NATIONAL RECOVERY PLAN FOR *Pomaderris cotoneaster* (Cotoneaster Pomaderris)

Australian Government

State Government Victoria

Department of Sustainability and Environment

NSW Government

Environment, Climate Change & Water

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DISCLAIMER

The attainment of objectives and the provision of funds may be subject to budgetary and other constraints affecting the parties involved, and may also be constrained by the need to address other conservation priorities. Approved recovery actions may be subject to modifications due to changes in knowledge and changes in conservation status.

Summary

This document constitutes the formal National Recovery Plan for *Pomaderris cotoneaster* (Cotoneaster Pomaderris). The plan considers the conservation requirements of the species across its known range, identifies the actions to be taken to ensure its long-term viability in nature and the parties who will undertake these actions.

Pomaderris cotoneaster is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, Endangered (Schedule 1, Part 1) under the NSW *Threatened Species Conservation Act 1995*, and Threatened (Schedule 2) under the Victorian *Flora and Fauna Guarantee Act 1988*.

Pomaderris cotoneaster is a medium-sized shrub in the family Rhamnaceae. It occurs from Yerranderie west of Sydney to far eastern Victoria. Twelve populations of *Pomaderris cotoneaster* have been recorded; 11 in NSW and one in Victoria. The precise locations of nine of these are known.

The overall objective of this plan is to ensure that all populations of *Pomaderris cotoneaster* are stable or increasing in size, by reducing or managing threats, increasing knowledge of the genetic diversity and response to disturbance of this species, supplementary planting and promoting recruitment wherever possible.

These objectives will be achieved through the following recovery actions:

1. Conducting further survey
2. Determining habitat critical to the survival of *Pomaderris cotoneaster* and monitoring known populations
3. Removing threatening weeds
4. Erecting a protective barrier at Badgerys Lookout
5. Enhancing populations where practicable
6. Investigating genetic diversity
7. Obtaining management agreements for populations on non-reserve tenure
8. Providing information to affected parties
9. Ensuring adequate data management
10. Co-ordinating recovery actions

The recovery plan will be considered successful if populations at all sites have remained stable or have increased in size over a five year period.

Abbreviations used in this Plan

DECCW	Department of Environment, Climate Change and Water, New South Wales
DSE	Department of Sustainability and Environment, Victoria
EPBC Act	*Environment Protection and Biodiversity Act 1999* (Commonwealth)
FFG Act	*Flora and Fauna Guarantee Act 1988* (Victoria)
IUCN	International Union for the Conservation of Nature
PV	Parks Victoria
TSC Act	*Threatened Species Conservation Act 1995* (NSW)

SPECIES INFORMATION AND GENERAL REQUIREMENTS

Description and Taxonomy

Pomaderris cotoneaster N. A. Wakefield (Rhamnaceae) is an erect shrub to 4 m tall. Young stems have a short whitish stellate tomentum. Leaves are elliptic, mostly 15-30 mm long and 10-15 mm wide. The leaf apex is obtuse to emarginate (i.e. sometimes indented thus resembling the horticultural cotoneaster, to which it is not related). The upper surface of the leaf is generally bristly, with hairs scattered to very sparse; at least some hairs are stellate. The lower surface has a fine white mat of loose stellate hairs. Secondary veins are impressed on the upper leaf surface and strongly raised on the lower surface. Flowers are cream-coloured and occur in short leafy panicles. Petals are absent. The hypanthium, sepals and ovary occur with long simple whitish hairs (Harden, 1990).

This species is similar to *P. prunifolia* but differs in having broader leaves that are more sparsely and finely hairy above and more softly and finely hairy below, with few, if any, rusty hairs (Walsh 1999).

Distribution and habitat

Pomaderris cotoneaster occurs in south-eastern Australia, from Yerranderie in the Blue Mountains west of Sydney to far eastern Victoria (Fig. 1). In total, 12 populations have been recorded, although only nine of these have been confirmed as extant in the last decade. The total number of plants known to exist in the wild is approximately 2,000, although accurate population counts have not been made for all known populations. The species has been recorded from five reserves: South East Forests National Park (three populations); Morton National Park (two populations); Kosciuszko National Park (one population), Bungonia State Conservation Area (two populations); Coopracambra National Park (one population).

