Approved NSW & National
Recovery Plan

Davidsonia johnsonii
(Smooth Davidsonia)

December 2004

Department of
Environment and Conservation (NSW)

Queensland
Government
Environmental
Protection Agency
Queensland **Parks**
and Wildlife Service

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Recovery Plan for *Davidsonia johnsonii* (Smooth Davidsonia)

Foreword

This document constitutes the formal NSW State and National Recovery Plan for *Davidsonia johnsonii* (Smooth Davidsonia) and, as such, considers the conservation requirements of the species across its known range. It identifies the actions to be taken to ensure the long-term viability of this species in nature and the parties who will undertake these actions.

The Smooth Davidsonia is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999, the NSW *Threatened Species Conservation Act* 1995 and the Queensland *Nature Conservation (Wildlife) Regulation* 1994. The Smooth Davidsonia is a medium-sized rainforest tree, with a dense glossy crown and dark red plum-like fruit. The species is known from north-eastern NSW and south-eastern Queensland. The species has been recorded from nature reserves, road reserves and freehold land in NSW, whilst populations in Queensland have been recorded from freehold land only.

The future recovery actions detailed in this Recovery Plan include: (i) co-ordination of the implementation of this Recovery Plan; (ii) determining the size and extent of the population; (iii) gaining a better understanding of the biology and genetics of the Smooth Davidsonia; (iv) managing and protecting the population and associated habitat; (v) gaining an understanding of the cultural importance of the Smooth Davidsonia to Local Aboriginal Land Councils, Elders and other groups representing indigenous people, (vi) expanding the population size of the Smooth Davidsonia; and (vii) developing a contingency plan to ensure the long-term survival of the species.

It is intended that the Recovery Plan will be implemented over a five year period. Actions will be undertaken by the DEC with potential contribution from other state and local agencies.

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1 Introduction

Davidsonia johnsonii Harden & Williams (Smooth Davidsonia) is a medium-sized rainforest tree, with a distribution restricted to north-eastern New South Wales (NSW) and south-eastern Queensland.

This document constitutes the formal NSW State and National Recovery Plan for the Smooth Davidsonia. It identifies the actions to be taken to ensure the long-term viability of the Smooth Davidsonia in nature and the parties who will undertake these actions. The attainment of this Recovery Plan's objectives is subject to budgetary and other constraints affecting the parties involved.

This plan has been prepared by the Department of Environment and Conservation (NSW) (DEC) in consultation with the Gold Coast City Council (GCCC), the Queensland Environment Protection Agency/Queensland Parks and Wildlife Service (EPA/QPWS), and relevant local government authorities.

2 Legislative Context

2.1 Legal status

The conservation status of the Smooth Davidsonia throughout its range is summarised in Table 1. The taxon of the Smooth Davidsonia varies depending on the legislation under which it is listed. The Smooth Davidsonia was previously listed on Schedule 1 of the NSW *Threatened Species Conservation Act* 1995 (TSC Act) as *Davidsonia* sp. A Mullumbimby-Currimbin (sic), but has now been described and named as *D. johnsonii* (Harden & Williams 2000).

Table 1. Summary of conservation status of the Smooth Davidsonia

Legislation	Taxon	Status
NSW TSC Act	*D. johnsonii*	Endangered
Queensland *Nature Conservation (Wildlife) Regulation* 1994	*D. johnsonii*	Endangered
Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999	*D.* sp. Mullumbimby-Currumbin	Endangered

2.2 Legislative framework for threatened species, populations and communities in NSW

Responsibilities under the NSW *Threatened Species Conservation Act* 1995

Recovery plan preparation, exhibition and implementation

The TSC Act and the NSW *Threatened Species Conservation Amendment Act* 2002 (hereafter referred to jointly as the TSC Act) provide a legislative framework to protect and encourage the recovery of Endangered and Vulnerable Species, Endangered Populations and Endangered Ecological Communities in NSW. Under this legislation the Director-General of the Department of Environment and Conservation (NSW) (formerly National Parks and Wildlife Service) has a responsibility to prepare Recovery Plans for all species, populations and ecological communities listed as Endangered or Vulnerable on the TSC Act schedules. The TSC Act includes specific requirements for both the matters to be addressed by Recovery Plans and the process for preparing Recovery Plans. This Recovery Plan satisfies these provisions.

This Recovery Plan was placed on public exhibition from the 14 April 2004 – 20 May 2004.

The *Threatened Species Conservation Amendment Act* 2002 states that an approved Recovery Plan must include a summary of advice given by the NSW Scientific Committee with respect to the plan, details of any amendments made to the plan to take account of that advice and a statement of the reasons for any departure from that advice. This summary is provided in Appendix 5.

The TSC Act requires that a government agency must not undertake actions inconsistent with a Recovery Plan. The actions identified in this plan for the recovery of the Smooth Davidsonia are the responsibility of the DEC in NSW; in Queensland the GCCC and EPA/QPWS are potential contributors to the recovery process. Other public authorities may have statutory responsibilities relevant to the conservation and protection of the Smooth Davidsonia.

Consultation with indigenous people

Local Aboriginal Land Councils, Elders and other groups representing indigenous people in the areas where the Smooth Davidsonia occurs were identified, and provided with a copy of the Recovery Plan. Comments on the draft of this Recovery Plan were sought from these groups. It is the intention of the DEC to consider the role and interests of these

indigenous communities in the implementation of the actions identified in this plan.

Critical Habitat

The TSC Act makes provision for the identification and declaration of Critical Habitat for species, populations and ecological communities listed as Endangered. Once declared, it becomes an offence to damage Critical Habitat (unless the action is specifically exempted by the TSC Act or otherwise approved) and a Species Impact Statement (SIS) is mandatory for all developments and activities proposed within Critical Habitat.

Key Threatening Processes

As of November 2004 there are 24 Key Threatening Processes listed on the TSC Act. Of these 'clearing of native vegetation' (NSW Scientific Committee 2001) is relevant to the Smooth Davidsonia. In addition to this Key Threatening Process, a range of other processes are recognised as threatening the survival of the species in NSW.

Licensing

Any activity not requiring development consent under the NSW *Environmental Planning and Assessment Act* 1979 (EP&A Act) or the NSW *Native Vegetation Act* 2003 (NV Act), which is likely to pick the Smooth Davidsonia or damage its habitat, requires a licence from the DEC under the provisions of the TSC Act and *National Parks and Wildlife* Act 1974 (NPW Act) as a defence against prosecution. If the impact is likely to be significant, a SIS is required.

Other conservation measures

The TSC Act includes provision for other measures that may be taken to conserve the Smooth Davidsonia and its habitat, including the making of a Stop Work Order or Joint Management Agreement.

2.3 Relationship to other NSW legislation

Additional NSW legislation relevant to the conservation and recovery of the Smooth Davidsonia includes the following:

- *National Parks and Wildlife Act* 1974;
- *Environmental Planning and Assessment Act* 1979;
- *Local Government Act* 1993;
- *Forestry and National Park Estate Act* 1998;
- *Rural Fires Act* 1997;
- *Rural Fires and Environmental Assessment Legislation Amendment Act* 2002; and
- *Native Vegetation Act* 2003.

The interaction of the above legislation with the TSC Act with respect to the Smooth Davidsonia is varied.

2.4 Legislative framework for Endangered plants in Queensland

Queensland legislation relevant to the conservation and recovery of the Crystal Creek Walnut includes the following:

- *Nature Conservation Act* 1992;
- *Integrated Planning Act* 1997; and
- *Vegetation Management Act* 1999.

2.5 Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999

The Commonwealth EPBC Act provides a legislative framework for the protection of threatened species across Australia. An important role of the EPBC Act is to facilitate the preparation and implementation of Recovery Plans for species listed under the Act in co-operation with the States and Territories in which populations of listed species occur. The Act also seeks to impose the obligation (arising from the listing) for responsible agencies (particularly Commonwealth) to adopt protective measures. This Recovery Plan will be submitted to the Commonwealth for approval under the EPBC Act.

Under the EPBC Act, Critical Habitat may be registered for any Nationally listed threatened species or ecological community. When adopting a Recovery Plan, the Commonwealth Minister for the Environment and Heritage must consider whether to list habitat identified in the Recovery Plan as being critical to the survival of the species or ecological community. It is an offence under the EPBC Act for a person to knowingly take an action that will significantly damage Critical Habitat (unless the EPBC Act specifically exempts the action). This offence only applies to Commonwealth areas. However, an action which is likely to have a significant impact on a listed species is still subject to referral and approval under the EPBC Act.

As the Smooth Davidsonia is listed Nationally under the EPBC Act, any person proposing to undertake actions likely to have a significant impact on this species should refer the action to the Commonwealth Minister for the Environment and Heritage for consideration. The Minister will then decide whether the action requires EPBC Act approval. This is in addition to any State or Local Government approval required.

Administrative guidelines are available from the Commonwealth Department of Environment and Heritage to assist proponents in determining whether their action is likely to have a significant impact.

3 Species Information

3.1 Taxonomy

Taxonomic background

The genus *Davidsonia* is currently in the family Cunoniaceae (Harden & Williams 2000). Species in this genus have alternate leaves, and the wood anatomy and seed characteristics that distinguish them from other members of Cunoniaceae. These differences have, in the past, led to the placement of the genus in the mono-generic Family Davidsoniaceae (Bange 1952; Watson 1987).

The Smooth Davidsonia is one of three species in the genus *Davidsonia*, which is endemic to Australia (Queensland and NSW) (Harden 2000). The genus also includes the threatened *Davidsonia jerseyana* (Davidsons plum), which is restricted to north-eastern NSW and South-eastern Queensland. The Davidsons Plum is restricted to north-eastern NSW and co-occurs with the Smooth Davidsonia. The third species in the genus, *D. pruriens*, is found in north-eastern Queensland.

Taxonomic description

The Smooth Davidsonia is a bushy tree, mostly 5–12 m high, but specimens 18 m in height are known. The species habitually occurs in clumps and is often surrounded by numerous small root suckers. Some stands are extensive and almost monocultural.

