



## 3.2 Status and management of key threats to park ecosystems

### Indicators

- Status and trend of key threats in parks
- Management response to key threats in parks
- Extent management objectives met for key threats in parks

### Context

In conserving park ecosystems park managers seek to direct most of their effort to minimise threatening processes that are having the greatest impact on the most significant conservation values. Some threats to natural assets are direct (e.g. weeds, predation, overgrazing), while others may be indirect or externally driven (e.g. climate change, lack of connectivity). With finite resources a planned and evidence-based approach is required to maximise the effectiveness of management interventions.

Management objectives for key threats included prevention wherever possible, eradication of new and emerging populations, containment or control of established threats to protect priority conservation assets and working with other land managers to control threats to economic values on adjacent land.

### Status of key threats in parks

Based on systematic assessments by park managers across 298 assessed parks, the most widespread reported threats to the natural assets of parks were from invasive species, notably weeds (87% of parks) and pest animals (86% of parks), non-compliance from illegal activities (72% of parks), inappropriate fire frequency and intensity (69% of parks) and visitor impacts (67% of parks). Other key threats such as overabundant native fauna (more than 11% of parks) and dieback agents such as Phytophthora (11% of parks) were reported.

While these results highlight the occurrence of key threats, park managers reported that the impact and trend of these threats varied depending on the type of threat. More parks reported increasing impacts from most key threats than declining impacts since 2010, indicating an overall increasing level of threat to nature conservation values.

A summary of the status and trend of key threats to natural assets for individual parks is located in Appendix 3.11 (summary table) and Appendix 3.12 (aggregated threat index map). The aggregated threat index is based on the impact and impact trend for multiple threats in each park.

### Distribution and impact of weeds

Weeds compete with indigenous vegetation for resources which often leads to the loss of native plant species. Native fauna may also be displaced through loss of habitat. Weeds can also have an impact of the aesthetic enjoyment of parks by visitors and agricultural productivity. The impact of weeds on parks' ecosystem health is dependent on a number of factors including weed biology and both past and current use. Weeds can include both introduced species as well as native species that are out of their normal range. While there are over 1000 introduced flora species in Victoria many of these are not invasive and do not pose a threat to the integrity to ecosystems. The highest priority for management of weeds include Weeds of National Significance (WONS), new and emerging weeds, state prohibited weeds (CaLP) and National Environmental Alert weeds (NEAL). A map of the weed species in Parks Victoria Estate is located in Appendix 3.13.

The total number of weeds is often a reflection of park size, rather than the condition of the park and the proportion of weeds to total flora species within each park more accurately reflects the weediness of a park. Parks that have a lower ratio of weeds to native species include Big Desert and Avon Wilderness parks while parks that have a higher ratio of weeds to native species include many of the urban and urban fringe parks (e.g. Dandenong Ranges and Point Nepean national parks) as well as parks with a legacy of land use disturbance such as Barmah and Terrick Terrick national parks.) A map of the proportion of weeds to total flora species in Parks Victoria Estate can be found in Appendix 3.14.

**Figure 3.2.1 Parks (National Parks Act) with the lowest ratio of weeds to native flora**

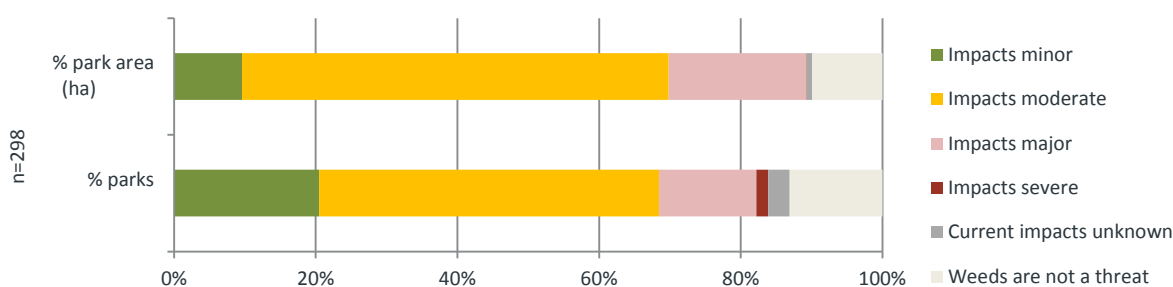
Park	Number of weed species recorded	Number of native flora species recorded	Ratio of weeds to native flora
Big Desert Wilderness Park	11	227	5%
Avon Wilderness Park	44	560	7%
Tara Range Park	26	312	8%
Errinundra National Park	74	776	9%
Alfred National Park	25	226	10%
Black Range State Park	64	554	10%
Coopracambra National Park	108	902	11%
Langi Ghiran State Park	66	459	13%
Cape Conran Coastal Park	92	551	14%
Mount Samaria State Park	70	414	14%
Deep Lead Nature Conservation Reserve (No. 1)	61	360	14%
Grampians National Park	260	1526	15%
Croajingolong National Park	197	1155	15%
Baw Baw National Park	87	510	15%
Tyers Park	50	283	15%
Wabba Wilderness Park	27	152	15%
Snowy River National Park	216	1211	15%
Bunyip State Park	114	631	15%
Cobboboonee National Park	89	490	15%

