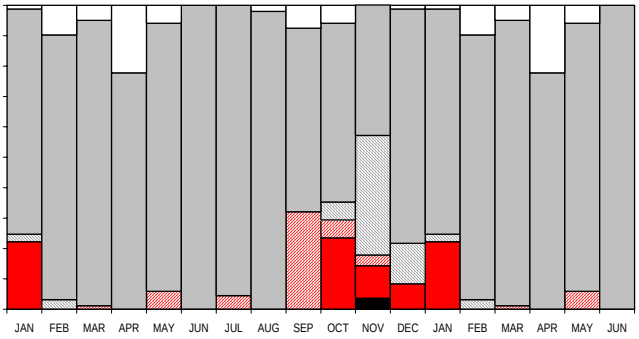
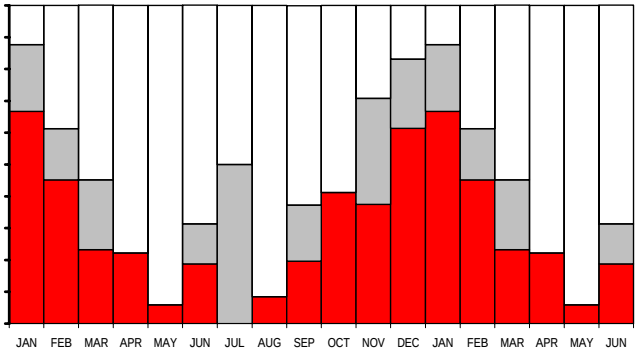
Leucadendron muirii Phill. 1915
Silver-ball Conebush
Kruiphout

Other Common Names: Silver-cone Conebush, Silvercone, *Asbos, Astolbos, Kalkranttolbos, Luisiesbos.*
Other Scientific Names: None.

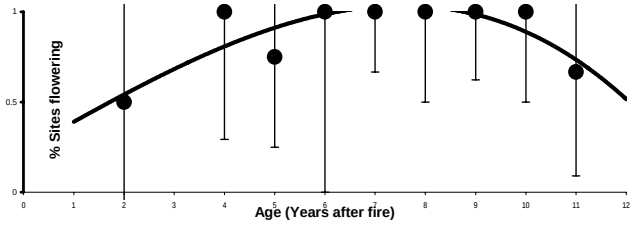
608 Records0.5% Abundant, 47% Common, 46% Frequent, 7% Rare.
Dispersion (573 records): 84% variable, 12% clumped, 3% widespread.
Flowering (571 records with: Jan 81, Feb 31, Mar 82, Apr 9, May 17, Jun 16, Jul 22, Aug 49, Sep 53, Oct 17, Nov 28, Dec 166): Buds from Sep; Flowering from Jan and Oct; Peak Flowering not significant; Over from Nov; Fruit from all year round; Nothing from Apr. Peak levels at 57% in Nov. Historically recorded as flowering from Nov to Dec, fruit retained.



Growth (563 records with: Jan 81, Feb 31, Mar 82, Apr 9, May 17, Jun 16, Jul 22, Aug 47, Sep 51, Oct 17, Nov 24, Dec 166): Much from Sep to Apr; Rare from Nov to Jan, Mar, and Jul; None from Feb to Nov. Peak levels at 88% in Jan.

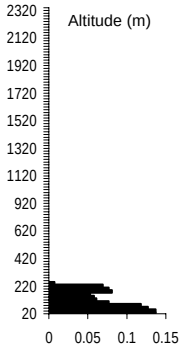


Seedlings (332 records): Absent in 91%: fewer seedlings than prefire adults in 4 cases, and more in 11 cases. Seedlings found in Jan (3), Feb, Mar, Apr, Nov and Dec (8).
Fire Survival (17 records): 76% survived by seedlings only, 12% escaped fires in fire-safe areas, 6% eliminated from the area by fires, 6% resprouted from underground boles.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 2 years, and 100% recorded at 6 years.

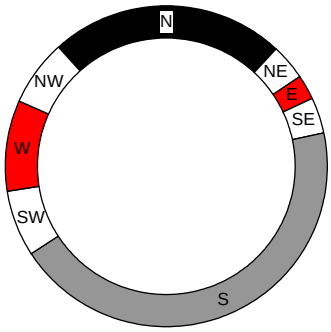


Height (574 records): 1% 0-0.2 m tall, 53% 0.2-1 m tall, 45% 1-2 m tall, 2% 2-5 m tall.
Pollinators (8 records): 75% flies, 13% bees or wasps, 13% beetles.
Detailed Pollinators (1 record): Ladybird Beetle.

Habitat:
Distance to Ocean (603 records): 85% inland - further than 2 km from coast.
Altitude (603 records): 20 - 240 m; 20 $_{lq}$ - 60 $_{med}$ - 80 $_{uq}$m.



Landform (589 records): 60% shallow soil, 36% deep soil, 4% rocky outcrops.
Slope (590 records): 40% gentle incline, 24% platform, 14% hill top, 13% dunes, 7% steep incline, 2% valley bottom.
Aspect (388 records): 49% South, 29% North, 15% West, 6% East.