Trees are well-branched with dense crowns. Young growth is covered with soft, non-irritant hairs, but mature leaves are almost hairless. The leaves are alternately placed along the stems, green and glossy on the upper surface and duller beneath. The leaves are usually 10–33 cm long, commonly with five to nine leaflets. The leaflets are 2–15 cm long, 1.5–6 cm wide, with evenly toothed margins. The leaf stalk is 3–7 cm long.

Small dark-pink flowers are arranged along a flower-bearing stem, borne amongst the leaves.

Fruit are a flattened-ball shape, 20–39 mm long, 25–60 mm wide and 28–53 mm deep, reddish-purple to purplish-black sprinkled with fine hairs, appearing smooth. The fruit has a reddish flesh, and usually two, sometimes three, seed cases. Seed cases are short and softly fibrous but rarely contain seeds (Harden & Williams 2000). Reproduction by individuals at known sites is vegetative, by way of root suckers.

A full taxonomic description of the species is included in Harden and Williams (2000) and Harden (2000).

3.2 Distribution and abundance

Limits of known distribution

The Smooth Davidsonia is distributed from the Tallebudgera and Numinbah Valleys in Queensland to Tintenbar, near Ballina in NSW (Figure 1). Most locations are close to the coast, but two isolated locations are 25–30 km inland at Nimbin and Terania Creek.

Known population size

In March 1999, the total known population of the Smooth Davidsonia was approximately 2000 stems.

The reproductive biology of the Smooth Davidsonia (ie. primarily vegetative) suggests that the number of genetically distinct individuals may be low. It is possible that each of the specimens recorded from known sites are clonal.

Spatial population distribution

Smooth Davidsonia sites are not evenly distributed over the species known range. Several of the western-most sites are spatially remote, whilst other sites are clustered in suitable habitat in valleys and scattered on the coastal plain and ranges.

Surveys of a number of sites were carried out during the preparation of this Recovery Plan, with all but three sites visited and assessed during collection of leaf samples for genetic analysis. Census information and other demographic details are reported in Stewart and McKinley (1999) and Stewart (2001).

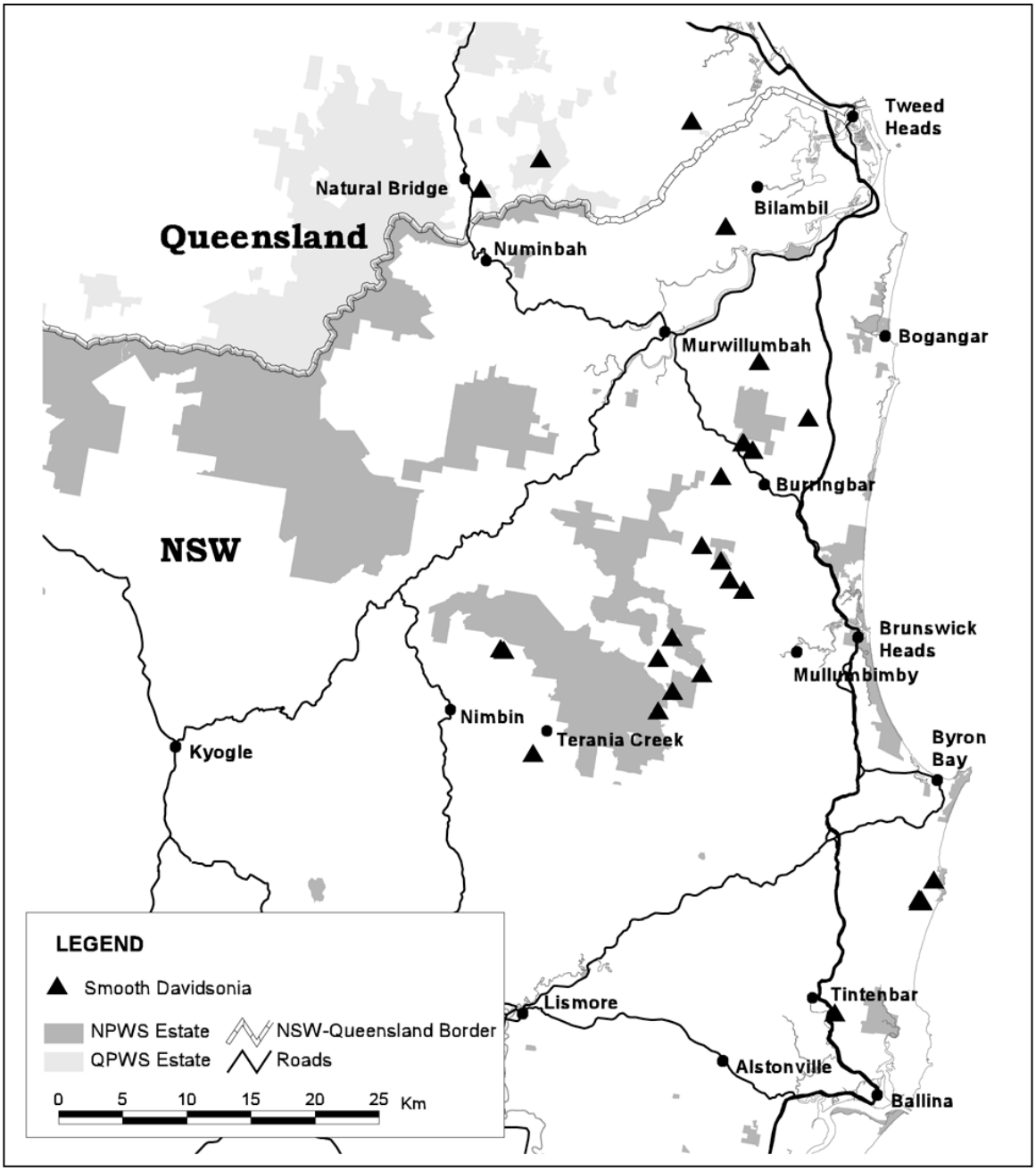

Figure 1. Known locations of the Smooth Davidsonia

Land tenure

All Queensland sites of the Smooth Davidsonia occur within freehold land, which is owned and managed by various private landholders.

NSW sites of the Smooth Davidsonia occur within the following land tenures:

- Snows Gully Nature Reserve, Hogans Scrub and Goonengerry Nature Reserve, which are managed by the DEC;
- Pocket Road Reserve, which is managed by Byron Shire Council (plants extend onto private property); and
- freehold land, owned and managed by various private landholders.

3.3 Land use zoning

Table 2 shows the land use zoning of sites where the Smooth Davidsonia occurs. Many sites occur on land that does not have zoning considered secure or consistent with nature conservation objectives.

Table 2. Zoning of land containing known Smooth Davidsonia sites

NSW sites		
Council Area	**Zoning**	**Description**
Tweed	7(l)	Environmental protection (habitat)
	1(a)	General rural
	Uncoloured land	Road reserve
Byron	1 (a)	General rural
	1 (b1)	Agricultural protection zone
	7 (c)	Environmental protection (water catchment zone)
	7 (j)	Scientific zone
	7 (k)	Environmental protection (habitat zone)
	8 (a)	National parks and nature reserve zone
	1 (a)	Road reserve
	7 (c)	Road reserve
Ballina	1 (d)	Rural - urban investigation
Lismore	1(a)	General rural
	1 (a)	Road reserve
	1 (a) 1 (r)	General rural–river lands
	1 (c)	Rural residential
Queensland sites		
Council Area	**Zoning**	**Description**
Gold Coast City	Rural	Rural (1:4 ha subdivision ratio)
	Rural	Rural (1:20 ha subdivision ratio)

3.4 Habitat

Vegetation

Current records suggest that the Smooth Davidsonia is found mainly in wet sclerophyll forests, with a smaller number of sites known from subtropical rainforest (complex notophyll vine forest) (McKinley & Stewart 1999). Records of individuals have also been made from land that has been cleared in the past. Plants still persist in these areas as isolated clumps in paddocks or in regrowth dominated by Lantana (*Lantana camara*) and other weed species.

Topography

Occurrences of the Smooth Davidsonia are known from an altitudinal range of 15–270 m (Watson 1987), with the highest locations being in NSW at Wilsons Creek (260 m) and Huonbrook (250 m).

The Smooth Davidsonia occurs on landforms that include moderate to gentle slopes, creek flats and gullies. Aspect is most commonly south-western to south-eastern, although at least one known site is in a north-facing location.

Geology and soil characteristics

The Smooth Davidsonia occurs on soil derived from a variety of parent materials. In the Tweed and Broken Head areas, the Smooth Davidsonia occurs on shallow, clay-loam podzol, with surface rocks, weathered from metasediments of the Neranleigh-Fernvale complex. Other sites are on soils derived from basalts and rhyolites of the Lamington volcanics. Occurrences at the boundaries of basalt and rhyolite are common.

Growth, development and longevity

Limited observation of *ex-situ* individuals suggests that the species is moderately slow growing and that first fruiting by individuals occurs approximately ten years after propagation, at a height of 2–3 m.

The age at which the production of root suckers can commence, and the extent to which soil disturbance and/or physical root damage is necessary, is unknown.

Population structure

Stewart and McKinley (1999) collected age and site structure information from five sites. This information indicated that root suckering was greatest at the more disturbed sites.

Ongoing details of size class structure at all sites are needed for informed management and should be collected as a part of a program of comprehensive census and measurement for each site (see Section 5).

Reproductive biology

Vegetative reproduction

The Smooth Davidsonia reproduces vegetatively by way of root suckers. Suckers are particularly prolific where soil has been disturbed or plants slashed. This mode of reproduction has enabled the species to survive even when surrounding vegetation has been completely cleared. Some sites appear to have regrown following the abandonment of pasture or banana plantations. No other forms of vegetative reproduction, such as layering, have been observed.

Flowering

Variation in flower structure has been observed between sites (Watson 1987). The sessile inflorescences are generally on terminal or sub-terminal axillary panicles, but occasionally occur on spikes. In some specimens, however, the female parts of the flowers are rudimentary, almost vestigial. At other sites, female parts are normally developed, comprising two fused carpels with four to five ovules (up to seven at one site) per carpel. Those sites with the best development of female parts in the flowers are also the heaviest fruit-bearing stands.