**Figure 3.2.2 Parks (National Parks Act) with the highest number of weeds to native flora**

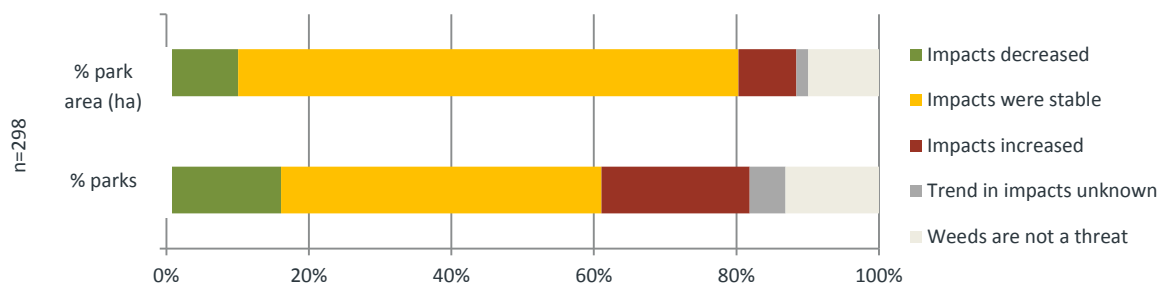
Park Name	Number of weed species recorded	Number of native flora species recorded	Ratio of weeds to native flora
Mount Worth State Park	35	78	31%
Churchill National Park	117	273	30%
Bay of Islands Coastal Park	90	205	31%
Warrandyte State Park	253	553	31%
Lysterfield Park	195	417	32%
Leaghur State Park	85	174	33%
Werribee Gorge State Park	168	342	33%
Dandenong Ranges National Park	247	498	33%
Terrick Terrick National Park	174	328	35%
Lake Albacutya Park	83	154	35%
Lower Goulburn National Park	124	219	36%
Gunbower National Park	117	202	37%
Mount Napier State Park	122	208	37%
Barmah National Park	266	423	39%
Woodlands Historic Park	141	208	40%
Organ Pipes National Park	212	297	42%
Nyah-Vinifera Park	58	74	44%
Point Nepean National Park	149	169	47%

Of the 298 parks assessed, 86% reported that weeds were an issue in the park. The impact of weeds was reported as moderate in the majority of parks, but 16% of parks (19% by area of the parks network area) reported that the impact from weeds was major or severe. Forty-five percent of assessed parks (70% of the area of the parks network) reported that weed impact was stable.

**Figure 3.2.3 Impact of weeds**



**Figure 3.2.4 Trend in impact of weeds**



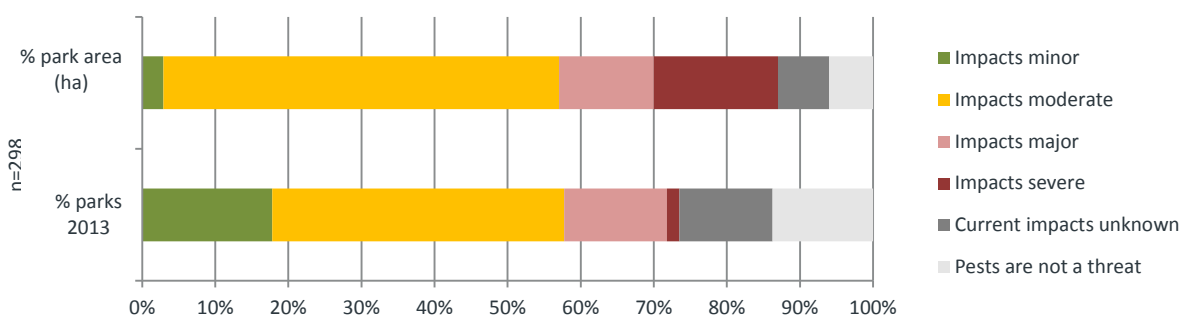
**Distribution and impact of pest animals**

A wide range of fauna that includes mammal, bird, fish and invertebrate species has been introduced into Victoria. Some species, like the European Rabbit and the Red Fox, are widespread, occurring in most areas across the state, while others like Horses occur in only a few parks.

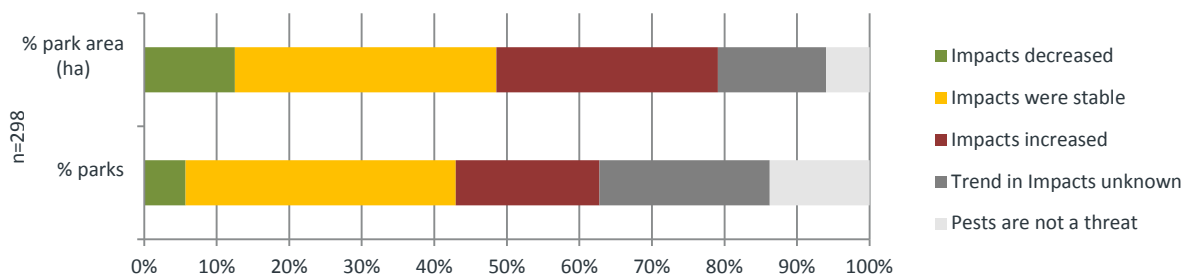
Many introduced fauna species pose a significant threat to the biodiversity of Victorian parks. Introduced predators like cats and foxes threaten the survival of a wide range of native fauna, many of which are threatened. Herbivorous introduced species including rabbits, feral goats, feral pigs and horses can have a significant impact on native vegetation, preventing regeneration, spreading weeds, and causing soil damage and erosion. They can also degrade habitat and also compete with native fauna for resources like food or shelter.

Of the 298 assessed parks, pest animals were an issue in 87% of parks. Forty per cent of parks (54% of the area of the parks network) reported that the impact of pest animals was moderate, with 16% of parks (30% of the parks network area) reporting that the impact from pest animals was major or severe. Significantly more parks reported that the impact of pest animals had increase than decreased since 2010.

