

## Abridged Threatened Species Nomination Form

For nominations/assessments under the Common Assessment Method (CAM) where supporting information is available, but not in a format suitable for demonstrating compliance with the CAM, and assessment against the IUCN Red List threat status.

### Cover Page *(Office use only for Assessment)*

<b>Species name</b> (scientific and common name):	<b><i>Petrophile nivea</i></b>
<b>Nomination for</b> (addition, deletion, change):	<b>Addition</b>
<b>Nominated conservation category and criteria:</b>	<b>VU: D1+D2</b>

Scientific committee assessment of eligibility against the criteria:		
This assessment is consistent with the standards set out in Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding.		Yes <input type="checkbox"/> No <input type="checkbox"/>
<b>A.</b>	Population size reduction	•
<b>B.</b>	Geographic range	•
<b>C.</b>	Small population size and decline	•
<b>D.</b>	Very small or restricted population	•
<b>E.</b>	Quantitative analysis	•

Outcome:			
Scientific committee Meeting date:			
Scientific committee comments:			
Recommendation:			
Ministerial approval:		Date of Gazettal/ Legislative effect:	

# Nomination/Proposal summary *(to be completed by nominator)*

Current conservation status				
Scientific name:	<i>Petrophile nivea</i>			
Common name:	None			
Family name:	Proteaceae	Fauna <input type="checkbox"/>	Flora <input checked="" type="checkbox"/>	
Nomination for:	Listing <input checked="" type="checkbox"/>	Change of status/criteria <input type="checkbox"/>	Delisting <input type="checkbox"/>	
1. Is the species currently on any conservation list, either in a State or Territory, Australia or Internationally? 2. Is it present in an Australian jurisdiction, but not listed?		Provide details of the occurrence and listing status for each jurisdiction in the following table		
Jurisdiction	State / Territory in which the species occurs	Date listed or assessed (or N/A)	Listing category i.e. critically endangered or 'none'	Listing criteria i.e. B1ab(iii)+2ab(iii)
International (IUCN Red List)				
National (EPBC Act)				
State / Territory	1. WA	2010	Vulnerable	D1+D2
	2.			
	3.			
Consistent with Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding, it is confirmed that:				
<ul style="list-style-type: none"> <li>this assessment meets the standard of evidence required by the Common Assessment Method to document the eligibility of the species under the IUCN criteria;</li> </ul>			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:				
<ul style="list-style-type: none"> <li>surveys of the species were adequate to inform the assessment;</li> </ul>			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	No further surveys have been undertaken.			
<ul style="list-style-type: none"> <li>the conclusion of the assessment remains current and that any further information that may have become available since the assessment was completed supports or is consistent with the conclusion of the assessment.</li> </ul>			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	Assessment is consistent, criteria still applies.			
Nominated national conservation status: category and criteria				
Presumed extinct (EX) <input type="checkbox"/>	Critically endangered (CR) <input type="checkbox"/>	Endangered (EN) <input type="checkbox"/>	Vulnerable (VU) <input checked="" type="checkbox"/>	
None (least concern) <input type="checkbox"/>	Data Deficient <input type="checkbox"/>	Conservation Dependent <input type="checkbox"/>		

What are the IUCN Red List criteria that support the recommended conservation status category?		D1+D2			
Eligibility against the IUCN Red List criteria (A, B, C, D and E)					
Provide justification for the nominated conservation status; is the species eligible or ineligible for listing against the five criteria. For <b>delisting</b> , provide details for why the species no longer meets the requirements of the current conservation status.					
A.	Population size reduction (evidence of decline)	<ul style="list-style-type: none"> <li>No further surveys have been undertaken since 2008 so it is not possible to determine if there has been a decline in subpopulation size.</li> <li><b>Unable to assess</b></li> </ul>			
B.	Geographic range (EOO and AOO, number of locations and evidence of decline)	<ul style="list-style-type: none"> <li>Using Minimum Convex Polygon (MCP) the EOO is approximately 0.86 km<sup>2</sup> which was calculated by drawing a polygon around the plants.</li> <li>Area of Occupancy is &lt;10 km<sup>2</sup> based on mapped area of subpopulation of 0.86 km<sup>2</sup> or 86.8 hectares, or estimated AOO 4 km<sup>2</sup> using the 2km x 2km grid method.</li> <li>Known from one location.</li> <li>No further surveys undertaken since 2008 so it is not possible to determine a reduction in range.</li> <li><b>Unable to assess</b></li> </ul>			
C.	Small population size and decline (population size, distribution and evidence of decline)	<ul style="list-style-type: none"> <li>Known from a single location containing 384 mature individuals.</li> <li>No further surveys undertaken since 2008 so it is not possible to determine changes in subpopulation size.</li> <li><b>Unable to assess</b></li> </ul>			
D.	Very small or restricted population (population size)	<ul style="list-style-type: none"> <li>(D1) There are 384 mature individuals.</li> <li>(D2) The species has a restricted area of occupancy and is only known from one location, therefore there is a plausible future threat from clearing, fire or rabbit grazing that could drive the taxon to CR or EX in a very short time.</li> <li><b>Meets criteria for Vulnerable D1+D2</b></li> </ul>			
E.	Quantitative analysis (statistical probability of extinction)	<ul style="list-style-type: none"> <li>No information to assess.</li> </ul>			
Summary of assessment information					
EOO	0.86 km <sup>2</sup> (MCP) – calculated to 4 km <sup>2</sup> based on the AOO estimation	AOO	4 km <sup>2</sup> (2 km x 2 km grid), mapped area of subpopulation 0.86 km <sup>2</sup>	Generation length	-
No. locations	1	Severely fragmented	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>		
No. subpopulations	1	No. mature individuals	384		