Considerable between-stand variation in flowering phenology has been observed (Watson 1987), however flowering times of trees within each site were identical. Flowering at some sites has been detected as early as September, whilst at other sites flowering did not commence until November.

Pollination

The method of pollination of Smooth Davidsonia flowers is not understood. The size and form of the flower suggest that the vectors are likely to be small insects. Bees (including native bees), beetles and ants have been observed visiting the flowers (F. Eliott pers. comm.).

Fruiting

Most fruiting occurs between December and March (Floyd 1989), but occasional fruit can occur as late as June (Stewart 2001).

Variation in fruit shape and production has been observed between sites (Watson 1987), with crops at two sites in particular being noted as heavy. Individuals at another population have fruit that are large and pear-shaped, which is in contrast to the typical apple-shape.

Further annual observation is required to investigate age to first fruit production, age at peak fruiting, and variation in flower/fruit production between sites and between years.

Seed production

There have only been two instances of seed being found within the fruit of this species (M. Rossetto pers. comm.).

Possible explanations for the low incidence of seed production by this species may include isolation from compatible plants, lack of production of pollen, no transfer of pollen from anther to stigma, non-viable pollen, self-incompatibility mechanisms, and early abortion of developing embryo. These possible explanations require further study.

Anecdotal accounts of occasional exceptionally large fruit containing seed have yet to be verified.

3.5 Ability of species to recover

There is currently insufficient information available to determine the ability of the species to recover. However the likelihood of the maintenance of existing individuals of the Smooth Davidsonia is considered high for the following reasons:

- two of the sites occur on land that is reserved for nature conservation, and some others have zoning that is consistent with nature conservation objectives;
- the species is clonal and in the absence of direct removal of sub-populations and unsuitable climate change the species is likely to persist in perpetuity;
- biological research proposed by the Recovery Plan will assist in determining the species' long term viability and guide future management; and
- contingency actions are recommended to safeguard the species against imminent extinction in the event of catastrophic disturbance.

3.6 Threats and reasons for decline

Habitat clearing, fragmentation and degradation are believed to be the primary threats to the Smooth Davidsonia (Quinn *et al.* 1995). Mechanical damage, grazing by domestic stock, collection of

propagation material for bush food and lack of genetic variation are additional threats.

A discussion of threatening processes is presented below.

Habitat clearing and fragmentation

Historical clearing of coastal rainforest habitat and conversion of land use to agriculture and development in NSW and south-eastern Queensland may have lead to the destruction of sub-populations of this species. The continuation of this trend poses a threat to remaining sub-populations.

Habitat fragmentation has isolated many Smooth Davidsonia sites that may formerly have been part of a system of continuous habitat. Isolation of individuals may be preventing the flow of genetic material.

Habitat degradation

Small areas of fragmented habitat are particularly prone to a range of habitat degradation processes. A discussion of the processes that may have lead to the degradation of the habitat of the Smooth Davidsonia is presented below. These processes are ongoing.

Exotic weed competition

Many records of the Smooth Davidsonia are from areas of regrowth vegetation, or on the edges of forests, situations in which it is particularly prone to exotic weed competition. At a number of locations on private land, lantana and/or native vines are overtopping the species, competing for light and resources and physically weighing down the plants. Smooth Davidsonia suckers do not appear to develop strongly in heavily shaded environments, although the extent to which shading and soil disturbance interact to control sucker initiation and development is not understood. Both sites recorded from conservation reserves occur on a forest edge and are threatened by exotic weed competition.

Weed control activities

The management of weeds in, and adjacent to, the habitat of the Smooth Davidsonia will require the combination of targeted bush regeneration efforts and broader regional solutions to reducing the sources of weed propagules in the surroundings.

The most common weed species in Smooth Davidsonia habitat are lantana and camphor laurel *(Cinnamomum camphora)*.

Clearing of lantana, an activity frequently carried out with crude mechanical methods (eg. brush hooks and tractors) may damage (though probably not destroy) plants of the Smooth Davidsonia concealed beneath. Careful scrutiny of lantana and regrowth is required before clearing.

Fire

As with most rainforest species, the Smooth Davidsonia is likely to be sensitive to fire. Fire is probably the biggest risk to those sites within a larger remnant community where the development of a significant fuel load is possible. A number of sites also occur in wet sclerophyll forest or in the ecotone between sclerophyll and rainforest communities. Others are in regrowth or lantana-dominated vegetation. Fire encroachment into these areas is possible in extreme conditions. It is likely that any damage will be irreversible if fires are of high intensity or frequency.

Lack of genetic variation

As the Smooth Davidsonia rarely sets seed, there is a low possibility of natural colonisation of new areas by this species. If all individual stems at each site are vegetatively connected it follows that there is very low genetic diversity present at each site.

The low population numbers, in conjunction with the inability of the Smooth Davidsonia to colonise new areas, may represent a reduced ability to respond to alterations in its environment, including climate change. The evolutionary potential of the species may, therefore, be limited.

An understanding of genetic variability in the Smooth Davidsonia is important for several reasons, including:

- an increased ability to accurately define the boundaries of sub-populations which will have practical consequences for habitat management and decision making;
- understanding the genetic significance of small sub-populations;
- ensuring that appropriate source material is used to adequately represent the genetic diversity of the species, should an *ex-situ* program be necessary; and
- understanding and managing the species' long term evolutionary potential.

There is currently very limited information on the genetic variation within and among Smooth Davidsonia sites. It is essential that all known occurrences of the Smooth Davidsonia are conserved as each is likely to represent distinct genetic material.

Road maintenance

In the Northern Rivers region, roadside vegetation forms a network across the landscape and, in some areas, represents the only original vegetation remaining. This network may contain threatened

species, uncommon vegetation communities and important genetic material.

Where the Smooth Davidsonia occurs on road reserves the trees are subject to root compaction and physical damage from roadways and road maintenance. Sites may also be impacted by roadside slashing, flail mowers or by herbicide application.

To date, there have been no comprehensive surveys of roadside vegetation within the known range of the Smooth Davidsonia. In the absence of such surveys, individuals of this species, and other threatened species, may be inadvertently damaged or cleared by roadside maintenance activities.

Collection for the bush food and nursery industry

Fruit from the Smooth Davidsonia is collected illegally from many sites for the bush food industry. If, as is currently believed, the fruit rarely contains seeds, collection poses little threat to the dispersal of the Smooth Davidsonia. However, if seed is produced on rare occasions, fruit collection may destroy a resource of particular conservation and scientific value. Trees may also be damaged during fruit collection, especially if they are climbed or ladders used to reach the fruit.

The collection of suckers for propagation material causes at least initial damage to the plant, with the potential for disease to enter the individual through the damaged area.

4 Previous Recovery Actions

4.1 Survey

Surveys of some habitat and potential habitat for the species were carried out prior to the preparation of this Recovery Plan (see Stewart & McKinley 1999). During these surveys, the numbers of individuals at each site were estimated, opportunistic observations of fruiting were recorded, and habitat and threats were recorded.

4.2 On-ground management

Two Smooth Davidsonia sites in NSW occur on land that is reserved and managed under the NPW Act.

In Queensland, a regional plan for vegetation management is currently being developed as part of the Gold Coast Regional Vegetation Management Plan, which was established under the VM Act. This regional plan will identify land and vegetation communities for specific protection.

The Byron Shire Tree Preservation Order protects Smooth Davidsonia habitat on private land in the Shire.

On-ground management has been limited to restoration works carried out by concerned private landholders. The DEC has yet to commence a remnant restoration program at Snows Gully Nature Reserve, although a management plan has been prepared.

Individuals of the Smooth Davidsonia found in Forest NSW estate or within 50 m outside the boundary of a forestry compartment are protected under the Threatened Species Licence of the IFOA for both the Upper and Lower North East Regions (1999). The following conditions apply:

a) An exclusion zone of at least 50 m radius must be implemented around all individuals.

b) An exclusion zone of at least 50 m wide must be implemented around all groups of individuals. A group is defined as more than one individual located less than 20 m apart.

4.3 Genetic research

Preliminary genetic research has been conducted to identify the most appropriate DNA extraction method for the species. A more detailed genetics study is currently being undertaken at Southern Cross University, Lismore, that aims to use molecular techniques to access the phylogenetic relationships within the *Davidsonia* genus and also to compare the genetic diversity within and between populations of *D. johnsonii* and *D. jerseyana*.

5 Proposed Recovery Objectives, Actions and Performance Criteria

The overall objective of this Recovery Plan is to prevent the decline of populations of the Smooth Davidsonia in the wild, to ensure ongoing viability of wild populations, and maintain the evolutionary potential of the species.

Specific objectives of the Recovery Plan for the species are listed below. For each of these objectives a number of recovery actions have been developed.

Objective 1: To co-ordinate the recovery of the Smooth Davidsonia population

Action 1.1:

The DEC will co-ordinate the implementation of the actions outlined in this Recovery Plan.

A co-ordinated approach is essential to oversee and assist in the implementation of the actions outlined

in this Recovery Plan in a timely, cost-effective and efficient manner.

Performance criterion: The DEC has co-ordinated the recovery actions included in this Recovery Plan for the life of the plan.

Action 1.2:

The DEC will co-ordinate the establishment of a Smooth Davidsonia working group.

Smooth Davidsonia sites are located across two States and a range of tenure, including freehold land. Effective implementation of the recovery actions for this plan will require the co-operation of all relevant stakeholders. A Smooth Davidsonia working group will enable all stakeholders to contribute to implementation of recovery actions.

The membership of this group will be dynamic, but will maintain a stable core of representatives from the community, the DEC, the GCCC and the EPA/QPWS

Performance criterion: A working group has been established and is operating within six months of the commencement of this Recovery Plan and continues to operate for the life of the plan.

Action 1.3:

The DEC will integrate the recovery program for this species with other relevant Recovery Plans, management plans and strategies developed and implemented by the DEC and other public authorities.

By integrating the recovery program for the Smooth Davidsonia Recovery Plan with actions included in other Recovery Plans, management plans and strategies limited resources can obtain a greater conservation benefit.