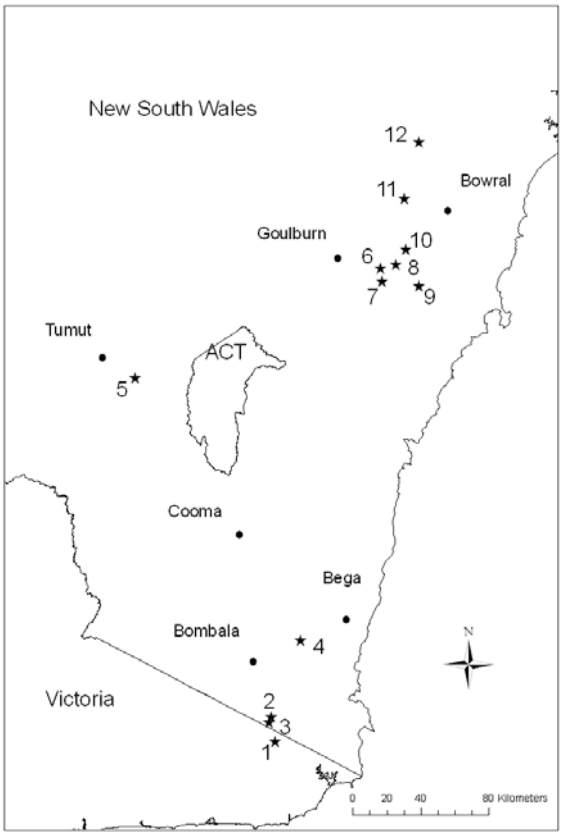

Fig. 1. Locations of the 12 *Pomaderris cotoneaster* populations. Populations are numbered and information provided on each in Table 1. The locations of populations 6, 9 and 10 are approximate.

Pomaderris cotoneaster grows in a wide range of habitats (Table 1). Some populations (Genoa River and its tributaries, Tantawangalo Creek and Bungonia (Balchams Gully)) are largely riparian. Plants there may occur in the stream zone (often amongst rock) or at the bases of often steep slopes. In Kosciuszko National Park, the population extends from the river flat to the upper slopes above the Goobragandra River in low dry sclerophyll forest. At Bungonia (above Jerrara Creek) and Badgerys Lookout, the populations are on steep slopes near the sandstone escarpment, in dry forest. The Canyonleigh population differs from other known populations in being on a fairly flat ridge top (but near the edge of the sandstone escarpment). Habitats at the Black Range, Ettrema Gorge and Yerranderie populations are unknown.

Legal Status

Pomaderris cotoneaster is listed as Endangered under the EPBC Act, Endangered (Schedule 1, Part 1) under the NSW TSC Act and Threatened (Schedule 2) under the Victorian FFG Act.

International obligations

The species is not listed under International agreements. However, this plan is consistent with the aims and recommendations of the Convention on Biological Diversity, which has been ratified by Australia, and will assist in meeting Australia's responsibilities under that convention.

Role and interests of indigenous people

Local Aboriginal Land Councils were consulted in the preparation of this plan. At the time of publication no role or interest of indigenous people had been identified for this species. Indigenous communities will be invited to participate in the implementation of the Recovery Plan.

Habitat critical to the survival of the species

Given the small number of extant populations and the low population size at most sites, all populations and the habitat they occupy are critical to the survival of *Pomaderris cotoneaster*. These areas have not been defined spatially. An action to define habitat critical to survival is included below.

Biodiversity Benefits

The preparation and long term implementation of Recovery Plans for threatened species, populations and ecological communities, contributes to, and highlights the importance of, conserving biodiversity. The conservation of biodiversity has a number of wider community benefits. These include providing and maintaining a range of ecosystem processes and contributing to increased ecological knowledge of species, habitats and broader ecosystems.

The appropriate management of the habitat of *P. cotoneaster* will contribute to the conservation of *Correa lawrenceana* var. *genoensis* (endangered, EPBC Act), with which it occurs at one site (Redstone Creek), and to populations of *Solanum celatum* (endangered, TSC Act) at Bungonia (above Jerrara Creek) with which it occurs in close proximity and in similar habitat. Conservation actions that retain habitat quality or permit habitat recovery for *P. cotoneaster* will also benefit a wide range of threatened fauna species that occur in its vicinity, e.g. *Ninox strenua* (Powerful Owl), *Tyto novaehollandiae* (Masked Owl). *Miniopterus schreibersii oceanensis* (Eastern Bent-Winged Bat), *Petaurus australis* (Yellow-bellied Glider) and *Petrogale penicillata* (Brush–tailed Rock-wallaby).