Percentage global population within Australia	100	
Percentage population decline over 10 years or 3 generations	Unknown	
<b>Threats</b> <i>(detail how the species is being impacted)</i>		
<b>Threat</b> <i>(describe the threat and how it impacts on the species. Specify if the threat is past, current or potential)</i>	<b>Extent</b> <i>(give details of impact on whole species or specific subpopulations)</i>	<b>Impact</b> <i>(what is the level of threat to the conservation of the species)</i>
Clearing <ul style="list-style-type: none"> <li>The subpopulation occurs on remnant vegetation on private property which is potentially threatened from clearing for agriculture.</li> </ul> Past and future	Whole population	Catastrophic
Altered fire regimes <ul style="list-style-type: none"> <li>It is not known what the fire response of the species is. Frequent fire may result in a reduced seed bank if it occurs before plants reach maturity.</li> </ul> Past, current and future	Whole population	Severe
Rabbits <ul style="list-style-type: none"> <li>Rabbits pose no threat at present but may cause a problem to seedlings if the area is burnt.</li> <li>Grazing impacts on the establishment of seedlings and thereby limiting natural recruitment.</li> <li>Disturbance to plants and roots from rabbit diggings.</li> </ul> Future	Whole population	Severe
Small subpopulation size <ul style="list-style-type: none"> <li>The species is only known from a single subpopulation, placing it under serious threat from a single threatening process.</li> </ul> Future	Whole population	Catastrophic
Drought <ul style="list-style-type: none"> <li>Equivalent to a major disturbance.</li> </ul> Past, current, future	Whole population	Severe
<b>Management and Recovery</b>		
Is there a Recovery Plan (RP) or Conservation Management Plan operational for the species?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
<i>List all relevant recovery or management plans (including draft, in-preparation, out-of-date, national and State/Territory recovery plans, recovery plans for other species or ecological communities, or other management plans that may benefit or be relevant to the nominated species).</i>		

*List current management or research actions, if any, that are being undertaken that benefit the conservation of the species.*

- Monitoring and surveys have been carried out to determine plant numbers and impact of threats;
- Fencing of remnant vegetation on private property containing the subpopulation;
- Liaison with private property owners to ensure protection of remnant vegetation;
- Protecting the sites from fire unless required for ecological reasons, and implemented early intervention in any wildfires which may threaten the site;
- Monitoring the subpopulation for evidence of weed and rabbit impacts, or changes in plant or site health;
- Surveying for additional subpopulations.

*List further recommended management or research actions, if any, that would benefit the conservation of the species. Please ensure that this section addresses all identified threats.*

#### Management

- Ongoing monitoring and observations of subpopulation and threats;
- Collect and store seed to guard against the extinction of the natural subpopulation. Collections should aim to sample and preserve the maximum range of genetic diversity possible;
- Develop and implement a fire management strategy, including associated weed control measures and the need for and method of the construction and maintenance of firebreak;
- Control rabbits if required;
- Develop a translocation proposal and select a disease free translocation site;
- Map habitat critical to the survival of the species to facilitate its protection and appropriate management;
- Investigate formal conservation arrangement, management agreement and covenant on private land, and investigate inclusion in reserve tenure if possible;
- Promote awareness of the species with general public.

#### Research

- Research biology and ecology of the species, with a focus on pollination effectiveness, seed viability, conditions required for natural germination, response to threats and disturbances and reproductive biology.

**Nomination prepared by:**

**Contact details:**

**Date submitted:**

22/9/2016

*If the nomination has been refereed or reviewed by experts, please provide their names and contact details:*

Location of *Petrophile nivea* with remnant vegetation and conservation estate





Summary of subpopulation information <i>(detailed information to be provided in the relevant sections of the form)</i>						
Location <i>(include coordinates)</i>	Land tenure	Year/no. mature individuals	AOO	Site / habitat Condition	Threats <i>(note if past, present or future)</i>	Specific management actions
Subpopulation 1: Hi Valley Farm, 4.2 to 5.7km north of Tootbardi Rd, near Badgingarra	Private property	2001: 10 (not full survey) 2008: 384	86.8 ha	Healthy	Clearing (past, future) Fire (past, present, future) Rabbits (future) Small population size (future) Climate change (future)	Develop a fire management plan Control rabbits when required Collect seed and test viability, conduct regeneration trials Establish new subpopulations through translocation Liaise with landowners Improve security of subpopulation through conservation covenant



## Form to nominate a Western Australian species for listing as threatened, change of category or delisting (Updated 2016).

To fill out this form you must refer to the Guidelines. Incomplete forms may result in delays in assessment, or rejection of the nomination.

Answer all relevant sections, filling in the white boxes and indicating when there is no information available. To mark boxes with a cross ☒: on the **View** menu, point to **Toolbars**, and then click **Forms**. Click **Protect Form** , then check the box. Unlock the form by clicking  and you will then be able to type text in the white table cells.

**Note**, this application form applies to both flora and fauna species, and hence some questions or options may not be applicable to the nominated species – for these questions, type “N/A”.