Performance criteria: Over the life of this Recovery Plan, the recovery program for the Smooth Davidsonia has been integrated with other Recovery Plans, management plans and strategies, where practicable.

Action 1.4:

The DEC will co-ordinate the development and implementation of a monitoring program to determine the effectiveness of management actions included in this Recovery Plan.

The development and implementation of a monitoring program will allow ongoing assessment and revision of the effectiveness of management actions included in this Recovery Plan.

Performance criterion: The monitoring program is developed within six months of the commencement of this Recovery Plan and implemented over the life of the plan.

Objective 2: To determine the size and extent of the Smooth Davidsonia population

Action 2.1:

The DEC will co-ordinate surveys to verify current records of the Smooth Davidsonia sites and complete an assessment of each site.

Record verification and site assessment has occurred for many of the known Smooth Davidsonia sites (see Stewart & McKinley 1999 and Stewart 2001). Further surveys are required to verify the location and condition of sites not yet assessed as this will provide guidance on the type of management required at each site. The 'Threatened Flora Site Assessment' form (Appendix 2) will be utilised during these site assessments.

Performance criterion: Location verification and site assessment have been initiated, where required, within six months of the commencement of this Recovery Plan.

Action 2.2:

The DEC will co-ordinate a systematic and comprehensive survey of all potential Smooth Davidsonia habitat. This Action can be undertaken in conjunction with Action 4.5.

The current known distribution of the Smooth Davidsonia is detailed in Section 3.2 of this Recovery Plan. Surveys for the species during the preparation of this Recovery Plan concentrated on confirming and investigating existing records in NSW and Queensland, with limited survey in identified potential habitat.

Systematic and comprehensive surveys of all areas of habitat where the Smooth Davidsonia may potentially occur are required to ensure that all extant individuals are identified and recorded. Site assessment utilising the 'Threatened Flora Site Assessment' form (Appendix 2) will occur for each new site recorded.

Performance criteria: Comprehensive and systematic surveys have been completed within one year of the commencement of this Recovery Plan. Site assessment has occurred for each new site recorded.

Objective 3: To gain a better understanding of the biology and genetics of the Smooth Davidsonia.

Action 3.1:

The DEC will develop and support biological and genetic research to investigate attributes relevant to the practical management of the Smooth Davidsonia and its habitat, and to increase understanding of the evolutionary potential of the species.

Key attributes of the biology and the genetics of the Smooth Davidsonia are currently unknown. A comprehensive program of biological and genetic research is required to systematically collect and analyse information concerning the Smooth Davidsonia and its habitat.

One of the aims of this research will be the investigation of the potential and extent of the processes of hybridisation between the Smooth Davidsonia and the other species within the genus.

In addition, research will include the identification of gene-flow within and between Smooth Davidsonia sites, with the long-term aim of guiding appropriate sub-population enhancement and population expansion.

Performance criteria: A program of research has been developed within one year of the commencement of this Recovery Plan. The research program is underway within two years of the commencement of this Recovery Plan.

Action 3.2:

The DEC will encourage the development and implementation of a program of in-situ *monitoring of key sites to detect changes in size, distribution and age structure.*

A low-impact *in-situ* monitoring program of key sites will be conducted annually to investigate flower and fruit production, rate of sucker production and growth, age to reproductive maturity and peak flowering/fruit production, impacts of disturbances, and results of management.

Performance criteria: A monitoring program has been developed within one year of the commencement of this Recovery Plan. The monitoring program is implemented over the life of the plan.

Objective 4: To manage and protect the Smooth Davidsonia population and associated habitat

Action 4.1:

The DEC will develop and maintain a record management system to facilitate co-ordination of the species' management. Public authorities and relevant community groups will be made aware of this information base and encouraged to contribute to and utilise this system to assist in effective management of the species and its habitat.

A site index, and all available census data, habitat description, threat assessments, recovery actions and opportunistic observations will be compiled and stored on this system.

Poor data management has numerous consequences for the management of natural resources. Consequences include duplicating existing work, undertaking unsuitable action choices, and overlooking threats that require action to be taken. Species record management increases the effectiveness and efficiency of recovery programs.

Performance criterion: A species record management system has been developed and record management is underway within one year of the commencement of this Recovery Plan.

Action 4.2:

The DEC will notify all relevant landholders/managers of the presence and location of the Smooth Davidsonia on their land.

Alerting landholders/managers to the presence of threatened species may prevent inadvertent damage to the species or its habitat, and may encourage involvement in the recovery program for the species. Landholders/ manager notification will occur for each new sub-population recorded for the life of the plan.

Performance criteria: All relevant landholders/ managers are provided with information on the locality of the Smooth Davidsonia within one year of the commencement of this Recovery Plan. Landholders/ manager notification will occur for each new sub-population recorded for the life of the plan.

Action 4.3:

The DEC will ensure that public authorities, relevant landholders or land managers are aware of the long-term protection measures and incentives programs to assist in the conservation of the Smooth Davidsonia.

Options available for facilitating long-term protection in NSW include:

- appropriate zoning under LEPs;
- the introduction and implementation of Tree Preservation Orders or equivalent;
- the development of VCAs under the NPW Act;
- Joint Management Agreements under the TSC Act; and
- acquisition of key sites.

Options available for facilitating long-term protection in Queensland include:

- appropriate designations under Local Government Planning Schemes;
- the development of Nature Refuges under the NC Act 1992; and
- the development of Local Government VCAs on private properties, including the designation of

habitat areas in Statutory Covenants under the *Land Act* 1993, development of property-based management plans, and associated financial incentives under these agreements.

All protective measures applied to sites will be developed in conjunction with, and require the consent of, appropriate landholders/managers.

Performance criterion: Where appropriate, consultation with landholders/managers with regard to conservation measures and incentives programs has commenced within the life of this Recovery Plan.

Action 4.4:

The DEC will prepare and implement site specific management plans for each site that occurs on DEC estate. The DEC will also encourage the development of site-specific management plans for Smooth Davidsonia sites that occur on lands held under other tenures. The DEC will provide assistance in the preparation and implementation of these plans where appropriate.

Site-specific management plans will ensure that on ground works are designed to address the specific threats to the Smooth Davidsonia at each location and that rehabilitation works are undertaken in a way which does not negatively impact on the species.

Strategies included in management plans for the species may consider habitat rehabilitation and expansion, fire management, erosion control, and protection from livestock. Management plans will also identify potential sources of funding to assist with the implementation of on-ground works.

Performance criteria: The DEC has prepared site-specific management plans for sites on which the species occur on the DEC estate within one year of the commencement of this Recovery Plan and implementation of these plans is ongoing. Where possible, site-specific management plans are prepared and being implemented for sites that occur on land held under other tenure types within the life of this Recovery Plan.

Action 4.5:

The DEC will liaise with all Councils within the range of the Smooth Davidsonia to assist in the identification and mapping of this species along roadsides. This Action can be undertaken in conjunction with Action 2.2.

Roadsides often contain remnant vegetation that has an important role in threatened species conservation, as well as providing more general land and water conservation benefits. In order for roadside vegetation to be managed appropriately, roadside managers must have adequate data on the species present.

Performance criteria: The DEC has initiated liaison concerning the identification and mapping of Smooth Davidsonia habitat on roadsides with all relevant Councils within six months of the commencement of this Recovery Plan. Identification and mapping is completed within two years of the commencement of this Recovery Plan.

Action 4.6

The DEC will liaise with relevant councils to ensure that roadsides are managed in a way that ensures that the both the Smooth Davidsonia and its habitat are not damaged or cleared during the development or widening of roads, or roadside maintenance activities.

Road development and widening activities and roadside maintenance in areas identified as having the Smooth Davidsonia present will be restricted to actions that avoid damage to the species or its habitat.

Performance criteria: The DEC has ongoing liaison with relevant councils to ensure that roadside sub-populations of the Smooth Davidsonia are appropriately managed.

Action 4.7:

The DEC will distribute survey and environmental assessment guidelines with a species profile package to relevant councils, public authorities, landholders/managers and consultant groups.

Presence of the Smooth Davidsonia and associated habitat requires the implementation of effective mitigation measures to reduce the impact of proposed developments or activities.

To ensure the Smooth Davidsonia is appropriately considered the survey and environmental assessment guidelines (see Appendix 2) and species profile package (Appendix 3) should be used by consultants, determining authorities, consent and concurrence authorities in their assessment of proposed developments or activity.

This package should also be used by land managers when preparing, implementing, and making decisions about strategic land-use planning documents such as Local Environment Plans, Development Control Plans, and Bush Fire Risk Management Plans.

Performance criterion: A package comprising survey and assessment guidelines and a species' profile has been distributed within three months of the commencement of this Recovery Plan.

Action 4.8:

The DEC will ensure that collection of fruit and propagation material from naturally occurring sites does

not occur in an unsustainable manner, or in a manner that inhibits the recovery of the Smooth Davidsonia.

The DEC will, in consultation with the bush-food and nursery industries, continue to implement the current licensing program for control of the collection of fruit and propagation material from naturally occurring Smooth Davidsonia sites (see Appendix 4).

The DEC will review the need for further collection from naturally occurring Smooth Davidsonia sites at the expiry of the licensing program in 2004/2005. Subsequent to this review process, appropriate planning and site management will be adopted to ensure that fruit and propagation material is not collected in an unsustainable manner, or a manner that inhibits the recovery of the species.

Performance criterion: The current licensing program has been implemented until 2004, then review to allow for appropriate protection mechanisms.

Action 4.9:

The DEC will develop and implement an education and awareness program.

This program will provide information on the species and its conservation, the processes threatening it, and the mechanisms and incentives available to ameliorate or eliminate these threats.

DEC will identify a variety of target groups and will style the education program to provide relevant information at a level appropriate for each group. This program will complement Actions 4.3, 4.5 and 4.6.

Target groups should include but not be restricted to: public authorities, local Councils, Bush Fire Management and Advisory Committees, local industry, Landcare groups and Catchment Management Authorities, funding bodies, local community groups, schools, and landholders/managers.

Performance criterion: An education and awareness program has been developed and implemented within two years of the commencement of this Recovery Plan.