Table 1. Summary of population information and threats

Location	Land Tenure	Habitat	Associated species	Pop. size / time of last census	Threats
1. Genoa River, VIC	National Park (Coopracambra)	Riparian habitat; elevation c. 160 m	Not recorded	1 (2002)	Too frequent fire, small population size
2. Neenah Gorge, NSW	National Park (South East Forests)	On steep slope at base of sandstone cliff; elevation 520 m	Tall open forest of *Eucalyptus cypellocarpa, E. fastigata, E. smithii, Pomaderris aspera*	68 (1999)	Too frequent fire
3. Redstone Creek, NSW	National Park (South East Forests)	Alluvial rocky terrace within flood zone of creek; elevation 370 m	*Eucalyptus cypellocarpa, E. elata, E. macrorhyncha, E. muelleriana, E. obliqua*	22 (1999)	Too frequent fire, erosion of alluvial terraces, browsing by wallabies, weeds
4. Tantawangalo Creek, NSW	National Park (South East Forests), Council land, freehold	Streamline amongst granitic boulders and adjoining forest; elevation 300 - 450 m	Open forest of *Eucalyptus elata, E. globoidea, E. globulus* ssp. *maidenii*	c. 250 (1999)	Too frequent fire, browsing by wallabies, competition from riparian weeds (willow), damage by insect pathogens
5. Goobragandra River, NSW	National Park (Kosciuszko)	River bank and slopes above with a westerly aspect; elevation 390 - 450 m	Forest of *Eucalyptus dalrympleana, E. radiata, E. viminalis*	c. 1000 (2004)	Too frequent fire, competition from riparian weeds (blackberry, poplar, willow)
6. Bungonia (Balchams Gully), NSW	State Conservation Area	Stream bank	Adjoining woodland of *Eucalyptus dives* and *E. macrorhyncha*.	105 (2007)	Too frequent fire, small population size, stochastic disturbance events
7. Bungonia (above Jerrara Creek), NSW	State Conservation Area	Above sandstone escarpment; elevation 580 m	Shrubby woodland of *Eucalyptus bosistoana, E. macrorhyncha*	150 (2007)	
8. Badgerys Lookout, NSW	National Park (Morton), Council land	Narrow gully between sandstone cliffs; elevation 520 - 590 m	Adjoining *Eucalyptus agglomerata / E. punctata* forest.	c. 300 (2000)	Too frequent fire, goat browsing, rubbish dumping, bushwalker trampling
9. Ettrema Gorge, NSW	National Park (Morton)	Unknown	Unknown	unknown (herbarium collection 1987)	Too frequent fire
11. Black Range, Wingello, NSW	Unknown	Unknown	Unknown	unknown (herbarium collection 1939)	Unknown
10. Canyonleigh, NSW	Freehold, Road Reserve, power easement	Shrubby forest at top of narrow ridge near escarpment edge; elevation 730 m	*Eucalyptus agglomerata, E. punctata*	c. 150 (2005)	Illegal or accidental clearing
12. Yerranderie, NSW	Unknown	Unknown	Unknown	unknown (herbarium collection 1915)	Unknown

Social and economic impacts

As most populations of *P. cotoneaster* occur in conservation reserves, the implementation of this Recovery Plan is not expected to cause significant adverse social or economic impacts. The cost of implementation will be offset by the social benefit of preventing further loss in biodiversity and the potential cost of recovery should this species become close to extinction. Actions on public land are consistent with current land management practices identified for such land.

Plan review and evaluation

DECCW in consultation with the DSE will evaluate the performance of the recovery plan against the criteria identified below. The Plan will be formally reviewed within five years from the date of its adoption under the EPBC Act.

Biology and ecology

Flowering of *P. cotoneaster* occurs between October and November (Walsh 1999). Fruits mature in summer with seed being released predominantly in late January and early February. The time from recruitment to first flowering and the longevity of plants is unknown.