<b>SECTION 1. NOMINATION</b>	
<b>1.1. Nomination information</b>	
Flora <input checked="" type="checkbox"/>	Fauna <input type="checkbox"/> Nomination for: Addition <input checked="" type="checkbox"/> Change of category <input type="checkbox"/> Delisting <input type="checkbox"/>
<b>1.2. Scientific Name</b> This name will be used to identify the species on all official documentation. Use the approved name used by the Western Australian Museum or Herbarium. If this is not possible, use unpublished names or numbers of voucher specimens.	
<i>Petrophile nivea</i>	
<b>1.3. Common Name</b> If the species has a generally accepted common name, please show it here. This name will be used on all official documentation.	
None	
<b>1.4. Current Conservation Status. If none, type 'None'.</b>	
International IUCN Red List Category and Criteria applicable to the highest rank category only e.g. Vulnerable (B1ab(iv);D(1))	None
National EPBC Act 1999 Category	None
State of WA Wildlife Conservation Notice Schedule	Vulnerable
State of WA IUCN Category	D1+D2
State of WA Priority	None
Is the species listed as 'Threatened' in any other Australian State or Territory? If Yes, list these States and/or Territories and the status for each.	
No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>	



<b>Does the species have specific protection (e.g. listed on an annex or appendix) under any other legislation, inter-governmental or international arrangements e.g. CITES? If Yes, please provide details.</b>	
No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>	
<b>1.5. Nominated Conservation Status. Type one category for each of the fields. If none, write 'None'.</b>	
<b>International IUCN Red List Category and Criteria applicable to the highest rank category only e.g. Vulnerable (B1ab(iv);D(1))</b>	<b>Vulnerable D1+D2</b>
<b>National EPBC Act 1999</b>	<b>Vulnerable D1</b>
<b>State of WA Wildlife Conservation Notice Schedule</b>	<b>Schedule 3</b>
<b>State of WA IUCN Category</b>	<b>Vulnerable D1+D2</b>
<b>State of WA Priority</b>	<b>None</b>
<b>1.6. Reasons for the Nomination.</b> <b>Briefly summarise the reasons for the nomination in dot points. Please include details relevant to the IUCN Categories and Criteria where appropriate.</b>	
<p><i>Petrophile nivea</i> was first collected by Mike Hislop in May 1999 from a remnant on private property, commonly referred to as Hi Vallee. After several searches in the nearby area, this remains the only known subpopulation. The subpopulation is scattered over a quarter of the 350 hectare remnant, preferring to grow in shallow white sand over laterite in heathland that is very rich in Proteaceae.</p> <p>It is unknown if <i>Petrophile nivea</i> had subpopulations in bushland within the adjoining area, as the current location is positioned in an area of agriculture land that was cleared many years ago.</p> <p><i>Petrophile nivea</i> is a species that is easy to identify outside of its flowering period, and many search efforts have been conducted without success. The single known subpopulation of this species is locally common, but is restricted in its distribution.</p> <p>(WAHerb, 2009)</p> <p>(Hislop &amp; Rye, 2002)</p>	

<b>SECTION 2. SPECIES</b>
<b>2.1. Taxonomy.</b> <b>Describe the taxonomic history, using references, and describe the key distinguishing features that can be used to separate this taxon from closely related taxa. Include details of the type specimen, changes in taxonomy, scientific names and common names used for the species.</b>
<p>The closest relative to <i>Petrophile nivea</i> appears to be <i>P. brevifolia</i>. They coexist on the remnant, but the earlier flowering time of <i>P. nivea</i> seems to prevent any possibility of hybridisation.</p> <p><i>P. nivea</i> coexist with a further nine species of <i>Petrophile</i>, but is easily distinguished from them by having pure white flowers, crowded leaves that largely conceal the surfaces of the branchlets and involucre bracts, long perianth hairs and small cones. This species can further be characterised by its dense zigzag growth pattern, with short seasonal growth increments that are produced at a wide angle (45°) from the terminal point of the previous season's growth.</p> <p>(Hislop &amp; Rye, 2002)</p>
<b>Is this species conventionally accepted? If no, explain why. For example, is there any controversy about the taxonomy? For undescribed species, detail the location of voucher specimens (these should be numbered and held in a recognised institution and be available for reference purposes).</b>
No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>
<b>Describe any known hybridisation with other species in the wild, indicating where this occurs and how frequently.</b>
<p>No hybridisation has been recorded for this species.</p> <p>(Hislop &amp; Rye, 2002)</p>
<b>2.2. Description</b> <b>Describe the physical appearance, habit, behaviour/dispersion and life history. Include anatomy or habit (e.g. size and/or weight, sex and age variation, social structure) and dispersion (e.g. solitary, clumped or flocks etc), and life history (eg short lived, long lived, geophytic, etc).</b>
<p><i>Petrophile nivea</i> is an upright, woody, rigid shrub growing from 0.4 - 0.6 m high and to a width of 0.3 – 0.4 m, without a lignotuber. The branches are glabrous and are crowded with blue-green leaves, largely concealing the surfaces. The terete (cylindrical and slightly tapering) leaves are gently s-shaped, 10-15 mm long by 1-1.5 mm wide with a slightly recurved apex and a pungent point.</p> <p>The flower heads are pure white, sessile and are found on the end of branchlets. The nuts are broadly ovate-cordate in outline, 3 x 2.5 mm and predominantly beaked.</p> <p>(Hislop &amp; Rye, 2002)</p>