Objective 5: To expand the population size of the Smooth Davidsonia.

Action 5.1:

The DEC will support research to determine the viability of enhancing existing sub-populations and establishing new sub-populations.

Given the low number and isolated nature of Smooth Davidsonia sites, the appropriateness of sub-population enhancement and population expansion as a means of species conservation will be investigated.

Performance criterion: Research to establish the viability of sub-population enhancement and/or expansion will be underway within three years of the commencement of this Recovery Plan.

Action 5.2:

Dependent on the results of Action 5.1, the DEC will identify suitable sub-populations for enhancement and/or sites to conduct population expansion. The DEC will liaise with relevant landholders/managers and, where possible, the DEC will undertake sub-population enhancement and expansion.

Sub-population enhancement and population expansion must be conducted utilising appropriate genetic principles, including the maintenance of diversity and managing inbreeding (see Action 3.1). The identification of the most suitable sub-populations for enhancement is critical to project success. Sites for population expansion must consist of appropriate habitat and be available for planting of individuals sourced from the most suitable parentage.

As the Smooth Davidsonia occurs on a variety of tenure types, it will be essential to conduct landholders/managers consultation as an integral part of site selection.

Performance criteria: The DEC has identified suitable sub-populations for enhancement and sites for population expansion within three years of the commencement of the plan. The DEC has conducted liaison with relevant landholders/managers within three years of the commencement of the plan. Where possible, sub-population enhancement and population expansion is underway within four years of the commencement of this recovery plan.

Objective 6: Gain an understanding of the cultural importance of the Smooth Davidsonia to Local Aboriginal Land Councils, Elders and other groups representing indigenous people.

Action 6.1

The DEC will support community consultation to identify the cultural importance of the Smooth Davidsonia to Local Aboriginal Land Councils, Elders and other groups representing indigenous people from the area within which the Smooth Davidsonia has been recorded. This knowledge will be incorporated into the management of the species subject to consultation with and approval by Aboriginal communities.

A number of Local Aboriginal Land Councils, Elders and other groups representing indigenous people

occur in the area from which the Smooth Davidsonia has been recorded. These groups will be offered the opportunity to undertake internal research regarding the views and interests of the Aboriginal people they represent in relation to the Smooth Davidsonia.

Performance criteria: Research programs to identify the cultural importance of the Smooth Davidsonia has been initiated within two years of the commencement of this Recovery Plan. The information gained through these programs is incorporated into the management of this species for the life of this Recovery Plan.

Objective 7: To develop and implement a contingency plan to assist the long-term survival of the Smooth Davidsonia.

Action 7.1:

The DEC *will be establish and maintain, within suitable institutions, ex-situ collections representing an adequate proportion of the genetic diversity found within this species.*

The establishment of *ex-situ* populations and the storage of genetic material will protect against the total extinction of each genetically distinct unit of the Smooth Davidsonia should catastrophic events occur. The establishment of *ex-situ* representatives from each genetically distinct unit will assist in preserving the complete genetic diversity currently present within the Smooth Davidsonia population.

Performance criterion: Genetic studies will determine suitable material for ex-situ collections and plant material to be held within appropriate institution/s within the life of the plan.

Action 7.2:

Where the threat of extinction of the Smooth Davidsonia from a site is high the DEC will investigate whether establishing a translocation program is necessary. Should translocation be deemed necessary, a translocation program will be developed and implemented.

Translocation is not considered a mitigating measure. Translocation as a means of population conservation should only be considered when all *in-situ* options have been exhausted. Any translocation program will conform with the "Guidelines for the Translocation of Threatened Plants in Australia" (Vallee *et al.* 2004) and will require endorsement by the DEC.

Performance criterion: The DEC will carry out a full assessment of any translocation proposals for the life of this plan.

6 Implementation

Table 3 outlines the implementation of recovery actions specified in this plan to relevant government agencies and/or parties for the period of five years from publication.

7 Social and Economic Consequences

Implementation of this Recovery Plan will have social benefits for local communities, by increasing general public awareness of natural heritage values in NSW. The implementation of this Recovery Plan supports the principle of intergenerational equity.

The Recovery Plan promotes the conservation of threatened species on both public and private lands. Some minor alteration to land management practices will be encouraged to be undertaken by landholders and managers, however any costs could be offset through the support associated with voluntary conservation mechanisms and the benefits of increased biodiversity values of their land.

8 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:

- provision and maintenance of a range of ecosystem services on living organisms depend;
- contributing to increased ecological knowledge of species, habitats and broader ecosystems;
- potential medical, economic, agricultural and industrial products; and
- cultural, aesthetic and spiritual biodiversity values.

The appropriate ecological management of Smooth Davidsonia habitat will contribute to the conservation of several other threatened species and Rare or Threatened Australian Plants (ROTAP) (Briggs and Leigh 1996) flora which have been recorded in, and adjacent to, known Smooth Davisdsonia sites, including: *Acronychia littoralis, Archidendron muellerianum, Cordyline congesta, Cupaniopsis newmannii, Elaeocarpus williamsianus, Endiandra globosa, Endiandra muelleri* subsp. *bracteata, Hicksbeachia pinnatifolia, Randia moorei, Ochrosia moorei* and *Syzygium moorei.*

In addition, the protection of habitat supporting the Smooth Davidsonia will assist in the conservation of Lowland Sub-tropical Rainforest on Floodplain.

9 Preparation Details

This Recovery Plan was prepared Pamela Gray. A preliminary draft of this Recovery Plan was prepared by Barbara Stewart and Annette McKinley, Landmark Ecological Services Pty Ltd.

10 Review Date

A major review of this Recovery Plan will occur within five years of the date of its publication.

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12 Acronyms Used in this Document

DEC	Department of Environment and Conservation (NSW)
DIPNR	Department of Infrastructure Planning and Natural Resources
EPA/QPWS	Environment Protection Agency/Queensland Parks and Wildlife Service
EP&A Act	NSW *Environmental Planning and Assessment Act* 1979
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999
GCCC	Gold Coast City Council
IFOA	Integrated Forestry Operations Approval
NPW Act	NSW *National Parks and Wildlife Act* 1974
NPWS	NSW National Parks and Wildlife Service
NSW	New South Wales
NV Act	NSW *Native Vegetation Act* 2003
ROTAP	Rare or threatened Australian plant
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
TSC Act	NSW *Threatened Species Conservation Act* 1995
VCA	Voluntary Conservation agreement

Table 3. Estimated costs of implementing the actions identified in the Smooth Davidsonia Recovery Plan

Action No:	Action Title	Priority	Estimated Cost/yr ($)					Total Cost ($)	Responsible Party/ Funding Source	In-Kind ($)	Cash ($)
			Year 1	Year 2	Year 3	Year 4	Year 5				
Action 1.1	Co-ordinate Recovery Plan	1	1 750	1 750	1 750	1 750	1 750	**8 750**	**DEC**	8 750	-
Action 1.2	Establish working group	1	1 750	1 750	1 750	1 750	1 750	**8 750**	**DEC**	8 750	-
Action 1.3	Integrate with strategies and management plans	2	700	700	700	700	700	**3 500**	**DEC**	3 500	-
Action 1.4	Develop recovery action monitoring program	1	1 750	700	700	700	700	**4 550**	**DEC**	4 550	-
Action 2.1	Surveys to verify existing records	1	5 000	-	-	-	-	**5 000**	**DEC**		5 000
Action 2.2	Survey for new records	1	30 000	-	-	-	-	**30 000**	**DEC**	-	30 000
Action 3.1	Research into biology, ecology and genetics	1	50 000	50 000	50 000	50 000	50 000	**250 000**	**DEC**	-	250 000
Action 3.2	Monitoring program for sites	1	20 000	10 000	10 000	10 000	10 000	**60 000**	**DEC**	-	60 000
Action 4.1	Record management system	1	5 000	1 050	1 050	1 050	1 050	**9 200**	**DEC**	4 200	5 000
Action 4.2	Landholders/manage r notification	1	1 750	350	350	350	350	**3 150**	**DEC**	3 150	-
Action 4.3	Awareness of the long-term protection measures	2	1 750	350	350	350	350	**3 150**	**DEC**	3 150	
Action 4.4	Site-specific management plans	1	7 000	7 000	7 000	7 000	7 000	**35 000**	**DEC**	17 500	17 500
Action 4.5	Roadside survey and mapping	1	10 000	10 000	10 000			**30 000**	**DEC**	5 000	25 000

Action 4.6	Liaison with councils concerning roadside management	1	3 500	3 500	3 500	3 500	3 500	**17 500**	**DEC**	17 500	
Action 4.7	Survey and environmental assessment guidelines	1	4 700	-	-	-	-	**4 700**	**DEC**	700	4 000
Action 4.8	Implement licensing program	1	350	350	350	350	350	**1 750**	**DEC**	1 750	
Action 4.9	Develop and implement an education and awareness strategy	1	5 000	5 000	5 000	5 000	5 000	**25 000**	**DEC**	10 000	15 000
Action 5.1	Research to determine the viability of sub-population enhancement	1	-	-	10 000	-		**10 000**	**DEC**	-	10 000
Action 5.2	Population enhancement and expansion	1	350	350	10 000	11 750	10 000	**32 450**	**DEC**	2 450	30 000
Action 6.1	Cultural importance of the species	1		9 000				9 000	DEC	-	9 000
Action 7.1	*Ex-situ* populations and storage of genetic material	1	20 000	5 000	5 000	5 000	5 000	**40 000**	**DEC**		40 000
Action 7.2	Translocation program ◊	2	-	-	-	-	-	-	**DEC**	-	-
Total			**170 350**	**106 850**	**117 500**	**99 250**	**97 500**	**591 450**		**90950**	**500500**

* Priority ratings are: 1 - action critical to meeting plan objectives; 2 - action contributing to meeting plan objectives; 3 - desirable but not essential action
# 'In-Kind' Funds represent salary component of permanent staff and current resources
^ 'Cash' Funds represent the salary component for temporary staff and other costs such as the purchasing of survey and laboratory equipment
◊ To be only implemented in exceptional circumstances. Funding to be determined as required

Appendix 1: Threatened Flora Site Assessment

To be utilised to record new sites and sites inadequately recorded previously.