**Figure 3.2.5 Impact of pest animals**



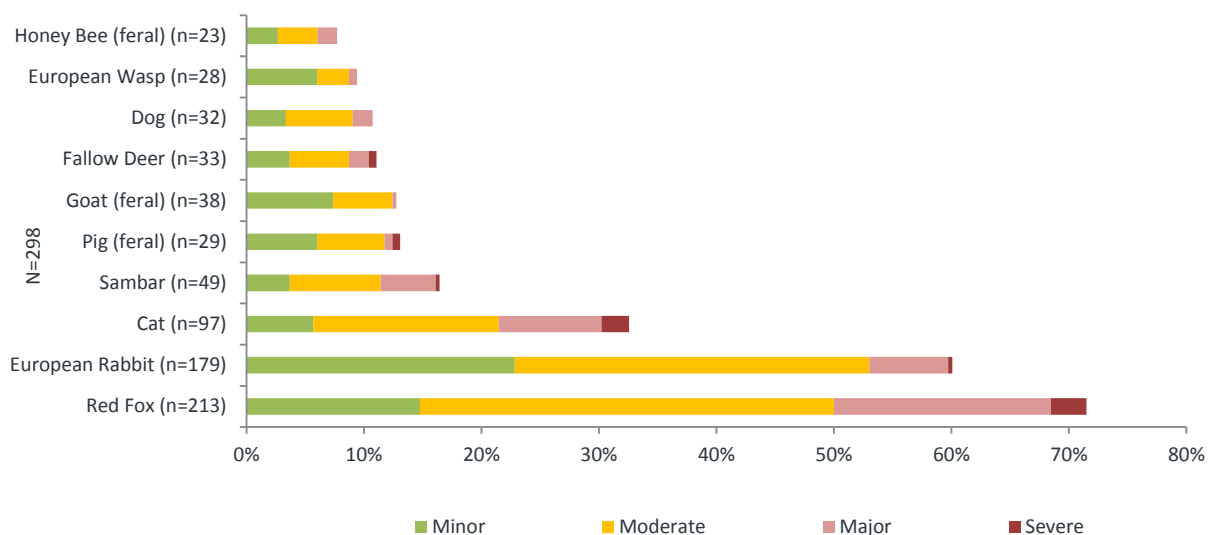
**Figure 3.2.6 Trend in impact of pest animals**



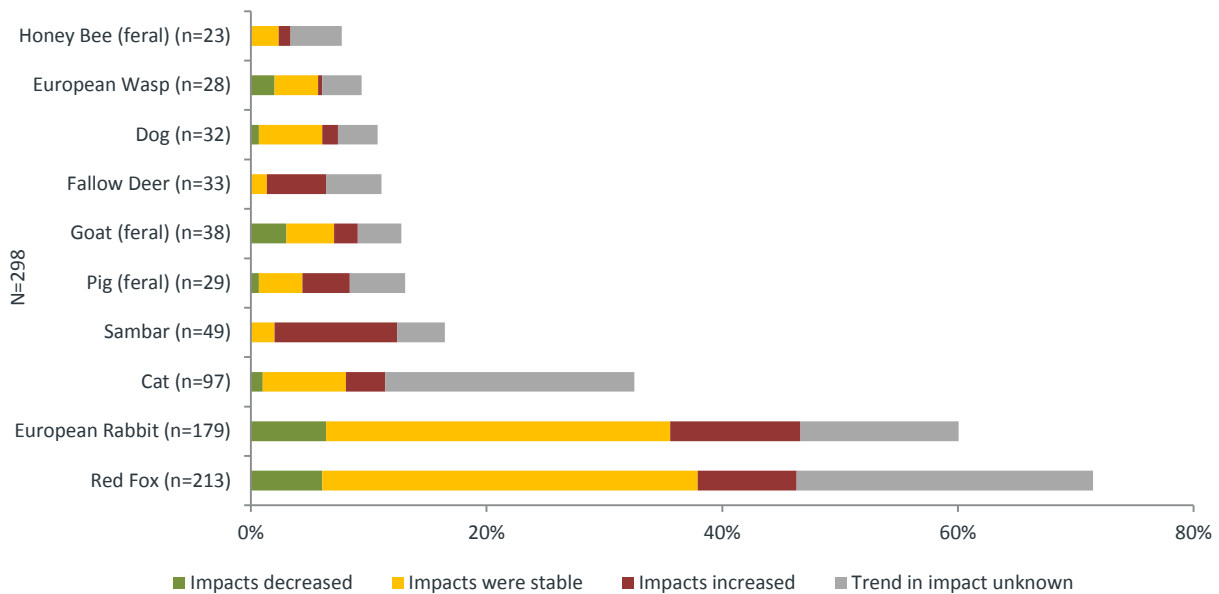
For specific pest animal species, the Red Fox and European Rabbit were the most widespread pest animals, reported as a threat to nature conservation values in 71% and 60% of parks respectively. The impact of Red Fox was reported as major or severe in 21% of assessed parks. Sambar Deer (16%), Pig (13%), Goat (13%), Fallow deer (11%), and Dog (11%) were other commonly reported species reported as threat to nature conservation values. Horses were reported as a priority threat in two parks. Other introduced animals reported as an issue included Common Starling, Black Rat, Rainbow and Brown Trout, Hog and Red Deer, Hare, and European Carp.

The trend in impact of different pest species was variable with more parks reporting increasing impact than decreasing impact for most pest animals. More parks reported that Red Fox and European Rabbit impacts were increasing than decreasing. Of the 49 parks where Sambar Deer was reported as an issue, nearly two thirds reported that the impact was increasing. The trend in the impact of the feral cat was unknown in the majority of parks where it was an issue highlighting the need for more research.