Soil Type (582 records): 60% sandy, 24% loamy, 12% rocky, 3% gravelly, 1% clayey.
Soil Colour (574 records): 50% grey, 32% brown, 8% black, 3% white, 3% yellow, 3% red.
Geology (596 records): 98% limestone, 1% sandstone.
Vegetation (602 records): 98% shrubland, 2% thicket.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 2 158 km^2 with 25% conserved and 22% lost; Occupancy: 552 km^2 with 45% conserved and 16% lost. Fragmentation index: 14%.
Nature Reserves (603 records): 51% in Nature Reserves - well conserved.

Habitat destruction (580 records): 91% extensive natural habitat, 7% islands, 1% naturally fragmented habitats.
Alien Invasive Species (576 records): 64% Fabaceae (chiefly alien *Acacia*), 33% none, 1% other aliens, 1% Myrtaceae.
Alien Density (575 records): 33% alien-free, 37% sparse, 16% abundant, 13% dense, 1% impenetrable.

Cultivation & Utilization:
Picking (446 records): 98% no sign of picking, 2% lightly picked.
Cultivation Status: Plantings - 1 record, Escapes - 4 records.

Atlassers Notes:
One plant. A low spreading form (LYM97113017);
Almost all plants look very 'young'. according to farmer grows very slowly on 'harde duine' and much older than they look (AWA95092607); Some very tall plants in this area of deeper soil (TLE92080103);
Had some difficulty obtaining seed as serotinous cones had been bored out by insects: had to cut open a fresh cone (grey) to obtain seed (CAE93100601);
More males in new growth - almost 3x more than female (AGR95122711); Far more females than males (JAT94120901);
Piles of burned cones = 1 and piles of cones unburned = 2. Purpose unknown! (AGR96010101); Piles of cones - 7 seen along road - some with string (AGR96010102); 7 piles of stems and cones seen! Mainly cones (AGR96010103); Some piles of cones seen (AGR96010104); 5 piles of cones seen: plucked but not tied up into bunches of cones! Why? Cut off, not plucked! (AGR96010106);
All growing in gravel brought in for the road - confined to road margin and doing very well (AGRY1022801); Growing on road gravel only (AMMY1022801);
Strong semen-like odour at this site (typical, but normally much fainter) (AGR97010122);

Confusing Species: A very distinct species not easily confused with any other species in the field. Nevertheless it is has been occasionally confused with *L. coniferum* and *meridianum*.
Records of identification queries = 7.
Records of corrected identification queries = 3.

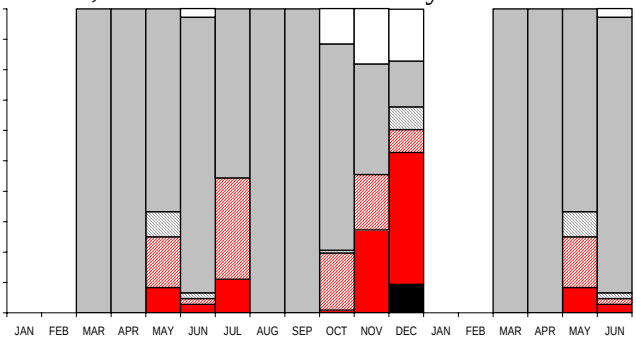
Variation and Taxonomy: No known variation.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDMUIR_m.jpg" * MERGEFORMAT \d

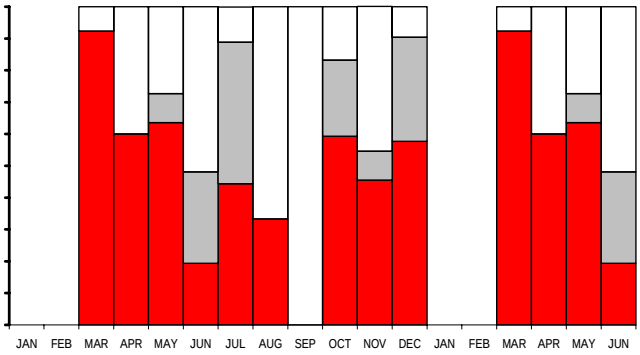
Leucadendron nobile Williams 1967
Karoo Conebush
Naaldblaartolbos

Other Common Names: Needle-leaf Conebush.
Other Scientific Names: *None.*

374 Records
Population (369 records): 31% Common, 54% Frequent, 14% Rare.
Dispersion (342 records): 64% variable, 34% clumped, 2% evenly distributed.
Flowering (345 records with: Jan 0, Feb 0, Mar 13, Apr 10, May 12, Jun 108, Jul 9, Aug 15, Sep 2, Oct 112, Nov 11, Dec 53): Buds from Jul and Oct to Nov; Flowering from Nov to Dec; Peak Flowering and Over not significant;; Fruit from Mar to Nov; Nothing not significant. Peak levels unreliable at 68% in Dec. Historically recorded as flowering from Oct to Mar, but mainly in Dec, fruit retained for several years.