SPECIES

Scientific Name .....

Common Name .....

Caps Code .....

DATE OF RECORDING .....

RECORDER/S

Name/s .....

Organisation .....

Address .....

Phone .....

LOCATION

Map Name .....

Map Number .....

Grid Reference (from map)

- Global Positioning System used? Y/N

– Easting (6 digits) ..... Northing (7 digits) .....

– Accuracy .....

Land Tenure local/state/federal government/freehold/National Park/Nature Reserve/Crown Land/Flora Reserve/State Forests/SEPP 14 wetland/SEPP 26 rainforest/reserve/environment zoning/conservation agreement/other ....

.....

Name and address of landowner, if known .....

Local Government Area .....

Precise Locality (description to be detailed to allow population to be located)

.....

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Location Sketch Map (detailed map to enable site to be relocated)

SITE DESCRIPTION

Topography crest/ridge/upper slope/mid slope/lower slope/gully/flat/ depression/watercourse/escarpment/other

.....

Habitat Condition

- Remnant Size ..... hectares ..... m long ..... m wide
- Large (> 40ha) area of contiguous native vegetation
- Corridor ..... m long ..... m wide
- Isolated Remnant – size of nearest remnant and distance to next native vegetation
- Isolated Specimen

Vegetation Condition

- Understorey suppressed/developed/overmature/senescing
- Evidence of Dieback
- intact largely indigenous/partially degraded/severely degraded

Current Land Use .....

Past Land Use .....

Time Since Last Fire/Fire History .....

Time Since Logging/Grazing .....

Evidence of other disturbance eg erosion, slashing

Disturbance History

- Time since disturbance
- Accuracy
- Observation Types
- Overall conditions

HABITAT CHARACTERISTICS

Aspect ..... **Slope** ..... **Altitude** .....

Geology granitic/basalt/conglomerate/sandstone/siltstone-mudstone/alluvium/ limestone/metamorphic/gravel/sand/unknown/other .....

Soil Landscape/Type .....

Soil Surface Texture sand/loam/clay/organic/gravel/skeletal/unknown/other

.....

Soil Drainage waterlogged - permanently inundated/annually/rarely/never

damp/well drained dry/well drained damp/other .....

Soil Depth skeletal/shallow/deep

Soil Disturbance intact/topsoil removed/landfill/other .....

Surface Stone/Rock ..... %

Vegetation Structural Formation (as per Wildlife Atlas)

Closed Forest/Open Forest/Woodland/Open Woodland/Grassland/Heathland/ Shrubland/Rainforest

Species Association (list full floristics within 10m of perimeter of population)

- Canopy – tallest and upper strata

.....

.....

.....

.....

- Understorey – mid-strata

.....

.....

.....

.....

- Groundcover – low strata (up to 1 m)

.....

.....

.....

- Vines/Climbers

.....

.....

.....

<>Mark weed species with *

<> Mark other threatened flora with #

<> Mark four most dominant species in each layer with (D)

POPULATION DETAILS

Growth form

Local Abundance frequent/occasional/rare

Area covered by sub-population ..... meters long meters wide

Spatial Distribution small scattered clumps/large continuous clump/isolated scattered individuals/ other ...

.....

Distance to nearest known sub-population

Breeding Status ..... buds ..... flowers ..... fruit .....

Plant Height (s) (cm) min. ..... max. ..... average ..... (ave.)

Estimated Age of Plants min. ..... max. ..... average .....

Vegetative Recruitment .....

Response after Disturbance .....

Is population natural (N) or planted (P)? .....

Population Structure

Life Stage	no. plants	min. no.	max. no.
Dead			
Senescent, dying			
Mature, non senescent			
Immature			
First year seedlings			

THREATENING PROCESSES

1) When is threat expected to operate? a) current b) < 1 year c) 1-5 years d) >5 years e) ongoing f) potential

2) How close is threat to population? a) on it b) 1-10m c) 10-100m d) >100m e) potential

3) Degree of Impact a) low b) medium c) high d) potential e) immediate f) long term

4) Discuss reason for assessment as threatening process.

Threats

- Vegetation clearance .....
- Earthworks Life Stage .....
- Mining/Quarrying .....
- Urban/Industrial Development/Expansion .....
- Utilities Construction/Maintenance .....
- Road/Track/Trail/Fence/Utilities construction/maintenance .....
- Isolation/Fragmentation .....
- Erosion/Sedimentation/Drainage/Irrigation/Pollution .....
- Inappropriate fire regimes/flooding regimes .....
- Rubbish dumping/Garden Refuse dumping .....

- Weed Invasion - specify species and % cover .....

.....

.....

- Trampling/Grazing stock/introduced herbivores/native herbivores .....

.....

- Plant Collection .....
- Recreational damage walkers/4WD/trailbikes/other .....
- Herbicide .....
- Disease/Pathogens .....
- Pests .....
- Timber Harvesting/Forestry Activities .....
- Agriculture .....
- Poor recruitment .....
- Small population size .....
- Hybridisation
- Loss of Pollination Vector
- Inbreeding
- Other .....

ASSESSMENT METHOD (Delete incorrect statements)

Population Assessment

- All plants in the population were individually counted; population data is very accurate
- Plants were individually counted in small plots, and the entire population is estimated from plot data
- Entire population was inspected and population size is estimated visually
- Small parts of the population were inspected and the entire population is estimated roughly
- Cursory inspection, estimate is a ball park guess or largely based on results from earlier assessments
- How much time was spent assessing the population? ..... hrs ..... mins

Threat Assessment

- All potential threats examined, assessed and recorded thoroughly and comprehensively
- All potential threats examined, assessed and recorded roughly
- Obvious threats examined and recorded thoroughly and comprehensively
- Obvious threats examined assessed and recorded roughly
- Other (provide details) .....
- How much time was spent assessing threatening processes? ..... hrs ..... mins
- Threats assessed on site only/part site/whole site
- Threats assessment off-site

HISTORIC MANAGEMENT ACTIVITIES (relevant to threatened species) (> 2 years old)

For example: fencing, signposting, fire management, grazing management, mowing/slashing, tree/shrub removal, visitor management, erosion control, weed control, pollination, seed collection, propagation, monitoring, research, translocation, liaison, reservation, enforcement, survey, other

Activity Type	Extended Notes	Date

RECENT MANAGEMENT ACTIVITIES (relevant to threatened species) (within last 2 years)

Activity Type	Extended Notes	Date

SUGGESTED MANAGEMENT ACTIVITIES (for future)

Activity Type	Extended Notes	Date

OTHER RECORDS

Collection Made Yes/No

Collection Type seed/cutting/plant/herbarium specimen/other .....

Purpose of Collection.....

Specimen lodged with National Herbarium/other.....

Photographs Taken Yes/No of what (plant, flowers, fruit, seed, roots, habitat, works)

Appendix 2: Environmental Impact Assessment Guidelines for *Davidsonia johnsonii* (Smooth Davidsonia)

The following information is provided to assist authors of Species Impact Statements, development and activity proponents, and determining and consent authorities, who are required to prepare or review assessments of likely impacts on threatened species pursuant to the provisions of the New South Wales (NSW) *Environmental Planning and Assessment Act* 1979. It is worth noting that these guidelines are directed towards New South Wales legislation, but can be adapted for Queensland.

Survey

Davidsonia johnsonii (Smooth Davidsonia) is a distinctive plant easily identifiable during both flowering and non-flowering periods of the species lifecycle. Therefore there are no seasonal survey constraints for this plant. Root suckers are distinctive even when very small.

Survey for the Smooth Davidsonia should not be limited to areas within the existing distributional limits, and should have two objectives:

1. to determine presence/absence; and, where the plant is present; and
2. to determine the abundance and size structure at sites.

Targeted survey for this species should be conducted by a small team of two to four people in suitable habitat.

Where the Smooth Davidsonia is present, threats, plant heights, diameter at breast height, and flowering and fruiting status should be recorded.

Limit of known distribution

The distribution of the Smooth Davidsonia is restricted. It is known from the Currumbin Valley in Queensland, close to the NSW border, and about 70 km south to Tintenbar near Ballina. Most locations are close to the coast, but two isolated sites are 25-30 km inland at Nimbin and Terania Creek.

The restricted distribution of the Smooth Davidsonia is likely to be the result of large-scale clearing of its lowland sub-tropical rainforest habitat, and its inability to colonise potential habitat. The remaining habitat is fragmented and degraded.

The loss of individuals from the limits of the plant's distribution may result in a range contraction, further isolation, and potentially the loss of genetic diversity.

Life cycle of the species

The biology of the Smooth Davidsonia is described in the Recovery Plan and summarised in the attached profile. The lifecycle of the Smooth Davidsonia is likely to be disrupted should any of the following occur:

- **Physical destruction of plants** removes at least the above ground portion of the plant. On current knowledge, the Smooth Davidsonia reproduces vegetatively only, by way of root suckers. Viable seeds are produced rarely. The plant's persistence is likely to depend on the appropriate management of habitat at known at known locations.

  Physical damage to plants may result from habitat clearing activities, repeated fires, trampling by humans or stock, or inadvertently during the removal of exotic weeds such as lantana from the habitat of the Smooth Davidsonia, the collection of suckers for propagation, and road slashing.

  The significance of a particular action which physically destroys individual plants will require (i) an examination of the number of plants to be destroyed in relation to the proportion of the relevant sub-unit/sub-population sizes[1]; and (ii) a discussion of the possibility of recovery from the disturbance. That is, whether the whole plant will be destroyed, or whether root systems will be left intact.

[1] A description of sub-populations, including estimates of numbers of individuals is provided in the Recovery Plan.

- **Fruit collection**

  Although seed production has rarely been recorded, seeds are produced by this species. Collection of fruit for bush food may occasionally result in the removal of seeds of particular ecological importance and scientific interest.

- **Habitat modification** affects the lifecycle of the Smooth Davidsonia by altering the ecological processes which underpin the fitness of suitable habitat. Habitat modification may include: fire, weed invasion, alteration to drainage, and soil compaction. Effects on other species which interact with *D. johnsonii* in processes such as herbivory will have indirect effects on the Smooth Davidsonia, though these are difficult to predict.