The response of the species to fire is not documented but many *Pomaderris* species are fire-sensitive. The occurrence of most populations in steep gullies or along creeks suggests that *P. cotoneaster* is also fire-sensitive and has persisted only where fire has been infrequent with long intervals between fires. However, the structure of populations is not especially typical of a fire-sensitive obligate seeder. For instance, although most plants at Badgerys Lookout are between 1.25 m and 2.25 m in height, some are very short and some very tall (Fig. 2). This suggests either continuous recruitment, where new recruits gradually replace senescent adults, or partial population destruction by fire, where some plants have survived fires but fire has facilitated the recruitment of a new cohort. The occurrence of two peaks in the population structure at Badgerys Lookout (1-1.25 and 2-2.25 m in height) supports the latter hypothesis. Juveniles can be found in most populations even where no fire has been recorded in recent times. This indicates that the species is not reliant on fire for regeneration.

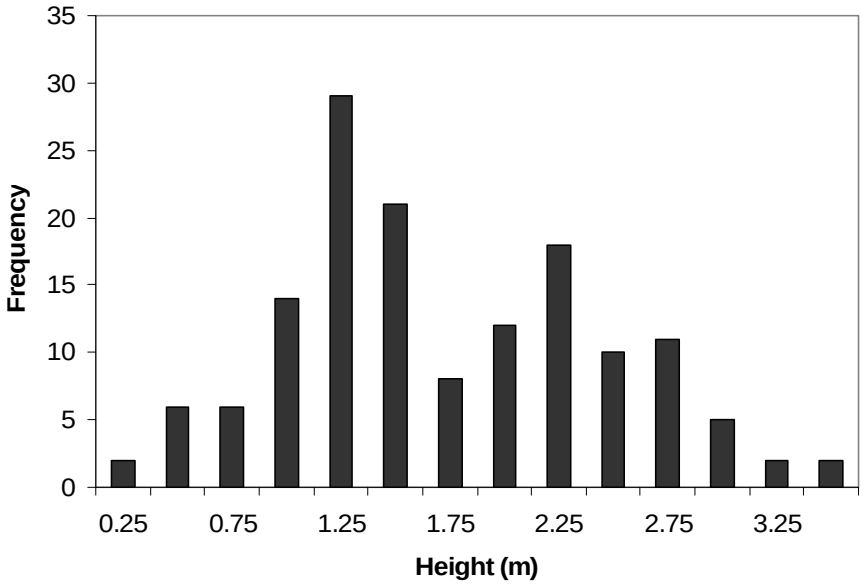

Fig. 2. Height distribution of *Pomaderris cotoneaster* population at Badgerys Lookout (Morton National Park); *n* = 122.

Threats

The identified threats to *P. cotoneaster* are climate change, macropod browsing, insect pathogens, rubbish dumping, fire, competition from weeds, low population numbers, clearing, stochastic disturbance events, bushwalker trampling, erosion and goat browsing. Of these, fire is probably the most significant and immediate.

Climate change. The populations surveyed by Carr (1999) were found to be affected by drought with substantial amounts of the upper canopy having died. However, plants were found to re-sprout from the stem following death of the crown. More frequent drought, one of the modelled predictions of future climate for south-eastern Australia, could limit the capacity of *P. cotoneaster* plants to regenerate from single drought events.

Herbivore browsing. Some plants observed by Carr (1999) had been severely browsed, with locally common Swamp Wallabies assumed to be responsible. No apparent death of plants had obviously been caused by browsing but recruitment, flowering and seed production may be inhibited by browsing. Goats are locally common in the Badgerys Lookout and Bungonia area. Their impact on *P. cotoneaster* is uncertain.

Insect pathogens. Larger plants in the Tantawangalo population were observed by Carr (1999) to show severe effects of borers (the damage presumed to have been caused by larvae of beetles and or moths). In some cases borers had tunnelled under the bark, while in others a substantial part of the core of the stem had been lost. Borers were assumed to have been a major contributing cause of death or partial death. In all populations observed by Carr (1999) leaves had damage from phytophagus insects, including holes in leaves and partial or complete removal of leaves.

Fire. Pomaderris cotoneaster grows in a wide range of habitats but is found in isolated patches. Most populations are in areas that are most likely to have escaped wildfire (e.g. riparian areas and narrow gullies). Some rare *Pomaderris* species have been found to have a minimal soil seed store (Millot 2003), which will reduce the capacity of these species to regenerate after a fire that removes the adult cohort. Until the response of *P. cotoneaster* to fire is understood, the species should be assumed to be intolerant of fire. At this stage there is no need to protect populations from wildfire – these will ultimately provide an opportunity to understand its fire response – but prescribed fire should be avoided wherever possible.