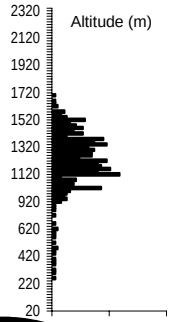
Growth (344 records with: Jan 0, Feb 0, Mar 13, Apr 10, May 11, Jun 108, Jul 9, Aug 15, Sep 2, Oct 113, Nov 11, Dec 52): Much from Oct to May and Jul to Aug; Rare from Jun to Jul, Oct and Dec; None from Apr to Jun and Aug to Sep and Nov. Peak levels unreliable at 92% in Mar.



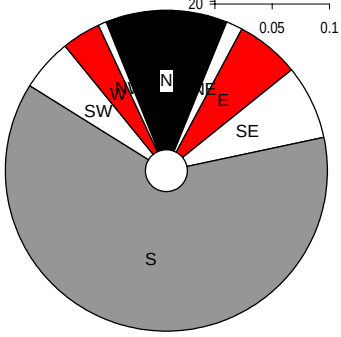
Seedlings (214 records): Absent in 93%: more seedlings than prefire adults in 8 cases. Seedlings found in Oct (7) and Dec.
Fire Survival (37 records): 78% survived by seedlings only, 11% escaped fires in fire-safe areas, 8% eliminated from the area by fires, 3% resprouted from underground boles.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 4-6 years, and 100% recorded at 7 years.

Height (355 records): 3% 0-0.2 m tall, 11% 0.2-1 m tall, 54% 1-2 m tall, 31% 2-5 m tall.
Pollinators (3 records): 67% flies, 33% beetles.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (374 records): 100% inland - further than 2 km from coast.
Altitude (374 records): 240 - 1600 m; 1000 $_{lq}$ - 1100 $_{med}$ - 1220 $_{uq}$m.



Landform (371 records): 67% shallow soil, 31% deep soil, 2% rocky outcrops.
Slope (370 records): 47% steep incline, 36% gentle incline, 11% hill top, 5% cliff, 1% platform.
Aspect (336 records): 69% South, 14% North, 10% East, 7% West.



Soil Type (364 records): 51% loamy, 26% rocky, 13% sandy, 6% gravelly, 4% clayey.
Soil Colour (362 records): 65% brown, 26% grey, 6% orange, 2% red, 1% yellow.
Geology (267 records): 96% sandstone, 4% shale.
Vegetation (372 records): 95% shrubland, 4% grassland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 2 145 km^2 with 57% conserved and 0% lost; Occupancy: 442 km^2 with 32% conserved and 1% lost. Fragmentation index: 7%.
Nature Reserves (374 records): 29% in Nature Reserves.
Habitat destruction (366 records): 96% extensive natural habitat, 2% naturally linear habitats, 2% islands.
Alien Invasive Species (364 records): 91% none, 8% other aliens.

Alien Density (364 records): 91% alien-free, 9% sparse.

Cultivation & Utilization:
Picking (279 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Cones on one plant red (WMP98061905);
They also appear to be long-lived and can tolerate (or are adopted to) a fire frequency of over 40 years (DEB92102401);
Lots dead (AGRY0100516); 6 dead skeletons seen (AGRY0123001); 1 young per 5 skeletons (AGRY0123003); A few dead (IVM98061904); 5 dead on plot (WMP98061903);
Well established and very healthy (DFJ98040402); Very good healthy stands not "rare" in these parts it seems (DFJ98040403);
Both male (AGRY2112020); 1 plant (SGAY0123010);
Also small flying beetles less than 10 mm long (WIJY0122307);
Only in south-facing ridges on north slopes (AGRY0100328); Appears to tolerate hotter, dryer condition found at lower altitudes - although usually restricted to steep south slopes when low down (300 - 600 m). This is the lowest (altitude) population I've seen (DEB92102401);

Confusing Species: None noted.
Records of identification queries = 2.

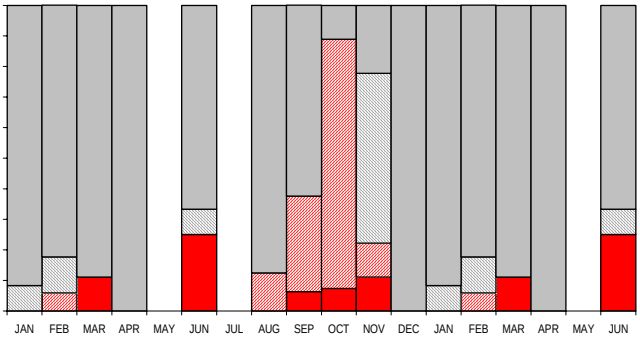
Variation and Taxonomy: No variation noted.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDNOBI_m.jpg" * MERGEFORMAT \d

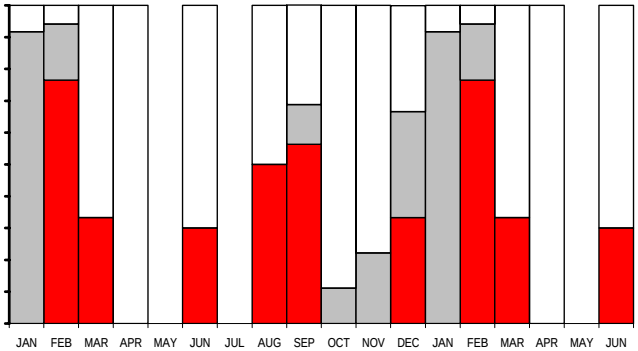
Leucadendron osbornei Rourke 1997
Laingsburg Conebush
Astol

Other Common Names: *Asbos, Klein Comosum.*
Other Scientific Names: None.