- **Threatening processes**

  As of November 2004 there are 23 key threatening processes listed on the TSC Act. Of these 'clearing of native vegetation' is relevant to the Smooth Davidsonia. In addition to this key threatening process, a range of other processes are recognised as threatening the survival of the species in NSW.

  The evolutionary potential of the Smooth Davidsonia may be threatened as a consequence of (i) reduced genetic variation due to low numbers of small sub-populations, each of which are possibly genetically uniform, and lack of genetic exchange with other sub-populations, and (ii) lack of seed production; however further research is required.

Viable local population

The minimum size of a viable local population of the Smooth Davidsonia is unknown. Any reduction in local population size should be avoided as a precautionary measure until a basis for the estimation of minimum viable population size is established.

Significant area of habitat

In assessing whether a significant area of habitat is to be modified or removed, the focus on assessment should be with reference to the areas of known habitat within the current distribution (ie. is the area of habitat significant in relation to the existing distribution). The following factors should be considered in relation to determining whether a significant area of the Smooth Davidsonia habitat exists:

- whether the Smooth Davidsonia habitat is present and the area of habitat present;
- whether the habitat in question is located within or outside of the current distributional limits;
- whether the habitat in question supports an apparent Smooth Davidsonia sub-population, and the number, density and age structure of the individuals occurring there[i]
- the proximity of the habitat in question to existing Smooth Davidsonia sub-populations;
- whether the habitat in question is continuous between existing Smooth Davidsonia individuals /sub-populations, and facilitates pollinator movement;
- whether the habitat in question is subject to threat and the likelihood of ameliorating any existing threatening processes; and
- whether the habitat in question will be permanently or temporarily modified/removed.

Isolation/fragmentation

Smooth Davidsonia sites are isolated from each other by an apparent inability to set seed, and by unsuitable habitat and land-clearing. The Smooth Davidsonia occurs in patches of varying sizes and densities.

Regional distribution of the habitat.

Smooth Davidsonia habitat occurs in lowland subtropical rainforest, wet sclerophyll forests, rainforest/sclerophyll ecotones, and regrowth. These vegetation communities are scarce within the range of the Smooth Davidsonia, having largely been cleared for agriculture and development. All lowland rainforest communities, wet sclerophyll forests and regrowth on land which formerly supported these communities, within and surrounding the range of the Smooth Davidsonia should be regarded as potential habitat.

Adequacy of representation in conservation reserves

The Smooth Davidsonia is reserved at Snows Gully Nature Reserve, Goonengerry Nature Reserve and in a private reserve at Hogans Scrub, however the species is regarded as inadequately reserved.

Critical Habitat

Critical habitat has not been declared for the Smooth Davidsonia in NSW.

For further information contact:

The *Davidsonia johnsonii* Species Co-ordinator, Threatened Species Unit (North East Branch), Department of Environment and Conservation (NSW), Locked Bag 914, Coffs Harbour NSW 2450

Appendix 3: Species Profile for *Davidsonia johnsonii* (Smooth Davidsonia)

Smooth Davidsonia *Davidsonia johnsonii*

SPECIES TYPE: Tree **FAMILY: Cunoniaceae**

- **Endemic to eastern Australia where it is known from Tintenbar, north-east New South Wales northwards to the Upper Tallebudgera Valley in south-east Queensland.**
- **Not recorded from any protected areas in Queensland, and from only two protected areas in New South Wales.**
- **Occurs in subtropical rainforest and in the transitional zone between subtropical rainforest and wet sclerophyll forest.**

Current threatening processes are destruction of habitat by clearing, and competition and modification of habitat by introduced plant species.

SPECIES PROFILE

G = see glossary

DESCRIPTION [2,3,4,5]

Davidsonia johnsonii is a tall shrub to a small bushy tree that is much branched from the rootstock. The bark is greyish-brown and smooth on young stems becoming somewhat corky on older stems. The young shoots have a covering of soft, non-irritant hairs. The stipules[G] are semi-circular in outline, measure 0.7 -1.5 cm in diameter and have a toothed margin. The leaves are usually 12-30 cm long and alternately arranged along the branchlets. Each leaf is subdivided into usually 5 to 9 leaflets, which are arranged in pairs along the main leaf stalk with a single leaflet at the tip. The leaflets are larger towards the tip of the leaf stalk. The leaflets are obovate[G] or ovate[G] in outline, measure 2 to 17 cm long by 1.5 - 7 cm wide, and are more or less hairless. The leaflet margins are coarsely toothed. The main leaf stalk is winged and irregularly toothed along its length. The small flowers are in loose pendulous clusters, which are borne near the end of the leafy shoots. The main flower stalk is up to 20 cm long and covered with soft hairs. Each flower has 8 to 19 stamens and 4 or 5 pink to red sepals that are approximately 3mm long. The edible reddish-purple to purplish-black fruits are apple-shaped, measure 2.5-6.0 cm in diameter and are covered with short brownish hairs.

BIOLOGY & ECOLOGY

Davidsonia johnsonii has been recorded flowering from September to November[3] and fruiting from January to June.[4,5,6] Although this species produces many fruit there only two records of viable seeds being produced.[2,3,5,6] The species suckers from the roots and is capable of regenerating vegetatively after clearing.[3,6] Its response to fire is not known.

HABITAT

Davidsonia johnsonii grows in well-drained loamy soils in disturbed subtropical rainforest and in the transitional zone between subtropical rainforest and wet sclerophyll forest.[2,3] Associated tree species in regenerating wet sclerophyll forests include Rose Gum (*Eucalyptus grandis*) and Brush Box (*Lophostemon confertus*).[3,4,5] Other common tree and shrub species present include Yellow Carabeen (*Sloanea woollsii*), Grey Possumwood (*Quintinia verdonii*), Soft Corkwood (*Caldcluvia paniculosa*), Murrogun (*Cryptocarya microneura*) and Guioa (*Guioa semiglauca*).[3,4]

CONSERVATION STATUS & DISTRIBUTION

Current Conservation Status

Queensland: Endangered[1]

New South Wales: Endangered[1]

Commonwealth: Endangered[1]

Distribution

Davidsonia johnsonii has a very scattered distribution in eastern Australia. It has been recorded from Tintenbar, north-east New South Wales northwards to the Upper Tallebudgera Valley in south-east Queensland.[2-5] It is not recorded from any protected areas[G] in Queensland and only two gazetted reserves in New South Wales, Snows Gully Nature Reserve and Goonengerry Nature Reserve.[5]

CURRENT THREATS TO THE SPECIES

1. Destruction of habitat by clearing on freehold land.[3]
2. Competition and modification of habitat by introduced plant species.[3]
3. Mechanical destruction through road maintenance works.
4. Lack of genetic variation.
5. Grazing by domestic stock

MANAGEMENT

Required management varies from site to site depending on the threats operating. Management actions will include control of exotic weeds using techniques that avoid damage to the Smooth Davidsonia. Roadside occurrences should be protected from slashing and other maintenance operations. The collection of fruit and propagation material for the bush food industry will be controlled by the Department of Environment and Conservation (NSW) through licensing provisions under the TSC Act.

A program of systematic measurement and recording will be implemented to detect changes in the Smooth Davidsonia sub-populations and further searches will be conducted to achieve a more accurate picture of the distribution and abundance of the Smooth Davidsonia. Contingency actions will be implemented where necessary.

A New South Wales and National Recovery Plan has been prepared for the Smooth Davidsonia. The Recovery Plan identifies the actions required to protect and maintain known and potential sub-populations and habitat of the Smooth Davidsonia and gives direction to research to assist future management.

GLOSSARY OF TERMS

Obovate: a 2-dimensional shape resembling a longitudinal section through a hen's egg, with the broader end at the tip.

Ovate: a 2-dimensional shape resembling a longitudinal section through a hen's egg, ie. the broader end at the base.

Stipules: an appendage arising on either side of the leaf stalk base.

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8. McIntyre, A. (2000) Pers. comm., New Wales Parks and Wildlife Service, Coffs Harbour.

AUTHOR AND DATE OF COMPILATION: D. Halford, June 2000. Amended for utilisation in NSW by the DEC (NSW), 2003.

FIRST REVIEW: W.J.F. McDonald, September 2000

Appendix 4: Guidelines for the Collection of Davidson's Plum Species (*Davidsonia johnsonii* and *Davidsonia jerseyana*) for Produce and Propagation Purposes

Introduction

The collection of plants from the wild can represent a potential threat to threatened species as well as local populations of more common plants.

In order to guide persons wanting to collect plants from the wild and to facilitate the processing of licence applications for the collection of threatened plants, the Department of Environment and Conservation (NSW) (DEC) has developed a set of guidelines governing the collection of *Davidsonia* species (*Davidsonia johnsonii, D. jerseyana*) for produce and propagation purposes only.

Legislative requirements

Section 91 Licence

Under the New South Wales *Threatened Species Conservation Act* 1995 (TSC Act), a licence is required for activities which may result in any of the following actions involving threatened plants:

- picking a threatened species, population or ecological community;
- damaging critical habitat; and
- damaging the habitat of a threatened species, population or ecological community.

The Director-General cannot compel a person to apply for a section 91 licence. This is the choice of any potential applicants who must weigh up the risks of not being protected by a licence for actions which may result in the harming or picking a threatened species, population or ecological community, and/or the damaging of habitat (including critical habitat) of a threatened species, population or ecological community.

c.) *Pick a native plant (including a threatened species, population or ecological community) means gather, pluck, cut, pull up, destroy, poison, take, dig up, remove or injure the plant or any part of the plant.*

Section 95 certificates

Despite section 91 of the TSC Act, section 95 states that:

if the Director-General determines that an action proposed is not likely to significantly affect threatened species, populations or ecological communities, or their habitats, a licence under this Act is not required and the Director-General must, as soon as practicable after making the determination, issue to the applicant a certificate to that effect.[2]

When does the Director-General need to make a determination as to significant effect?