Rubbish dumping. The population at Badgery's Lookout is located in a steep gully below a car park, separated by a flimsy wire fence. It is possible that car bodies will be deposited into the gully resulting in a major disturbance of the *P. cotoneaster* population.

Low numbers. The low numbers of *P. cotoneaster* at some sites make the populations more vulnerable to the effects of chance catastrophic events. In the long term, loss of genetic variation may threaten the evolutionary potential of *P. cotoneaster* and reduce its ability to respond to alterations in its environment, including climate change.

Weeds. Minor occurrences of willow, poplar and blackberries have been recorded in *P. cotoneaster* populations (Carr 1999, Miles 2004). At present the threat is low but all of these weed species are capable of dominating the riparian habitat where some populations are found.

Clearing. Complete removal of plants is a threat to the Canyonleigh population, which is partly on road reserve, freehold land and a power easement. The boundaries between these tenures are not defined by fences and some clearing has already occurred.

Erosion. Erosion of alluvial terraces containing *P. cotoneaster* plants was noted as a threat in the Redstone Creek population (Carr 1999). It is possible, however, that erosion of terraces associated with flooding could create new habitat for recruitment of new plants and may not be a threat – species that grow in such environments are presumably adapted to the natural disturbances that operate there.

Bushwalker trampling. A walking track at Badgerys Lookout passes through the middle of the *P. cotoneaster* population. It will not be possible to move the track because of the steep terrain but the track is rarely used and there is currently only localised damage from trampling.

Guidance for Environmental Assessment

Although this recovery plan cannot prescribe decision-making under Commonwealth or State environmental legislation, it is clear from the review conducted as the basis for this plan that all populations are critical to the long-term survival of the species. Environmental assessment for development or prescribed burning should therefore conclude that no net loss of populations or individuals is acceptable.

Management practices which are required to avoid a significant impact on *P. cotoneaster* include: implementation of the management plans for South East Forests, Morton, Kosciuszko and Coopracambra National Parks, and the Fire Management Strategy for South East Forests National Park; continued management of Bungonia State Conservation Area; and continuation of voluntary conservation management schemes.

To avoid significant impacts on the species, any management practices or other activities should avoid all of the following within habitat critical to the survival of *P. cotoneaster*:

- prescribed burning;
- increase in competition from weeds;
- rubbish dumping;
- increase in grazing or browsing;
- increase in human traffic
- compaction or erosion of soil or disturbing soil surface;
- removal of vegetation;
- removal or destruction of *P. cotoneaster* plants; and
- damage to *P. cotoneaster* plants.

RECOVERY OBJECTIVES AND CRITERIA

Objectives

Over the life of this Recovery Plan:

a. to ensure that all natural populations of *Pomaderris cotoneaster* are stable or increasing in size

b. to reduce or manage threats

c. to increase knowledge of the reproductive biology of this species

d. to undertake supplementary planting of this species and promote its recruitment wherever possible

Performance Criteria

Over the life of this Recovery Plan:

a. all populations have remained stable or have increased in size

b. knowledge of the reproductive biology of the species has been increased

c. supplementary planting of the species has been undertaken

RECOVERY ACTIONS

Previous Recovery Actions

Survey. Targeted surveys for *Pomaderris cotoneaster* in South East Forests NP (Carr 1999, Miles 2004), Bungonia State Conservation Area (Miles 2007) and in Kosciuszko NP (Miles 2004) were funded by the NSW National Parks and Wildlife Service. Ad hoc monitoring of the Badgerys Lookout population has been conducted by NPWS / DECCW since 1998. An attempt to relocate the "Black Range, Wingello" population was unsuccessful – this location name does not appear on current maps and is not known by people living in the Wingello area. Several searches for *P. cotoneaster* have been made along the Genoa River by DSE and the National Herbarium of Victoria during the past decade (Neville Walsh, NHV, pers. comm.).