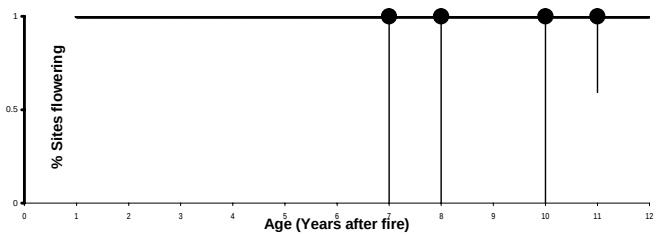
141 Records
Population (141 records): 21% Common, 57% Frequent, 21% Rare.
Dispersion (129 records): 50% variable, 37% clumped, 11% widespread, 2% evenly distributed.
Flowering (139 records with: Jan 12, Feb 17, Mar 9, Apr 26, May 0, Jun 12, Jul 0, Aug 8, Sep 16, Oct 27, Nov 9, Dec 3): Buds from Sep to Oct; Flowering from Jun!; Peak Flowering not recorded; Over from Nov; Fruit from Nov to Sep; Nothing not recorded. Peak levels at 89% in Oct. Historically not known.



Growth (137 records with: Jan 12, Feb 17, Mar 9, Apr 26, May 0, Jun 10, Jul 0, Aug 8, Sep 16, Oct 27, Nov 9, Dec 3): Much from Feb to Mar , Jun, Aug to Sep and Dec; Rare from Nov to Jan; None from Mar to Dec. Peak levels at 94% in Feb.

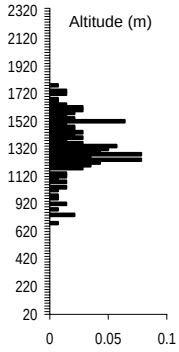


Seedlings (50 records): All without any seedlings present.
Fire Survival (2 records): 50% survived by seedlings only, 50% escaped fires in fire-safe areas.
Age to first flowering: First flowers recorded at 100% at 7 years, no data for younger veld.

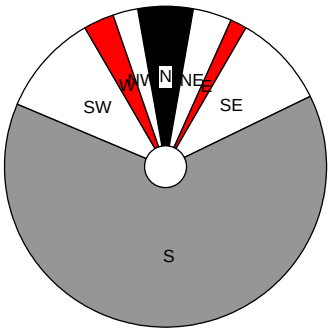


Height (140 records): 14% 0.2-1 m tall, 75% 1-2 m tall, 11% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (141 records): 100% inland - further than 2 km from coast.
Altitude (141 records): 660 - 1680 m; 1120 *lq* - 1180 *med* - 1260 *uq*m.



Landform (141 records): 84% shallow soil, 11% rocky outcrops, 5% deep soil.
Slope (141 records): 58% steep incline, 26% gentle incline, 8% hill top, 4% cliff, 3% platform, 1% valley bottom.
Aspect (127 records): 73% South, 10% West, 9% North, 8% East.



Soil Type (140 records): 34% rocky, 31% sandy, 24% loamy, 9% gravelly, 1% clayey.
Soil Colour (140 records): 45% brown, 36% grey, 14% orange, 4% black.
Geology (134 records): 99% sandstone, 1% shale.
Vegetation (141 records): 100% shrubland.

Conservation Status and Threat:
Red Data List Status: Least Concern.
Occurrence (Fynbos): 595 km^2 with 32% conserved and 0% lost; Occupancy: 140 km^2 with 37% conserved and 0% lost. Fragmentation index: 9%.
Nature Reserves (141 records): 37% in Nature Reserves.
Habitat destruction (139 records): 93% extensive natural habitat, 6% naturally linear habitats.
Alien Invasive Species (139 records): 100% none.
Alien Density (139 records): 100% alien-free.

Cultivation & Utilization:

Picking (131 records): 100% no sign of picking.
Cultivation Status: No noted cultivation.

Atlassers Notes:
Plants higher up the slope were mostly over, but most of the plants on the lower part of the slope were still in flowers - mostly males (LYM96121601);
5 skeletons found - but older than last fire cycle - a bigger population thrived here in the past (AGRY0032011);
Ants on some of the flowerheads. Orange Breasted Sunbirds visiting as well (LYM96121601);

Confusing Species: Before it was recognized as a new species was misidentified as: *L. comosum* (48% of corrected queries, but has distinctively ridged cones), *nobile* (44%, which is very similar, but has longer leaves and cones) and *teretifolium* (7%, but has shorter cones and leaves). However, it is possible that some misidentifications with *L. teretifolium* – with which it is most similar, have not been detected as the two species ranges overlap and both sometimes co-occur, so that errors are not obvious. In fact, the major obstacle to getting this species recognized as distinct was proving that it was different from *L. teretifolium,* an effort for which David Osborne, justly deserves having this species named in his honour.
Records of identification queries = 33.
Records of corrected identification queries = 27.