<b>2.3. Distribution</b>
<b>Describe the distribution of the species in Australia and, if possible, provide a map.</b>
<p><i>Petrophile nivea</i> is endemic to Western Australia, occurring in the South West Botanical Province. The only known subpopulation is located in the Northern Agricultural NRM Region and fall in the Geraldton Sandplains IBRA Region. Towns near the subpopulation include Badgingarra.</p> <p>Please see map attached.</p>
<b>2.4. Habitat</b>
<b>Describe the non-biological habitat (e.g. aspect, topography, substrate, climate) and biological habitat (e.g. forest type, associated species, sympatric species). If the species occurs in various habitats (e.g. for different activities such as breeding, feeding, roosting, dispersing, basking etc) then describe each habitat.</b>
<b>Non-biological habitat</b>
<p><i>Petrophile nivea</i> grows in shallow white sand over laterite in heathland that is very rich in Proteaceae.</p>
<b>Biological habitat</b>
<p><i>Petrophile nivea</i> is found in heathland that is very rich in Proteaceae, including ten other species of <i>Petrophile</i>. The associated <i>Petrophile</i> species are <i>P. aculeata</i> Foreman, <i>P. brevifolia</i>, <i>P. chrysantha</i> Meisn., <i>P. linearis</i> R. Br., <i>P. macrostachya</i> R. Br., <i>P. megastegia</i> F. Muell., <i>P. scabriuscula</i> Meisn., <i>P. serruriae</i> R. Br., <i>P. shuttleworthiana</i> and <i>P. striata</i> R. Br.</p> <p>(Hislop &amp; Rye, 2002)</p>
<b>Does the (fauna) species use refuge habitat e.g. in times of fire, drought or flood? Describe this habitat.</b>
N/A
<b>Is the species part of, or does it rely on, a listed threatened ecological community? Is it associated with any other listed threatened species?</b>
<p><i>Petrophile nivea</i> is not part of, or reliant on a listed threatened ecological community. <i>P. nivea</i> does however coexist in the 350ha remnant with 4 other species of Declared Rare Flora (<i>Acacia wilsonii</i>, <i>Eucalyptus lateritica</i>, <i>E. leprophloia</i> and <i>E. suberea</i>). The remnant also contains 33 species of priority flora, 13 of which are restricted geographically or reside on unsecure tenure.</p> <p>Priority Flora include: <i>Allocasuarina ramosissima</i> (P3), <i>Arnocrinum gracillimum</i> (P2), <i>Astroloma</i> sp Cataby (P4), <i>Banksia catoglypta</i> (P2), <i>Banksia kippistiana</i> var. <i>paenepeccata</i> (P3), <i>Banksia nobilis</i> subsp <i>fragrans</i> (P3), <i>Banksia sclerophylla</i> (P4), <i>Banksia splendida</i> subsp <i>macrocarpa</i> (P3), <i>Banksia tortifolia</i> (P3), <i>Beaufortia bicolor</i> (P3), <i>Boronia scabra</i> subsp <i>condensata</i> (P2), <i>Calytrix drummondii</i> (P3), <i>Comesperma acerosum</i> (P3), <i>Desmocladius elongatus</i> (P3), <i>Drosera marchantii</i> subsp <i>prophylla</i> (P1), <i>Eucalyptus pendens</i> (P4), <i>Gastrolobium axillare</i> (P3), <i>Grevillea rudis</i> (P4), <i>Hakea longiflora</i> (P3), <i>Hakea neurophylla</i> (P4), <i>Hensmania stoniella</i> (P3), <i>Hypocalymma tenuatum</i> (P2), <i>Jacksonia anthoclada</i> (P3), <i>Lepidobolus quadratus</i> (P3), <i>Loxocarya gigas</i> (P2), <i>Olex scalariformis</i> (P3), <i>Stenanthemum reissekii</i> (P3), <i>Stylidium diuroides</i> subsp <i>paucifoliatum</i> (P4), <i>Stylidium inversiflorum</i> (P4), <i>Stylidium nonscandens</i> (P3), <i>Synaphea aephysynsa</i> (P3), <i>Synaphea endothrix</i> (P2), <i>Verticordia rutilastra</i> (P3).</p> <p>DEC, 2009</p>

<b>2.5. Reproduction</b> <b>Provide an overview of the breeding system.</b> <b>For <u>fauna</u>:</b> Provide an overview of the breeding system and breeding success, including: when does it breed; what conditions are needed for breeding; are there any breeding behaviours that may make it vulnerable to a threatening process? <b>For <u>flora</u>:</b> When does the species flower and set fruit? Is the seed produced viable? What conditions are needed for this? What is the pollinating mechanism? If the species is capable of vegetative reproduction, a description of how this occurs, the conditions needed and when. Does the species require a disturbance regime (e.g. fire, ground disturbance) in order to reproduce?
<i>Petrophile nivea</i> flowers from May to August. Reproduction is from seed which is produced after flowering.
<b>2.6. Population dynamics</b> <b>Provide details on ages of sexual maturity, extent of breeding success, life expectancy and natural mortality. Describe population structure (presence of juveniles/seedlings, mature and senescing individuals).</b>
Little is known about the age dynamics of the subpopulation, but there is evidence of senescence, mature individuals and seedlings.
<b>Questions 2.7 and 2.8 apply to <u>fauna</u> nominations only</b>
<b>2.7. Feeding</b> <b>Summarise food items or sources and timing/availability.</b>
N/A
<b>Briefly describe feeding behaviours, including those that may make the species vulnerable to a threatening processes.</b>
N/A
<b>2.8. Movements</b> <b>Describe any relevant daily or seasonal pattern of movement for the species, including relevant arrival/departure dates if migratory. Provide details of home range/territories.</b>
N/A
<b>SECTION 3. INTERNATIONAL CONTEXT</b>
<b>For species that are distributed both in <u>Australia</u> and in <u>other countries</u>.</b>
<b>3.1. Distribution</b> <b>Describe the global distribution.</b>
Endemic to Western Australia
<b>Provide an overview of the global population size, trends, threats and security of the species outside of Australia.</b>
N/A
<b>Explain the relationship between the Australian population and the global population. What percentage of the global population occurs in Australia? Is the Australian population distinct, geographically separate or does part, or all, of the population move in/out of Australia's jurisdiction? Do global threats affect the Australian population?</b>
N/A