Reserve Management Plans. Plans of Management have been prepared for NSW populations in Morton National Park, Kosciuszko National Park, South East Forests National Park and Egan Peaks Nature Reserve - http://www.environment.nsw.gov.au/parkmanagement/ParkManagementPlans.htm, and the Victorian population in Coopracambra National Park - http://www.parkweb.vic.gov.au/1park_display.cfm?park=96. All of these Plans aim to protect threatened species populations through measures including:

- encouraging surveys and monitoring of threatened species to improve knowledge of their management requirements
- managing threatened species in accordance with approved Action Statements and Recovery Plans
- applying fire frequencies, where possible, that are consistent with the requirements of vegetation and threatened species
- establishing a program to monitor key sites that will improve knowledge of the response of different vegetation types to the 1983 wildfires

The draft Fire Management Strategy for South East Forests National Park and Egan Peaks Nature Reserve (http://www.environment.nsw.gov.au/firemanagement/SouthEastForestNPFmsDraft.htm) recommends a fire regime for localised populations of significant plant species that is similar to the surrounding vegetation group. Application of the Strategy will nevertheless consider the recorded locations of threatened species by reference to the relevant GIS database and will adopt fire

management strategies that minimise threats to these species. The potential sensitivity of *P. cotoneaster* is recognised in the draft Fire Management Strategy for Kosciuszko National Park (http://www.environment.nsw.gov.au/firemanagement/KosciuszkoNpFMS.htm).

Proposed recovery actions

1. Conduct further survey

Systematic survey for *P. cotoneaster* has been undertaken along the Genoa River and its tributaries (populations 1, 2 and 3), Tantawangalo Creek (population 4) and the Goobragandra River (population 5). Whilst further populations may be found in these areas, much survey effort would be required in remote country for possibly no gain. Priority will be given to survey in the Bungonia / Badgerys Lookout areas (where several populations occur in close proximity) and Canyonleigh (where *P. cotoneaster* was only recently discovered). There will also be some attempt to relocate populations at Yerranderie and Ettrema Gorge, although in both cases the potential search area is enormous and in the case of Ettrema Gorge, most of the vegetation has been recently burnt.

Responsibility: DECCW (with possible assistance from the Rhamnaceae study group of the Australian Native Plant Society)

Cost: $25,000

2. Determine habitat critical to the survival of *Pomaderris cotoneaster* and monitor populations

Systematic monitoring of all populations is required to assess the effectiveness of management actions in stabilising or increasing populations and to measure the effectiveness of supplementary planting (see Action 5). Permanent plots will be set up in populations 4, 5, 6, 7 and 8 to enable long-term monitoring of recovery in the event of wildfire and assist in determining the impacts of herbivory and pathogen attack. A general census, location of area of occupancy, and evaluation of threats will be made of all populations once every five years commencing in the first year of the plan. In the first year of this action, habitat critical to the survival of the species will be defined and added to relevant GIS layers.

Responsibility: DECCW and DSE

Cost: $45,000

3. Remove threatening weeds

Although weeds are currently rare in *P. cotoneaster* populations, blackberry, poplar and willows are locally present in some riparian sites and may pose a threat because of their disruptive nature. To reduce the future threat of weeds, all plants of blackberry, poplar and willow (and other woody weeds) within 500 m of riparian *P. cotoneaster* populations will be removed. Threatening weeds further upstream will be controlled if practicable. Weed regeneration will be checked in the following year (and every two years subsequently) and removed.

Responsibility: DECCW

Cost: $10,000

4. Erect a barrier at Badgerys Lookout

The population at Badgerys Lookout occurs below a car park for a little-used lookout. Rubbish and cars are often dumped at sites in the vicinity. The threat from these activities to the *P. cotoneaster* population could be greatly reduced if a hard barrier were constructed at the edge of the car park. The car park is managed by Goulburn-Mulwaree Shire Council whilst most or all of the *P. cotoneaster* population is in Morton National Park. The boundary between the two tenures is uncertain. Prior to

construction, it will be necessary to determine the tenure of the land where the barrier will need to be placed.

Responsibility: DECCW (in liaison with Goulburn-Mulwaree Shire Council)

Cost: $5000

5. Population enhancement

Although five populations contain hundreds to one thousand plants, all but one population (including those with < 100 plants) occupy small areas. The risk of local extinction from stochastic events is high. The enhancement of populations has the potential to lessen the probability of population loss for *P. cotoneaster*. Such planting will be difficult to establish and maintain in remote sites (i.e. populations 1, 2 & 3) but may be desirable in and near population 1 (Genoa River), which has only one known plant. The feasibility and desirability of enhancement planting for population 1 will be investigated following the next census (Action 2) and the investigation of genetic diversity (Action 6). Opportunities for the creation of new, secure sub-populations will be investigated for population 10 (Canyonleigh), which is on freehold land, road reserve and powerline easement but very close to Mt Penang Nature Reserve, and for population 5 (Kosciuszko National Park), where there is a single, highly disjunct population. The creation of new sub-populations will be carried out if practicable (following the guidelines in Vallee et al. 2004) and permissible. The Rhamnaceae study group of the Australian Native Plant Society has expressed interest in participating in this Action.