Variation and Taxonomy: No variation noted.

Distribution: Add.
INCLUDEPICTURE
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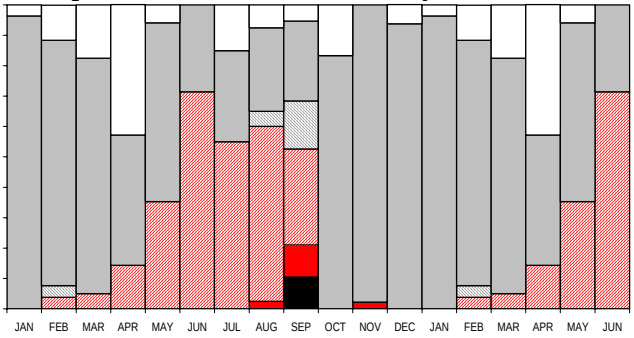
MERGEFORMAT \d

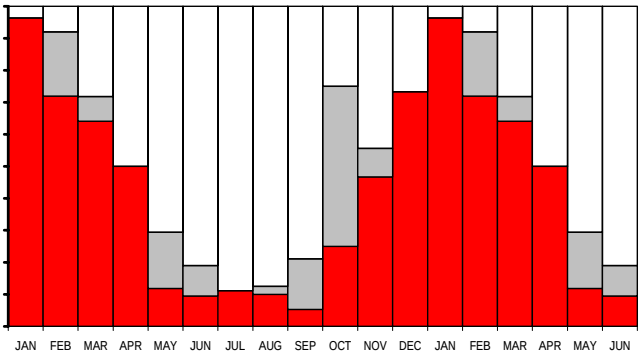
Leucadendron platyspermum R.Br. 1810
Plate-seed Conebush
Knobkerrie

Other Common Names: Flat-seed Conebush, Platty, Platystar, *Geelbos, Kerriebos, Knopkerriestolbos, Kraaltolbos, Kraaltolgeelbos, Platy, Swartbal.*
Other Scientific Names: *comosa* (Thunb) 1781, *comosum* (Salisb. ex Knight) 1809, *polysperma* Poir 1816.

320 Records
Population (256 records): 2% Abundant, 41% Common, 41% Frequent, 16% Rare.
Dispersion (208 records): 62% variable, 36% clumped, 2% evenly distributed.
Flowering (285 records with: Jan 28, Feb 26, Mar 40, Apr 7, May 17, Jun 21, Jul 20, Aug 40, Sep 19, Oct 6, Nov 45, Dec 16): Buds from May to Sep; Flowering and Peak Flowering not significant from Sep; Over not significant; Fruit from all year round; Nothing from Apr. Peak levels at 68% in Sep. Historically recorded as flowering from Sep, fruit retained for several years.



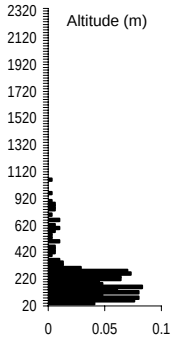
Growth (277 records with: Jan 28, Feb 25, Mar 39, Apr 6, May 17, Jun 21, Jul 18, Aug 40, Sep 19, Oct 4, Nov 45, Dec 15): Much from Oct to Apr; Rare from Feb and Oct; None from Mar to Dec. Peak levels at 96% in Jan.



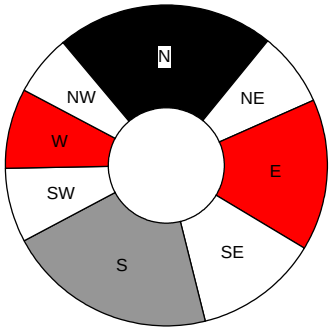
Seedlings (115 records): Absent in 91%: more seedlings than prefire adults in 5 cases. Seedlings found in Feb, Apr, Aug, Oct and Dec.
Fire Survival (6 records): 83% survived by seedlings only, 17% eliminated from the area by fires.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-5 years, and 100% recorded at 6 years.

Height (286 records): 2% 0-0.2 m tall, 47% 0.2-1 m tall, 49% 1-2 m tall, 2% 2-5 m tall.
Pollinators : No data.
Detailed Pollinators: No additional data.

Habitat:
Distance to Ocean (253 records): 100% inland - further than 2 km from coast.
Altitude (253 records): 20 - 620 m; 80 *lq* - 160 *med* - 220 *uq*m.



Landform (225 records): 95% deep soil, 2% rocky outcrops, 2% shallow soil.
Slope (224 records): 63% gentle incline, 20% platform, 10% hill top, 5% steep incline, 1% valley bottom.
Aspect (178 records): 30% North, 28% South, 26% East, 15% West.