SECTION 4. CONSERVATION STATUS AND MANAGEMENT																							
<b>4.1. Population</b> <b>What is the total population size in terms of number of mature individuals? Has there been any known reduction in the size of the population, or is this likely in the future? – provide details. Are there other useful measures of population size and what are they? Or if these are unavailable, provide an estimate of abundance (e.g. scarce, locally abundant etc).</b>																							
<p>The total subpopulation size of <i>Petrophile nivea</i> is 384 mature individuals, plus a total of 10 seedlings. The subpopulation has never been comprehensively surveyed until 2008 when Kathy Himbeck completed a flora survey of the remnant. The only other count was made by S. Patrick and L Polomka in 2001 who counted 10 mature individuals. The increase in number of individuals is therefore due to a more extensive survey in 2008.</p> <p>There has not been any known size reduction in the subpopulation and unless a natural disaster occurs, this subpopulation should remain at this size or potentially increase if more areas of the remnant are surveyed.</p> <p>(DEC, 2009)</p>																							
<b>Provide locations of: captive/propagated occurrences or <i>ex situ</i> collections; recent re-introductions to the wild; and sites for proposed re-introductions. Have these sites been identified in recovery plans?</b>																							
<p>There is no material from the <i>Petrophile nivea</i> subpopulation at Hi Vallee held at the DEC's Threatened Flora Seed Centre.</p> <p>(Pers Com: Anne Cochrane, 2009)</p>																							
<b>How many locations do you consider the species occurs in and why? Where a species is affected by more than one threatening event, location should be defined by considering the most serious plausible threat.</b>																							
<p><i>Petrophile nivea</i> is only known from one location. From previous surveys it was thought that there might be two subpopulations on the remnant, but with more intensive ground searches it was found that these two original locations that were separate by more than 500 m are actually linked by scattered individuals. Please see map attached.</p>																							
<b>For <u>flora</u>, and where applicable, for <u>fauna</u>, detail the location, land tenure, estimated number of individuals, area of occupancy, and condition of site for each known location or occurrence.</b>																							
<table border="1"> <thead> <tr> <th>Location</th> <th>Land status</th> <th>Date of most recent survey</th> <th>Number of individuals at location</th> <th>Area of occupancy at location</th> <th>Condition of site</th> </tr> </thead> <tbody> <tr> <td>1. Large patch of remnant vegetation on 'Hi Vallee' private property, off N side of Tootbardie Rd, SE of Warradarge</td> <td>Private</td> <td>25/3/08</td> <td>384</td> <td>86.8 ha</td> <td>Healthy</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>						Location	Land status	Date of most recent survey	Number of individuals at location	Area of occupancy at location	Condition of site	1. Large patch of remnant vegetation on 'Hi Vallee' private property, off N side of Tootbardie Rd, SE of Warradarge	Private	25/3/08	384	86.8 ha	Healthy						
Location	Land status	Date of most recent survey	Number of individuals at location	Area of occupancy at location	Condition of site																		
1. Large patch of remnant vegetation on 'Hi Vallee' private property, off N side of Tootbardie Rd, SE of Warradarge	Private	25/3/08	384	86.8 ha	Healthy																		
<b>Has the number of individuals been counted, or is this an estimate? Provide details of the method of determining the number of individuals.</b>																							

The individuals within the current boundary of the subpopulation have been counted using a hand held GPS unit.
<b>Has there been any known reduction in the number of locations, or is this likely in the future? – provide details.</b>
There has been no reduction in the subpopulation of <i>Petrophile nivea</i> , but with more extensive survey conducted in 2008, the two patches have now been linked to form a single subpopulation.
<b>What is the extent of occurrence (in km<sup>2</sup>) for the species; explain how it was calculated and datasets used. If an accurate estimate is unavailable, provide a range of values or a minimum or maximum area estimate. Include estimates of past, current and possible future extent of occurrence. If available, include data that indicates the percentage decline over 10 years or 3 generations (whichever is longer) that has occurred or is predicted to occur.</b>
<p>The area of occupancy of <i>Petrophile nivea</i> is estimated at 0.86km<sup>2</sup>. This figure was calculated using subpopulation boundary and individual location data collected in the field with a hand held GPS and data extrapolated from field notes and ‘mud maps’ using the program ArcGIS9. These calculations are regarded as an overestimate.</p> <p>(DEC, 2009)</p>
<b>Is the distribution of the species severely fragmented? Why?</b>
<i>Petrophile nivea</i> is only known from one subpopulation. This subpopulation appears to be continuous.
<b>Identify important occurrences necessary for the long-term survival and recovery of the species? This may include: key breeding populations, those near the edge of the range of the species or those needed to maintain genetic diversity.</b>
As there is only one known subpopulation of <i>Petrophile nivea</i> , it is considered to be extremely important for the long term survival of this species.
<b>4.2. Survey effort</b> <b>Describe the methods to conduct surveys. For example, (e.g. season, time of day, weather conditions); length, intensity and pattern of search effort (including where species not encountered); any limitations and expert requirements.</b>
Consultation with consultant botanists who have conducted many surveys in the area, indicate that surveys, general and specific for <i>Petrophile nivea</i> , have been conducted at varying times of the year and with varying intensities. Some surveys have been conducted opportunistically whilst conducting works on other species and others have been conducted in a more structured manner. Survey work has involved both desktop and field based assessments of potential habitat and likely areas of occurrence.

**Provide details on the distinctiveness and detectability of the species, or the distinctiveness of its habitat, that would assist survey success.**

*Petrophile nivea* is considered a distinctive species and can be easily identified from other coexisting *Petrophile* species by its pure white flowers, crowded leaves which largely conceal the surfaces of the branchlets and involucre bracts, long perianth hairs and small cones.