**Figure 3.2.7 Impact of most commonly reported pest animals**



**Figure 3.2.8 Trend in impact of most commonly reported pest animals**



### Distribution and impact of overabundant native species

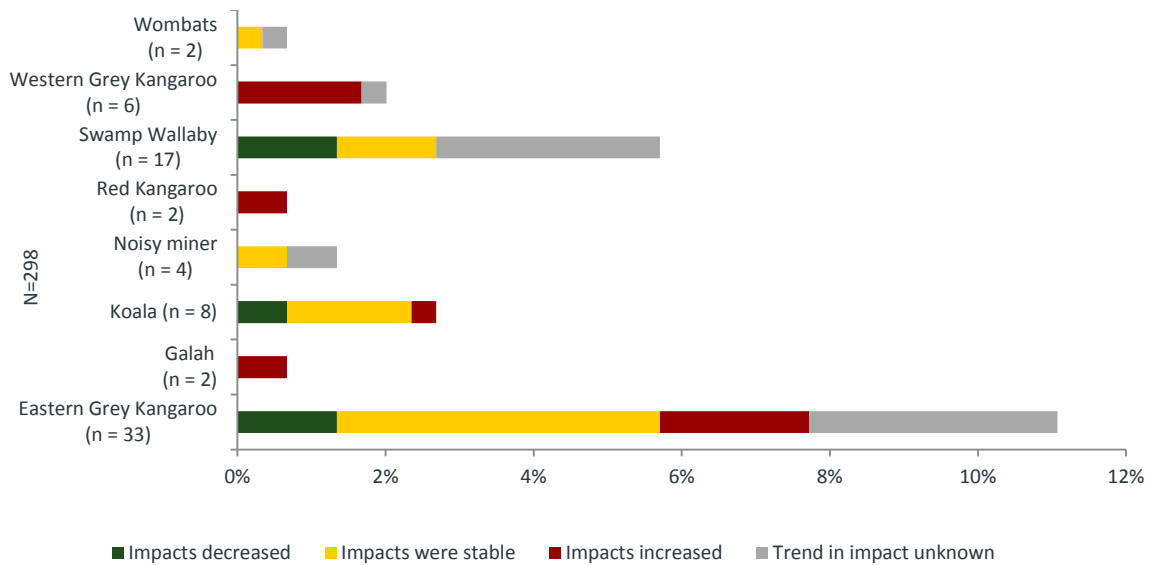
Native wildlife populations may become overabundant due to environmental factors, changes to food and water access, modification of land use and changes to predation (such as loss of apex predators from the ecosystem). This may result in the degradation of habitats through overgrazing and trampling, animal welfare concerns and impacts on economic and community assets.

The extent of impacts by overabundant native species was variable with 33 parks (11% of assessed parks) reporting impacts from Eastern Grey Kangaroos, six (2% of assessed parks) from Western Grey Kangaroos, two (1% of assessed parks) from Red Kangaroos (Mallee parks), and 17 parks (6% of assessed parks) reporting Swamp Wallaby impacts. Overabundant macropod species (Eastern Grey Kangaroo) are an increasing issue in the urban fringe area of Melbourne. The Koala is overabundant in eight parks, including Mount Eccles National Park where the impact is severe.

**Figure 3.2.9 Impact of overabundant fauna**



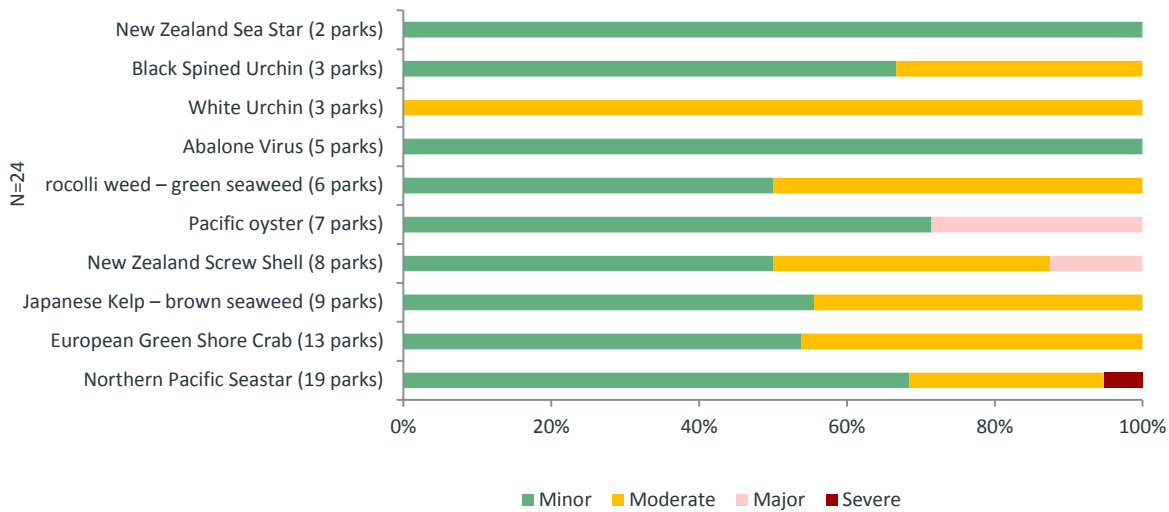
**Figure 3.2.10 Trend in impact of overabundant fauna**