Soil Type (224 records): 64% sandy, 19% loamy, 8% clayey, 7% gravelly.
Soil Colour (222 records): 54% grey, 22% brown, 8% white, 8% yellow, 6% orange, 1% red.
Geology (233 records): 67% sandstone, 18% silcrete or ferricrete, 12% shale, 1% Tertiary sands.
Vegetation (251 records): 99% shrubland, 1% plantations.

Conservation Status and Threat:
Red Data List Status: Vulnerable A2c + 4d.
Occurrence (Fynbos): 2 068 km^2 with 8% conserved and 34% lost; Occupancy: 334 km^2 with 9% conserved and 31% lost. Fragmentation index: 10%.
Nature Reserves (253 records): 11% in Nature Reserves - inadequately conserved.
Habitat destruction (219 records): 80% extensive natural habitat, 11% islands, 7% road verges, 1% corridors.

Alien Invasive Species (219 records): 43% Fabaceae (chiefly alien *Acacia*), 30% *Pinus*, 13% none, 8% *Hakea*, 6% Myrtaceae.
Alien Density (217 records): 13% alien-free, 63% sparse, 19% abundant, 4% dense.

Cultivation & Utilization:
Picking (218 records): 83% no sign of picking, 10% lightly picked, 7% severely picked.
Cultivation Status: Plantings - 54 records (17%), Augmentations - 23 records (7%), Escapes - 9 records (3%).
Witch's Broom Infestation: 1 record (0.3%).

Atlassers Notes:
Planted for flower harvesting (CSS97112909); Planted in orchard – picked (MAJY1031404); Introduced 10 years ago (MJDY0100801); Certainly planted originally but now regrowing on their own - both spp look healthy (NAH94021904); Broad strips cultivated in between veld (OGM97031506); Road verge next to *l. platyspermum*-planted field (PVR93041708); Planted and looking very healthy (PVR95010605+09); Cultivated (SAS98060609); In straight lines - all rather small for pickings (SMR99052009); Escaped or from seed broadcast after fires (SMR99092902); Partially planted for commercial protea farming perhaps (WIJ99050106);
Many dead plants (OGM96022405);
Lone female on road verge (SHR95120202);

Confusing Species: Remarkably distinct.
Records of identification queries = 3.

Variation and Taxonomy: Remarkably free from variation (Williams 1972), no variation noted by atlassers.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDPLAT_m.jpg" * MERGEFORMAT \d

Leucadendron spirale (Salisb. ex Kn.) Williams 1809, 1967
Wolseley Conebush

Other Common Names: Spiral Chasme.
Other Scientific Names: *scabrum* R.Br. 1810.

0 Records: Extinct

Conservation Status and Threat:
Red Data List Status: Extinct, both in the wild and *ex situ*, last seen in 1933.
Occurrence (Fynbos): 0 km^2 with 0% conserved and 100% lost; Occupancy: 0 km^2 with 0% conserved and 100% lost. Fragmentation index: meaningless. Original occupancy about 23 km^2.

Population: Probably Common and Frequent, but now extinct.
Dispersion: Probably Clumped and Variable.
Flowering: Probably Buds from May to Oct; Flowering from Nov; Peak Flowering and Over not significant; Fruit from all year round; Nothing not significant. Historically recorded as flowering from Nov.
Growth: Probably Much from Nov to Apr; None from May to Oct.
Seedlings: Probably No data.
Fire Survival: Probably surviving as seeds only.
Age to first flowering: Probably flowering young: first flowers at 1 year, 50% at 2 years, and 100% at 4 years.
Height: Probably 80% 0.2-1 m tall, 20% 1-2 m tall.
Pollinators : Probably a few records of Wind pollination.

Habitat:
Distance to Ocean: All 100% inland - more than 2 km from coast.
Altitude: Probably 220 - 400 m; 240 $_{lq}$ - 260 $_{med}$ - 300 $_{uq}$m.
Landform: Probably 80% deep soil, 20 swamp
Slope: Probably 60% valley bottom, 40% gentle incline.
Aspect: Probably 30% South, 25% East, 25% West, 20% north.
Soil Type: Probably 60% loamy, 20% gravelly, 15% clay, 5% sandy.
Soil Colour: Probably 60% brown, 40% grey.
Geology: Probably 40% shale, 20% sandstone, 20% silcrete or ferricrete, 20% Tertiary sands.
Vegetation: Probably 100% shrubland.

Conservation Status and Threat:
Nature Reserves: Probably 0% in Nature Reserves.
Habitat destruction: Probably 100% islands.
Alien Invasive Species: Probably 50% Fabaceae (chiefly alien *Acacia*), 40% *Pinus*, 10% *Hakea*.

Alien Density: Probably 50% sparse, 40% abundant, 10% dense.

Cultivation & Utilization:
Picking: Probably no sign of picking.
Cultivation Status: Probably No noted cultivation.
Witch's Broom Infestation: Possibly 1or 2 records.

Atlassers Notes: *Probably*
What a let down: how can something this non-descript be allowed in the Protea Family.
Walked through the patch for hours before noticed this species: what a wimp.
If this species goes extinct, no one will care!