The preferred habitat of *Petrophile nivea* is also distinctive, growing in upland habitats with shallow sand over laterite.

**Has the species been reasonably well surveyed? Provide an overview of surveys to date (include surveys of known occurrences and surveys for additional occurrences) and the likelihood of its current known distribution and/or population size being its actual distribution and/or population size. Include comments on potential habitat and surveys that were conducted, but where the species was not present/found.**

*Petrophile nivea* was first collected in May 1999 by Mike Hislop from a large remnant on private property (Hi Vallee) and described in 2001 by Barbara Rye. This remains the only known subpopulation after several search efforts in the surrounding area

The owners of Hi Vallee, Don and Joy Williams, are avid and knowledgeable botanists with a keen interest in the high diversity of flora that exists on their remnant and in the surrounding landscape. They provide flora tours on their property and in nearby National Parks, Nature Reserves and UCL. Over the past 10 years they have spent many hours covering vast areas of Lesueur National Park, Coomallo Nature Reserve, Alexander Morrison National Park and Big Soak Plains (UCL), looking for *Petrophile nivea* but have been unsuccessful.

Over the last two years specific surveys have been conducted in habitat that is thought suitable for *Petrophile nivea*. These include:

- Traversing the length of Marchagee Track on foot from the Brand Highway to Coolara Road.
- Total of 30-40hrs searching along the Coolara Road, from the Marchagee Track south.
- Several hours searching in the Cowalla Rd locality on all sandy gravelly ridges, whilst conducting surveys for a proposed wind farm.
- Area of bushland at the corner of Marchagee Track and Mazza Road.
- Bushland part of the Heschell Range, north of Marchagee Track. Opposite McKays Road.
- 10hrs combined search in bushland at the corner of Marchagee Track and Dewar Rd
- Two people in October 2008 searched for 3-4hrs, covering an area of 8km in a large patch of remnant bushland south of the Marchagee Track and just west of Watheroo National Park.
- In September 2008 a group of 6 people search for two hours in a transect formation in a large patch of remnant bushland south of the Marchagee Track and just west of Watheroo National Park, taking a SE to NW alignment through the centre.

The habitat in *Petrophile nivea* is found is considered distinctive in its landform and associated species, this information has been used to identify suitable areas for survey.

Please see map attached for locations of these searches.  
(Pers. Com: Don Williams, 2009)

<b>4.3. Threats</b> <b>Identify past, current and future threats indicating whether they are actual or potential. For each threat describe:</b> <b>a). how and where they impact this species</b> <b>b). what the effect of the threat(s) has been so far (indicate whether it is known or suspected</b> <b>c). present supporting information/research</b> <b>d). does it only affect certain populations?</b> <b>e). what is its expected effect in the future (is there supporting research/information; is the threat only suspected; does it only affect certain populations?).</b>				
<p>As there is only a single known subpopulation of <i>Petrophile nivea</i> and it is located on a long unburnt remnant surrounded by agriculture land, there is a high risk that the entire subpopulation could be destroyed by a single fire event. As it is a <i>Petrophile</i>, regeneration from the existing seed bank is likely to occur following a fire, but then the seedlings are prone to grazing from rabbits.</p>				
<b>If possible, provide information threats for each occurrence/location:</b>				
<b>Location</b>	<b>Past threats</b>	<b>Current threats</b>	<b>Potential threats</b>	<b>Management requirements (see section 4.4)</b>
Subpopulation 1 <i>Private property</i>	Clearing	Fire	Clearing, fire, rabbits	Potential threats may occur with changes in land manager and other unforeseen events.
<b>Identify and explain why additional biological characteristics particular to the species are threatening to its survival (e.g. low genetic diversity). Identify and explain any models addressing the survival of the species.</b>				
N/A				
<b>4.4. Management</b> <b>Identify key management documentation for the species e.g. recovery plans, conservation plans, threat abatement plans etc.</b>				
<p>There has been Biodiversity Management Plans written for the Hi Vallee remnant, but this is a broad document, with the aim of managing the remnant as a whole. No specific management documentation has been prepared for <i>Petrophile nivea</i>. It should also be noted that the current land owners/managers are very conservation orientated.</p>				
<b>Does this species benefit from the management of another species or community? Explain.</b>				
<p>The subpopulation of <i>Petrophile nivea</i> occurs on a private remnant that contains other DRF and Priority species. These populations will benefit from the ongoing management of their associated species of DRF.</p>				
<b>How well is the species represented in conservation reserves or covenanted land? Which of these are actively managed for this species? Provide details.</b>				
<p>The only known subpopulation of <i>Petrophile nivea</i> occurs on a private remnant that has no covenant over it.</p>				
<b>Are there any management or research recommendations that will assist in the conservation of the species? Provide details.</b>				