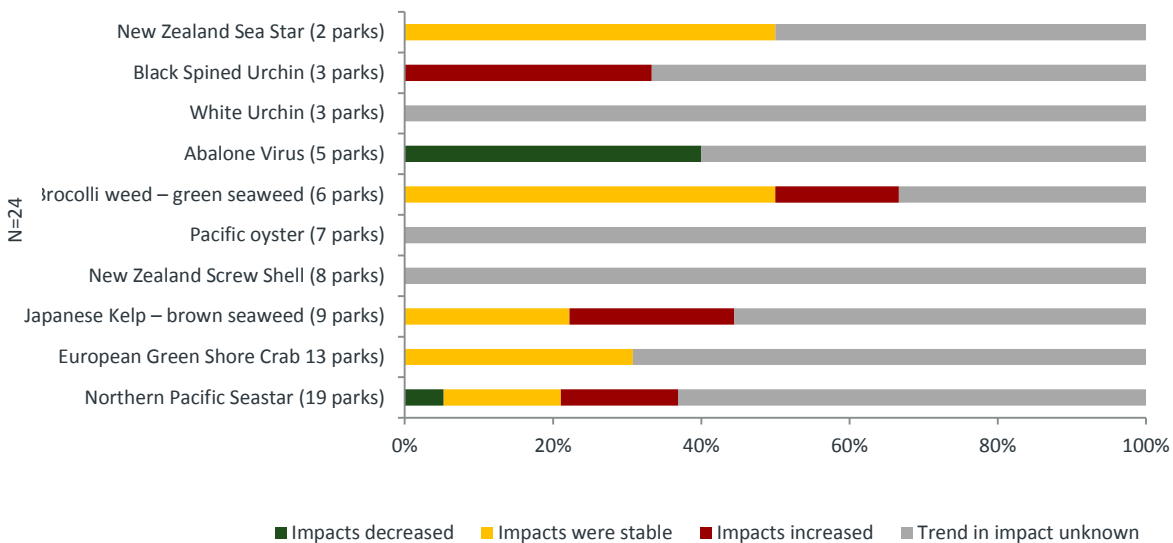
### Distribution and impact of marine pests and overabundant native species

The most widespread marine pest or overabundant marine species was the Northern Pacific Seastar which was reported in 19 parks, followed by the European Shore Crab (13 parks) and Japanese Kelp (9 parks). While the trend in marine pests and overabundant native species was unknown in the majority of parks for several species a number of parks reported increasing impacts.

**Figure 3.2.11 Impact of marine pests and overabundant species**



**Figure 3.2.12 Trend in impact of marine pests and overabundant species**

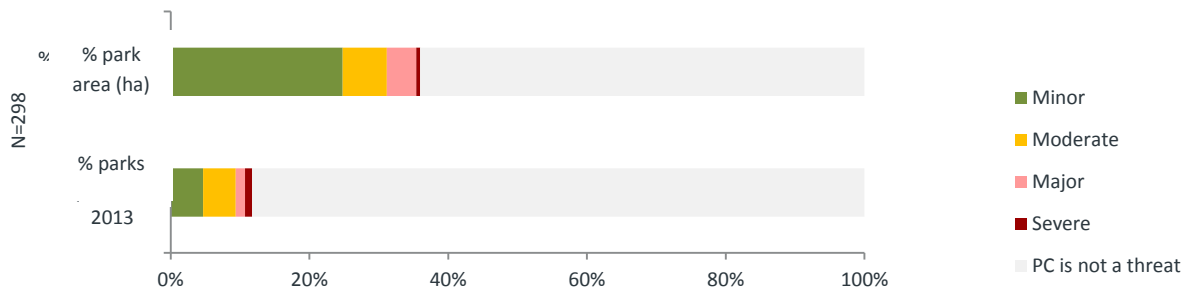


### Impact of dieback agents (*Phytophthora cinnamomi*)

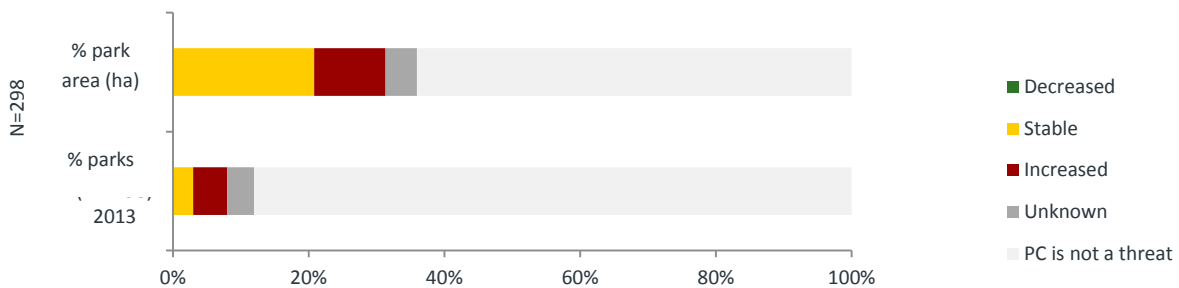
*Phytophthora cinnamomi* (PC) or Cinnamon Fungus is a pathogen that causes dieback to susceptible species. Of the 298 parks assessed, PC was reported as an issue in 11% of parks (36% of the area of the parks network). While the impact was variable, several parks (11% of the area of the parks network) reported increased impacts with no parks reporting decreased impacts.