Confusing Species: Not in the Proteaceae. Although closely related to *L. teretifolium*, the flowerheads and cones are so small that it would more likely be overlooked as a *Passerina* or *Erica*. It is not known if they would have been colourful (yellow) in flower, but given their features suggesting wind pollination, this is unlikely.

Variation and Taxonomy: No variation known.

Ecology: Evidence suggests that it occurred in wet habitats, in dense stands and was wind pollinated. Being serotinous it is extremely unlikely that there are soil-stored seed banks, and therefore the absence of adults suggests extinction. This was grown at Clapham in the early 1800s. It grew readily from cuttings, but according to Salisbury: "possessing little beauty, it should only be admitted in extensive collections" (Knight, 1809).

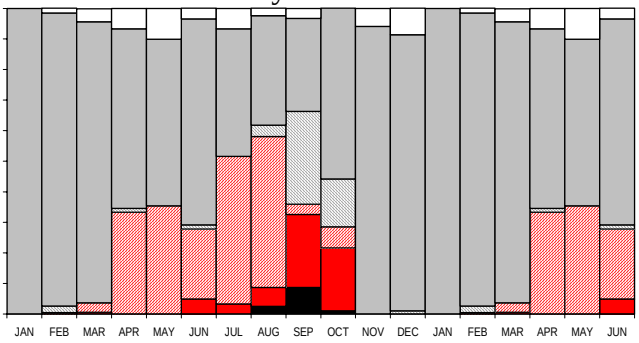
Distribution: Collected in 1801 and 1819 and last seen in 1933 in the Worcester Valley near Wolseley. Occurred from Wolseley to Breede River Station, a 14 km-long range. Extensive searches, in the 1960s and 1990s, the latter accompanied by a reward of SAR 1000 (= $ 170), have yielded no sign of the species.
Bowie's locality of "swamps at Soetmelksrivier and Langkloof" is considered incorrect (as are many of his localities for other species).

INCLUDEPICTURE "C:\\temp\\atlas\\LDSPIR_m.jpg" * MERGEFORMAT \d

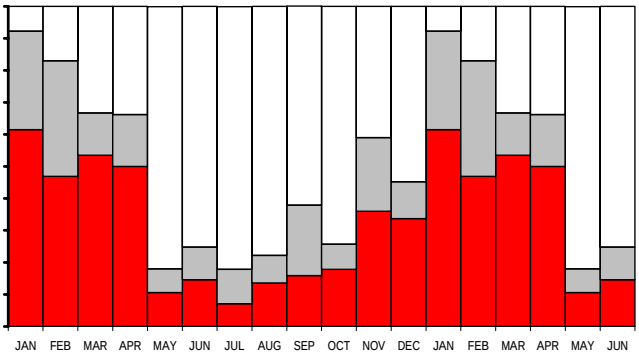
Leucadendron teretifolium (Andrews) Williams 1807, 1967
Needle-leaf Conebush
Silvertops

Other Common Names: Abietinum, Comosum, Round-leaf Chasme, Strawberry Conebush, Terete Conebush.
Other Scientific Names: *abietinum* R.Br. 1810.

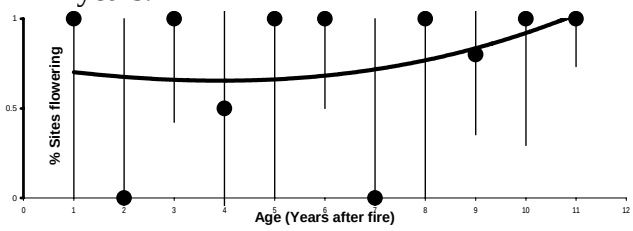
1269 Records
Population (1257 records): 2% Abundant, 39% Common, 48% Frequent, 11% Rare.
Dispersion (1185 records): 63% variable, 31% clumped, 5% widespread, 2% evenly distributed.
Flowering (1225 records with: Jan 13, Feb 193, Mar 161, Apr 75, May 99, Jun 144, Jul 60, Aug 81, Sep 92, Oct 102, Nov 101, Dec 104): Buds from Apr to Aug; Flowering from Sep to Oct; Peak Flowering not significant; Over from Sep; Fruit from all year round; Nothing not significant. Peak levels at 67% in Sep. Historically recorded as flowering from late Aug to early Sep, fruit retained for some years.



Growth (1195 records with: Jan 13, Feb 194, Mar 159, Apr 74, May 94, Jun 137, Jul 56, Aug 81, Sep 82, Oct 101, Nov 100, Dec 104): Much from Nov to Apr; Rare from Jan to Feb, Sep and Nov; None from Mar 33 to Dec. Peak levels at 92% in Jan.