<p>Management recommendations include:</p> <ul style="list-style-type: none"> <li>• Liaison with private property owners to ensure protection of remnant vegetation;</li> <li>• Protecting the sites from fire unless required for ecological reasons, and implemented early intervention in any wildfires which may threaten the site;</li> <li>• Monitoring the subpopulation for evidence of weed and rabbit impacts, or changes in plant or site health;</li> <li>• Surveying for additional subpopulations;</li> <li>• Collect and store seed to guard against the extinction of the natural sub-population. Collections should aim to sample and preserve the maximum range of genetic diversity possible;</li> <li>• Develop and implement a fire management strategy, including associated weed control measures and the need for and method of the construction and maintenance of firebreak;</li> <li>• Control rabbits if required;</li> <li>• Develop a translocation proposal and select a disease free translocation site;</li> <li>• Map habitat critical to the survival of the species to facilitate its protection and appropriate management;</li> <li>• Investigate formal conservation arrangement, management agreement and covenant on private land, and investigate inclusion in reserve tenure if possible;</li> <li>• Promote awareness of the species with general public;</li> <li>• Research biology and ecology of the species, with a focus on pollination effectiveness, seed viability, conditions required for natural germination, response to threats and disturbances and reproductive biology.</li> </ul>													
<p><b>4.5. Other</b>  <b>Is there any additional information that is relevant to consideration of the conservation status of this species?</b></p>													
<p><b>SECTION 5. NOMINATOR</b></p> <table border="1"> <tr> <td><b>Nominator(s) name(s)</b></td> <td></td> </tr> <tr> <td><b>Organisation(s)</b></td> <td></td> </tr> <tr> <td><b>Address(s)</b></td> <td></td> </tr> <tr> <td><b>Telephone number(s)</b></td> <td></td> </tr> <tr> <td><b>Email(s)</b></td> <td></td> </tr> <tr> <td><b>Date</b></td> <td>26<sup>th</sup> March 2009</td> </tr> </table>		<b>Nominator(s) name(s)</b>		<b>Organisation(s)</b>		<b>Address(s)</b>		<b>Telephone number(s)</b>		<b>Email(s)</b>		<b>Date</b>	26 <sup>th</sup> March 2009
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<b>Date</b>	26 <sup>th</sup> March 2009												
<p><b>If the nomination has been refereed or reviewed by experts, provide their names and contact details.</b></p>													
<p><b>SECTION 6. REFERENCES</b></p> <p><b>What references or sources did you use to prepare your nomination? Include written material, electronic sources and verbal information. Include full references, address of web pages and the names and contact details of authorities with whom you had verbal communications.</b></p>													

Western Australian Herbarium (2009). Florabase – The Western Australian Flora. Department of Environment and Conservation. <http://florabase.calm.wa.gov.au>

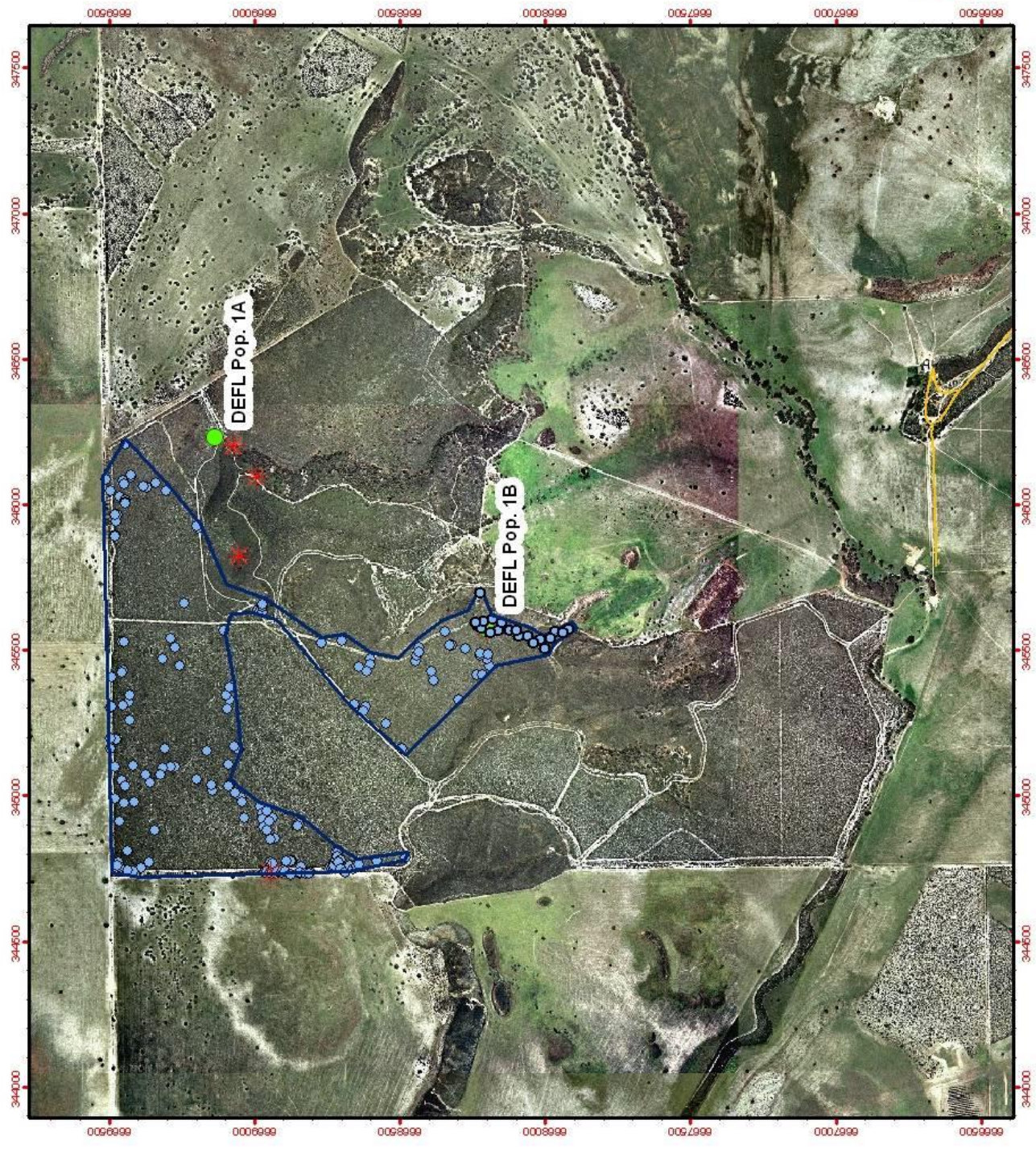
DEC (2009) Records held in Department of Environment and Conservation's Threatened Flora Database and associated files. WA Department of Environment and Conservation.