**Figure 3.2.13 Impact of *Phytophthora cinnamomi* (Cinnamon Fungus)**



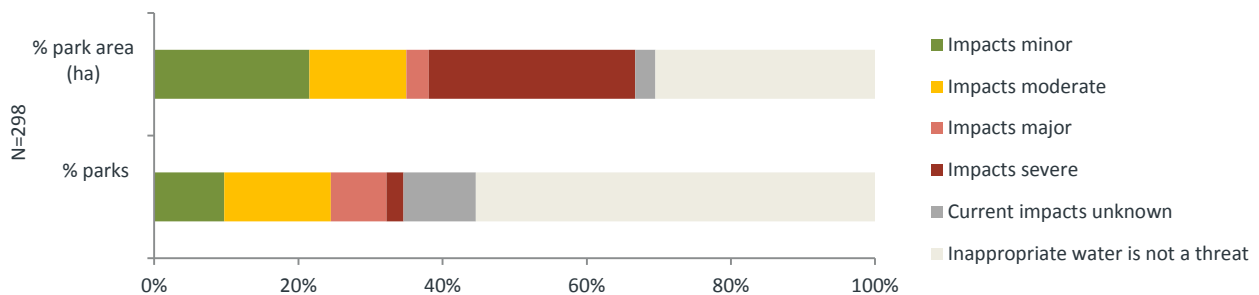
**Figure 3.2.14 Trend in impact of *Phytophthora cinnamomi* (Cinnamon Fungus)**



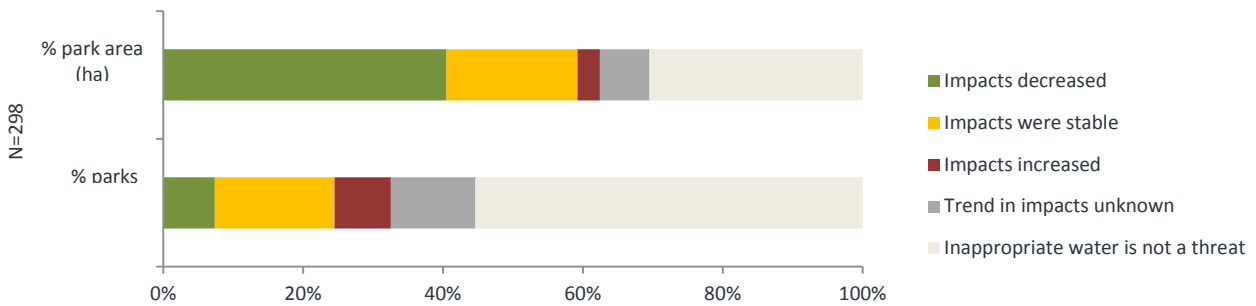
**Impact of inappropriate water regime**

Inappropriate water regimes refers to the volume, frequency and patterns of water flows and water quality. Of the 298 parks assessed 45% (70% of the area of the parks network) reported that inappropriate water regime was an issue for the park. Ten percent of parks (32% of the area of the parks network) reported that the impact on natural values was major or severe. Seven per cent of parks (41% of the area of the parks network) reported that inappropriate water regime impacts had decreased since 2010, which is consistent with the breaking of the millennium drought.

**Figure 3.2.15 Impact of inappropriate water regime**



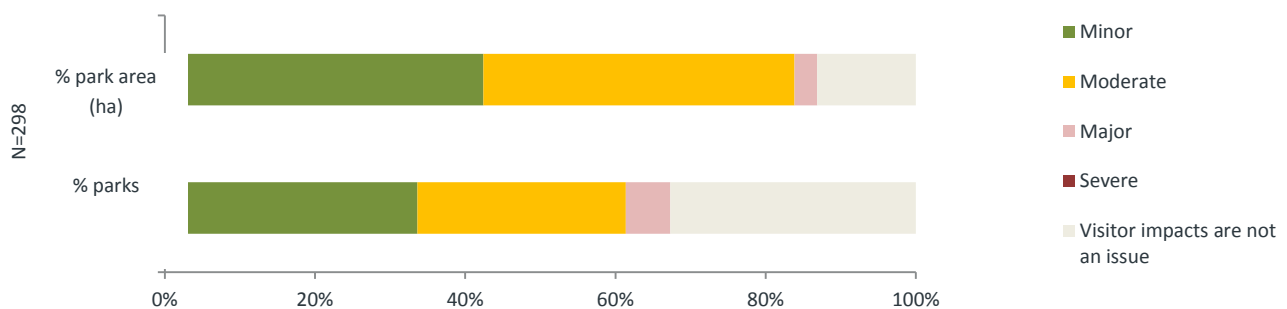
**Figure 3.2.16 Trend in impact of inappropriate water regime**



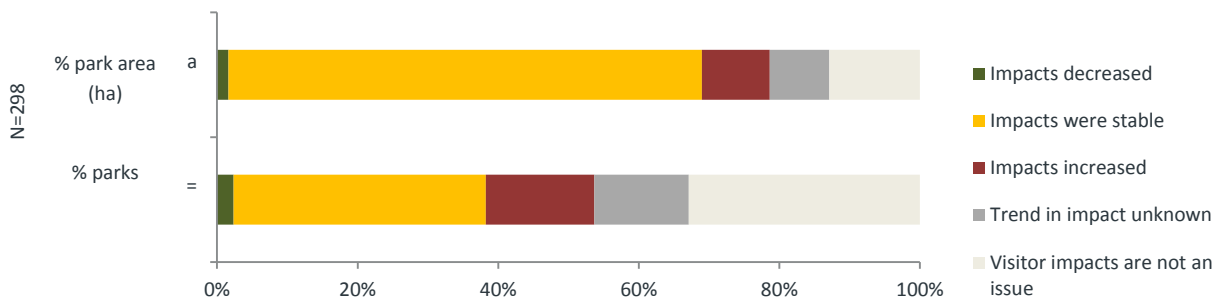
**Visitor impacts on natural values conservation**

Some recreational uses can have a detrimental impact on ecosystem health. Of the 298 parks assessed, 67% of parks (86% of the area of the parks network) reported that the impact of visitor activities were an issue for the park, with 34% (42% of the area of the parks network) reporting minor impact and 6% reporting major impact (3% of the area parks network). Fifteen per cent of parks (10% of the area of the parks network) reported that the impact from visitor activities was increasing and 2% of parks (2% of the area of the parks network) reported decreasing impact.