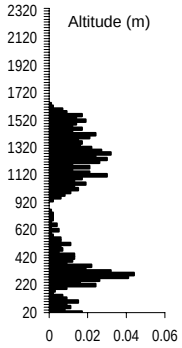


Seedlings (488 records): Absent in 96%: fewer seedlings than prefire adults in 3 cases, and more in 6 cases. Seedlings found in Feb, Mar, May, Jun (2), Jul, Sep and Dec (2).
Fire Survival (39 records): 64% survived by seedlings only, 23% escaped fires in fire-safe areas, 10% eliminated from the area by fires, 3% resprouted from underground boles.
Age to first flowering: First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 3 years and consistently after 10 years, with a hint of senescence after 21 years.

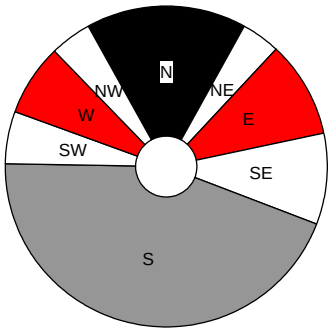


Height (1234 records): 62% 0.2-1 m tall, 37% 1-2 m tall.
Pollinators (10 records): 60% wind, 30% butterflies or moths, 10% beetles.
Detailed Pollinators (1 record): Heady Maiden Moth.

Habitat:
Distance to Ocean (1264 records): 100% inland - further than 2 km from coast.
Altitude (1264 records): 20 - 1540 m; 300 $_{lq}$ - 940 $_{med}$ - 1180 $_{uq}$m.



Landform (1245 records): 65% deep soil, 34% shallow soil, 1% rocky outcrops.
Slope (1247 records): 49% gentle incline, 33% steep incline, 10% hill top, 5% platform, 2% cliff, 1% valley bottom.
Aspect (1083 records): 52% South, 20% North, 16% East, 12% West.



Soil Type (1236 records): 41% loamy, 20% sandy, 15% gravelly, 14% rocky, 10% clayey.
Soil Colour (1226 records): 55% brown, 25% grey, 10% orange, 4% red, 3% yellow, 2% black.
Geology (1098 records): 56% sandstone, 36% shale, 6% silcrete or ferricrete.
Vegetation (1260 records): 99% shrubland.

Conservation Status and Threat:
Red Data List Status: Near Threatened B1a(i),b(ii) + 2a(i),b(ii).
Occurrence (Fynbos): 10 423 km^2 with 20% conserved and 16% lost; Occupancy: 1 254 km^2 with 9% conserved and 23% lost. Fragmentation index: 4%.

Nature Reserves (1264 records): 12% in Nature Reserves - inadequately conserved.
Habitat destruction (1238 records): 83% extensive natural habitat, 12% islands, 2% naturally linear habitats, 2% road verges.
Alien Invasive Species (1216 records): 73% none, 13% Fabaceae (chiefly alien *Acacia*), 6% *Hakea*, 6% *Pinus*, 1% Myrtaceae.
Alien Density (1216 records): 73% alien-free, 22% sparse, 3% abundant, 2% dense.

Cultivation & Utilization:
Picking (910 records): 99% no sign of picking, 0.7% lightly picked, 0.1% severely picked.
Cultivation Status: Plantings - 3 record.
Witch's Broom Infestation: 4 records (0.3%).

Atlassers Notes:
Is in cone not bud on lower slope (HCE96060701);
Has aborted its buds for this season - Drought? (AGRY0110805); Buds aborted (WMP99080901);
Some individuals survived on the lower side: reshooting! (AGR96121306);
Some plants moribund and falling over (EGH94090111); Many patches are approaching senescence (NGW98072402);
Also lots of chomped - bits lying around by *Otomys* (AGR96081502);
Some chopped up - for grazing ? Or firewood? Apparently not used! (AGR96060701); Huge bundle of cuttings found discarded - far exceeding output of plants in plot (AGRY0041207);
2 females only (AGR91121405);
1 male (AGR97081714, AGRY4031607); Both plant males and can't see any more along road (OUTY1020403); 2 males (SGAY1030813);
All have high mortality - more dead than living plants in portions of the plot (AGRY1012101); A lot of dead plants (AMMY2100912); Some 5% of plants dead (APE92080303); 1 dead plant observed (LYMY0041209); Severe drought related mortality - about 60% dead or dying (NAHY1092803); Many plants dead & dying (OUT96092808); 4 plants dead (OUT99061201); More than half dead (SHRY0041202); Much dead also (SMR99090302); 1/4 dead - covered in Old Mans Beard (VCH99080903);
Was only found on the undeveloped plots in Fisherhaven (JES94012902);
One of a number of quite large patches of natural vegetation almost completely dominated by *L. teretifolium* (NGW98072402);
With peculiar thin stems and fasciation (small leaves but not much branching), a few badly stunted (but tall and thin) plants seen! (AGR96060507, 12, 13);

Confusing Species: Confused with *L. osbornei* (which is a much bigger plant all round, although the two are very similar in size in the Witteberg), and *L pubescens* (which is a totally different plant).
Records of identification queries = 9.
Records of corrected identification queries = 2.

Variation and Taxonomy: Constant in its characters. No variation noted by atlassers.

Distribution: Add.
INCLUDEPICTURE "C:\\temp\\atlas\\LDTERE_m.jpg" * MERGEFORMAT \d