M. Hislop & B. L. Rye (2002) Three new early-flowering species of *Petrophile* (Proteaceae) from south-western Australia, Nuytsia Vol. 14 (3):365-374.

Personal Communication, Don Williams (private property owner, Hi Vallee farm)

Personal Communication, Anne Cochrane (DEC, Threatened Flora Seed Centre)





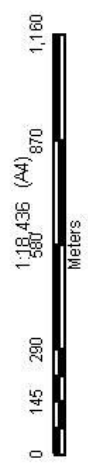
**Petrophile nivea**

**Priority 1**

**DEFL Pop 1**

**Partial survey**

- \* WA\_Herb\_20090218
- Moorra\_DEFL\_20090218shp
- △ Estimated area of occurrence



Projection: Universal Transverse Mercator  
MGA Zone 50. Datum: GDA94

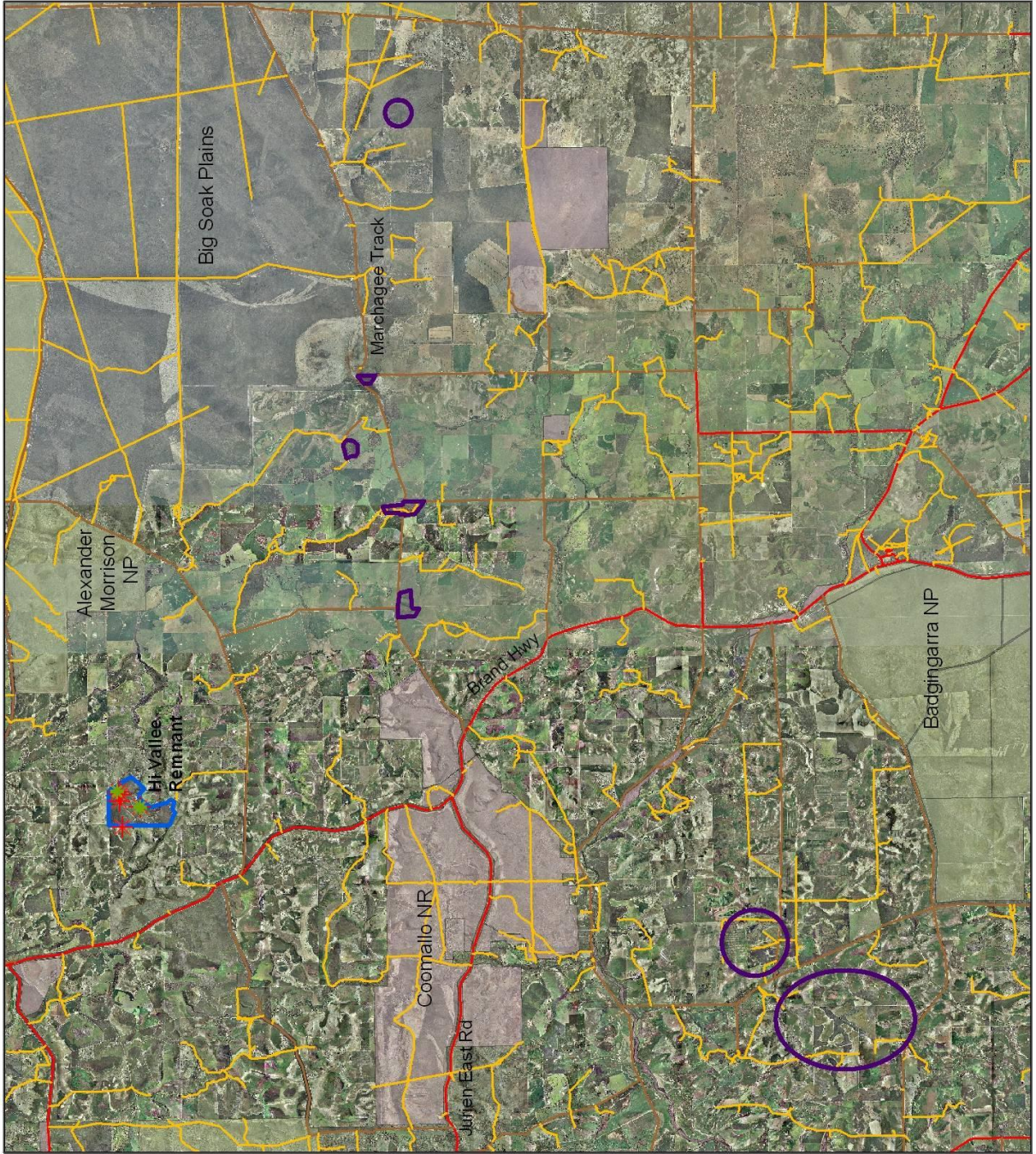


 **Department of Environment and Conservation**  
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Produced by Kathy Himbeck  
Under the Direction of  
Kerlan McKinnon  
Director General, Department of  
Environment and Conservation

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Job Ref: Ht Valley, Produced at 15:50pm, on March 25, 2009





# Petrophile nivea

## Partial survey

Combined: 1434 plants,  
74 points

- WA\_Herb\_20090218
- Moorra\_DEFL\_20090218shp
- Area Searched
- Hi\_Vallee\_boundary



Projection: Universal Transverse Mercator  
MGA Zone 50. Datum: GDA94



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