**Figure 3.2.17 Impact of visitors on natural values conservation**



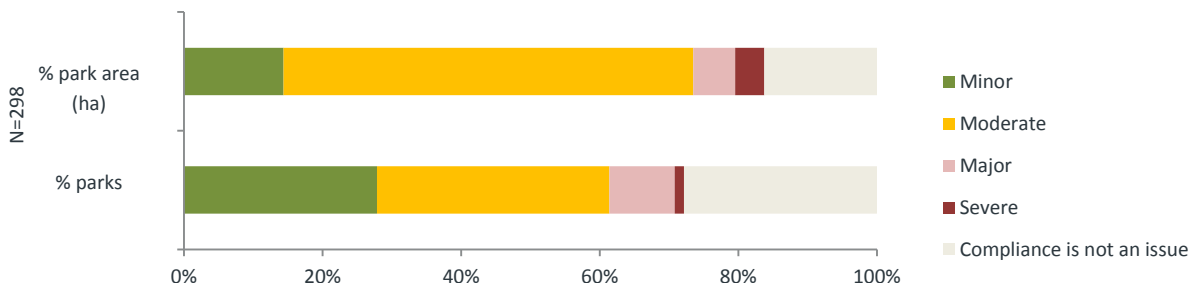
**Figure 3.2.18 Trend in impact of visitors on natural values conservation**



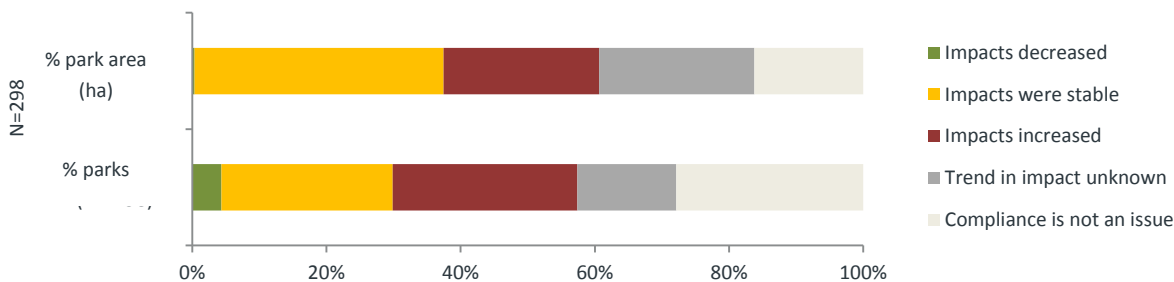
**Non-compliance (illegal activity) impacts on natural values conservation**

Of the 298 parks assessed 72% reported that the impact from non-compliance (illegal activities) was an issue for the park with 10% of parks (10% of the area of the parks network) reporting major or severe impact. Significantly more parks reported increasing impacts from non-compliance than decreasing impact with 28% of parks (23% of the area of the parks network) reporting increasing impact.

**Figure 3.2.19 Impact of non-compliance (illegal activities) on natural values conservation**



**Figure 3.2.20 Trend in impact of non-compliance (illegal activities) on natural values conservation**



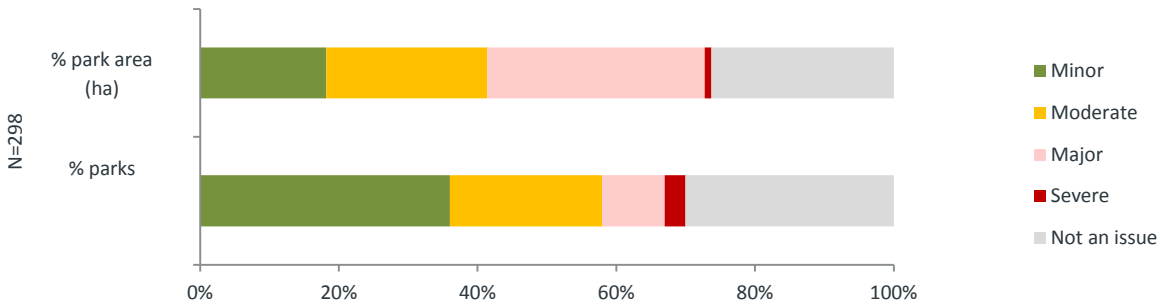
### Fire impact on nature conservation values

Of the 298 parks assessed 69% reported that the impact of fire frequency and severity was an issue for the park with 12% of parks (32% by area of parks network) reporting major or severe impacts on natural values. Fifteen per cent of parks (37% by area of the parks network) reported that impact was increasing. More parks reporting increasing impacts than decreasing impacts.