Responsibility: DECCW and DSE (with possible assistance from the Rhamnaceae study group of the Australian Native Plant Society). The conduct of this action will depend on the results of genetic studies (Action 6), monitoring (Action 2) and further surveys (Action 1).

Cost: $30,000

6. Investigate genetic diversity

Enhancement plantings and the creation of new sub-populations will be based on a study of the genetic characteristics of the known populations. This will be particularly important for populations in the Genoa River catchment where plant numbers are low. Enhancement planting in population 1 would probably require propagation from material in populations 2 or 3. Material for genetic testing will be collected during the census conducted in the first year of the plan. The cost is partly dependent on the availability of micro-satellite genetic markers at the time of testing.

Responsibility: DECCW and DSE

Cost: $25,000

7. Obtain management agreements for populations on non-reserve tenure

Parts or all of populations 4 (Tantawangalo Creek) and 10 (Canyonleigh) and possibly 8 (Badgerys Lookout) occur on freehold and/or land managed by local government. Further protection such as that provided by Joint Management Agreements and Voluntary Conservation Agreements will be sought to ensure long-term viability of these populations. It will be necessary first to clarify the tenure of the land at all of these sites.

Responsibility: DECCW

Cost: $10,000

8. Provide information to affected parties

Signs will be erected at populations 8 and 10 notifying vehicle operators, fire authorities and other land managers of the presence of an endangered species and requesting that they contact the designated individual or management authority before proceeding with any activity which may impact upon the site. Information will be circulated to all authorities with a potential interest in site

management.

Responsibility: DECCW (in liaison with Goulburn-Mulwaree and Wingecarribee Shire Councils)

Cost: to be met within existing budgets

9. Ensure adequate data management

It is important that relevant State and Commonwealth databases contain accurate records of *P. cotoneaster* as they are a primary resource for government and non-government agencies, researchers, developers, environmental consultants and land managers. DECCW and DSE will ensure that all *P. cotoneaster* records received are entered onto the relevant State and Commonwealth databases, i.e. the Atlas of NSW Wildlife, Victorian Flora Information System and the Commonwealth Species Profile and Threats Database

Responsibility: DECCW and DSE

Cost: to be met within existing budgets

10. Co-ordinate recovery actions

DECCW will co-ordinate the implementation of the recovery actions identified for *P. cotoneaster*.

Responsibility: DECCW

Cost: to be met within existing budgets

Summary of costs and actions identified in the Recovery Plan

Action No.	Action Title	Cost Estimate ($1000s/year)					Total Cost ($)	Responsible Party	Priority[1]
		Year 1	Year 2	Year 3	Year 4	Year 5			
1	Conduct further survey	7.5	7.5	5	5		**25**	DECCW	2
2	Determine habitat critical to survival / monitor populations	15	7.5	7.5	7.5	7.5	**45**	DECCW, DSE	1
3	Remove threatening weeds		5		5		**10**	DECCW	1
4	Erect barrier at Badgerys Lookout		5				**5**	DECCW	1
5	Enhance populations where practicable			10	10	10	**30**	DECCW, DSE	3
6	Investigate genetic diversity		25				**25**	DECCW, DSE	2
7	Obtain management agreements for populations on non-reserve tenure	5	5				**10**	DECCW	1
8	Provide information to affected parties	a					**a**	DECCW	1
9	Ensure adequate data management	a					**a**	DECCW, DSE	1
10	Co-ordinate recovery actions	a	a	a	a	a	**a**	DECCW	1
Total		**27.5**	**55**	**22.5**	**27.5**	**17.5**	**150,000**		

a: Minimal cost will be borne by agencies in their normal operating budgets.

[1] Priority is assigned from 1 (highest) to 3 (lowest)

Affected Interests

Stakeholders and those involved in implementing the plan include:

- NSW DECCW;
- Vic DSE;
- the National Herbarium of Victoria;
- Bega Valley Shire Council;
- the Rhamnaceae Study Group of the Australian Native Plant Society;
- private landholders;
- Goulburn-Mulwaree Shire Council; and
- Wingecarribee Shire Council.

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