Section 94(1) of the TSC Act requires that where a proposed action is not on land that is Critical Habitat and the application is not accompanied by a Species Impact Statement, the Director-General must determine whether the action proposed is likely to significantly affect threatened species, populations or ecological communities, or their habitats.

The factors to be considered when making this determination are contained in section 94(2) of the TSC Act.

Where the Director-General determines that the action proposed is likely to have a significant effect, the applicant must be notified that a Species Impact Statement (SIS) is required.

Recommended procedures

The following guidelines have been prepared by the DEC to ensure that collection of material of threatened *Davidsonia* species for produce and propagation purposes will not further threaten the survival of these species or a population of these species.

[2] The functions of the Director-General have been delegated to the TSU Manager and Manager BMU.

Adherence to these guidelines means that the activity is unlikely to have a significant effect on the threatened flora or their habitats. This will simplify the assessment process and should enable a Section 95(2) certificate to be issued.

If work additional to that prescribed in these guidelines is proposed, the DEC must further consider the likely significance of impact of the proposal, and may require preparation of an SIS.

The application process

For activities that require a section 91 licence, a signed application form is to be submitted. Attachment A contains a copy of the licence application form.

The application form specifies the information that must be provided in order for the DEC to determine the application.

Regardless of the type of action proposed, an applicant must address items 12 to 17. This is a statutory requirement pursuant to section 92(3) of the TSC Act where the action proposed is not on land that is Critical Habitat or where the application is not accompanied by a SIS.

Items 18 to 25 have been included in the application form to assist DEC officers make an assessment as to the significance of the potential impact of the proposed action. For activities involving the picking of threatened *Davidsonia* species for produce and propagation purposes, many of the items will not be relevant but can be addressed by reference to the guidelines.

Application fee

An application fee of $30.00 has been set by the DEC for section 91 licence applications. This fee must accompany the application form.

Incorporation of guidelines into application

The DEC encourages applicants to incorporate the following guidelines into all aspects of the application as measures to avoid or ameliorate the effect of the action.

The guidelines should be attached to the completed application form to the DEC for processing.

The applicant should clearly articulate on the Section 91 licence application that he/she will comply with attached guidelines and that they form part of the application. This should be done in writing.

Where the guidelines are not attached to the section 91 licence application, the DEC is likely to require additional information and processing of the application is likely to be delayed.

Processing the licence application

Statutory consideration

As discussed previously, the TSC Act provides that the Director-General, when considering a section 91 licence application which is not accompanied by a SIS, must determine whether the action proposed is likely to significantly affect threatened species, populations or ecological communities, or their habitats.[3]

In making this determination, the Director-General must take into account the factors provided in section 94(2) of the TSC Act.

These factors are outlined below:

a.) in the case of a threatened species, whether the lifecycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction,

b.) in the case of an endangered population, whether the lifecycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised,

[3] Section 94(1) TSC Act.

c.) in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed,

a. ***whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community,***

b. ***whether critical habitat will be affected,***

c. ***whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region,***

d.) whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process,

d. ***whether any threatened species, population or ecological community is at the limit of its known distribution.***

How do the guidelines apply?

The DEC has considered the following issues in developing the attached guidelines:

- the assumption that rats and birds take all the fruit that is not collected. It may be that this is natural dispersal and of benefit to the species;
- any fruit that falls to the ground and germinates is generally not suitable for produce but may be for propagation;
- the people wild-picking the species can collect and already have invaluable information about the species; and
- the long-term conservation outcomes from the implementation of the conditions of the guidelines.

Therefore, the DEC considers adherence, by applicants, to the guidelines is unlikely to have a significant effect on the threatened *Davidsonia* species in the long term.

Therefore, a Section 91 licence is unlikely to be required and a Section 95(2) certificate is likely to be issued.

Duration of certificates

Generally, certificates will only be issued for a maximum of 12 months. Consideration will be given to applicants beyond 12 months when requested in an application.

Any certificate issued may be revoked should the certificate holder fail to abide by the conditions the certificate was issued under or information becomes available that implies the activity is having a significant impact on the threatened *Davidsonia* species.

Guidelines for the Collection of Material from Threatened *Davidsonia* species for Produce and Propagation Purposes

Basic guidelines

1. Know the threatened species, populations and ecological communities likely to be in the area. Avoid any impacts to these species etc.
2. No collections of material are to be made from lands controlled by the DEC (this includes National Parks, Nature Reserves and some State Recreation Areas).
3. Prior to commencing any collecting of material of the threatened plants on lands other than those controlled by DEC, permission should be obtained from the relevant landowner or land manager.
4. Avoid unnecessary damage to sites or plants. Beyond any existing formed roads, access to sites must be by foot. No more than 6 visits to a site in one season. Unlimited visits may be made to isolated paddock trees.

Collecting material for Produce Purposes

1. No collections will be made from plants with less than 20 fruit.
2. No more than 90% of fruit will be taken from any one plant in a season. A minimum of 20 fruit will be left on individual plants.
3. If a seed from the Smooth Davidsonia is detected, the DEC must be notified and the seed propagated by the collector. Either the plant or material from the plant will be available for conservation projects.
4. Be alert to the presence of seedlings of threatened species, including *Davidsonia* species and avoid trampling them. Any seedlings observed will be reported to the DEC. No seedlings will be removed.
5. Avoid damage to the tree during harvesting. No native plants are to be damaged.
6. If using pruning poles, ensure collection is undertaken using clean secateurs.
7. Information on the sites that were harvested, the amount of fruit collected and left on tree is to be provided to the DEC after the harvesting season and before 30 June each year. The certificate will be revoked if this reporting is not provided by this date.

Collecting material for propagation purposes

- Cuttings

1. The following data are to be provided to the DEC by 30 June each year:

– location of source material;

– holding location of propagated plants;

– propagation techniques; and

– success.

2. Cuttings for propagation are only to be taken from healthy individuals.
3. A maximum of 10% of material may be taken from each plant for the purpose of taking cuttings for propagation.
4. No more than two (2) suckers of Davidson's Plum are to be taken from a site where greater than 20 suckering stems are present. No suckers may be taken from sites with less than 20 stems.

- Seed

1. Seed will be provided for propagation from wild collections for produce. Data to be provided to the DEC by 30 June each year includes: location of source material; distribution of seed; holding location of propagated plants; propagation techniques and success.
2. Material in plantations that originated from wild-picked seed or cuttings will be available to the DEC if requested. This material would be used for implementation of programs in the Recovery Plans for the species.
3. A maximum of 10% of fruit on the ground may be collected for propagation purposes.
4. No more than two visits to each site may be made for either seed or cutting collection for propagation purposes. If attempts at propagation are unsuccessful the DEC should be advised and written permission obtained for further visits.

Collecting samples for voucher herbarium specimens

1. For all sites visited where no herbarium specimens exist, collections are to be made of the *Davidsonia* species. A specimen is to be lodged with the National Herbarium at the Royal Botanic Gardens Sydney.
2. Specimens are to be removed using clean, sterile secateurs to ensure a clean and neat cut scar is left on sampled plants and that the possibility of transferring plant diseases is reduced.
3. When collecting a cutting for a specimen, take one sample large enough to identify the species and to make a standard size herbarium specimen.

4. A site assessment form must be completed at each site and provided both to the DEC the National Herbarium (with the specimen for lodging). An example is attached.
5. A Wildlife Atlas card will be completed for other threatened species detected.

Data Records

1. Once identification has been confirmed, any records of threatened species will be provided to the DEC in a format appropriate for entry into the Atlas of NSW Wildlife within three months of collection.
2. Any person who becomes aware of new plant species records for NSW or populations considered likely to extend the known range of any species is to provide such information to the DEC and Royal Botanical Gardens within three (3) months of becoming aware of the new information.

Additional Site Works

1. Site improvement such as weed removal around plants will be undertaken.
2. *Davidsonia* plants will not be planted at wild populations unless in accordance with a translocation program approved by the DEC.

Notes

The DEC may prohibit, condition, or limit collecting for some species at some sites if the collecting would affect research plots. Other conditions or prohibitions may apply after consideration of population estimates, age structure, viability and health of the population or individuals.

Where any doubt exists as to the advisability of permitting the collection or the level of collection to be permitted, a precautionary approach shall be enforced.

Should you require any further information please contact the DEC Threatened Species Unit (North East Branch), on (02) 66515946.

Appendix 5: Summary of Advice from the NSW Scientific Committee

Under Section 66A of the TSC Act, Recovery Plans must include a summary of any advice given by the NSW Scientific Committee, details of any amendments made to the plan to take account of that advice and a statement of reasons for any departure from that advice. The Scientific Committee's comments on the draft *Davidsonia johnsonii* Recovery Plan and details of amendments made are tabled below.

Section	Advice	Response
	A number of species also occur in Queensland, and the idea is that the plan becomes the national plan. However, all identified expenditure is from DEC – no contribution from Queensland is indicated (ie yet research in particular would benefit both states).	Noted. No amendment to text required. There has been no formal commitment from Queensland agencies to implement actions included in this Recovery Plan.
	The Scientific Committee is not able to comment on issues in Queensland.	Noted. No amendment to text required.
	The plan involves considerable expenditure (even though in the case of some of the research actions the suggested amounts seem unrealistically low). What is the likely-hood of DEC being able to support this level of expenditure?	Noted. Costings table amended as recommended.
	An issue for these, and other rainforest species, is that they are in cultivation. This raises issues of continuing collection, genetic "pollution" and well meaning 'do it yourself' 'recovery' actions.	Noted. No amendment to text required.
	There may be merit in DEC preparing a more generic position paper about issues raised by horticultural use of threatened species.	Noted. No amendment to text required.
p.3	*Native Vegetation Conservation Act* now *Native Vegetation Act*.	Noted. Text amended as suggested.
Appendix 2	Change Catchment Management Board to Catchment Management Authority.	Noted. Text amended as suggested.
P. 7, sect. 3.2	What is the basis for asserting that *Davidsonia johnsonii* would have been more widely distributed (as distinct from abundant)?	Noted. Text amended as suggested.

Department of
Environment and
Conservation (NSW)