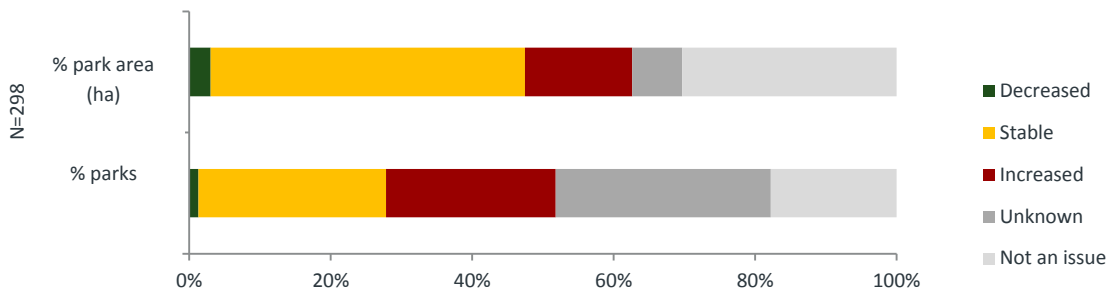
The impact of fire on ecosystems can be measured through both the Tolerable Fire Intervals (desirable inter-fire periods) and the Vegetation Growth Stages. Due to a number of large fires over the past decade there are significant areas of the parks network that are currently outside their tolerable fire intervals and young growth stages.

See Appendix 3.15 (map of Tolerable Fire Interval Status for Native Vegetation on Parks Land) and Appendix 3.16 (map of Native vegetation growth stages post 2013 fire season).

**Figure 3.2.21 Impact of fire on natural values**



**Figure 3.2.22 Trend in impact of fire on natural values**

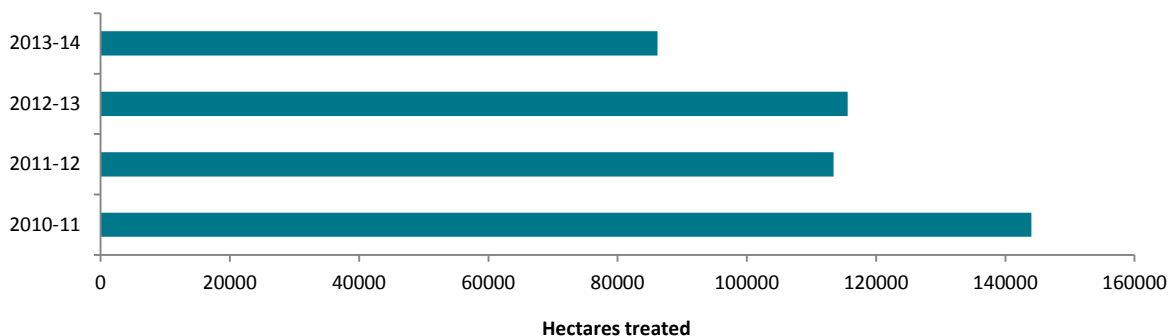


### Management response to key threats

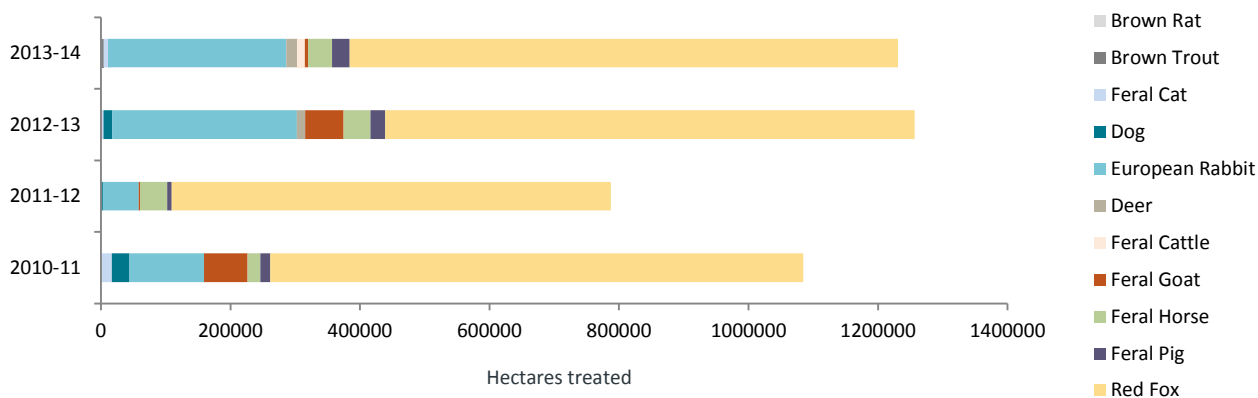
#### Area treated for pest plants and animals

Weed and pest animal control are the most common conservation management activities across the parks network. The total area of weed control declined between 2010 and 2013 while the area of pest animal management was relatively stable at approximately one million hectares. This is largely due to a number of landscape scale introduced predator and grazer control programs undertaken in partnership with DELWP (Southern Ark, Glenelg Ark, Grampians Ark, Mallee Bounceback) through the Weeds and Pests on public Land initiative.

**Figure 3.2.23 Area (Ha) treated for weeds.**



**Figure 3.2.24 Area treated (ha) for pest animals, broken down by targeted species.**



### Extent objectives met in managing key threats

Objectives for key threats can include prevention, eradication, containment and asset protection. Based on assessments by park managers of available knowledge, the degree to which threat management objectives were met varied according to the threat type. The extent to which management objectives can be met is due to a range of factors including available control methods, drivers such as climate and available resources and skills.

Across the assessed parks at least half fully or substantially met their weed and fire management objectives. However less than one-third of parks fully or substantially met management objectives for a number of other key threats such pest animal management and non-compliance. For management of *Phytophthora dieback* (PC), 52% of parks reported that management objectives were not being met. Section 3.3 Condition of park ecosystems describes the key factors that influenced the status and management of key threats and resulting park condition.

**Figure 3.2.2.25 Extent management objectives met for key threats**

