State Plan target

By 2015 there is an increase in the number of sustainable populations of a range of native fauna species.

Background

New South Wales has experienced severe declines and extinctions of a broad suite of native fauna since European settlement, with 26 species of mammals, 12 species or subspecies of birds, one species of reptile, one marine fish and one invertebrate listed as presumed extinct under threatened species legislation. The introduction of exotic predators (cats, foxes and rats) and herbivores (rabbits, goats and sheep), clearing and disturbance of native vegetation, changes to fire regimes, changes to water flows, the introduction of exotic diseases, overfishing and fishing by-catch are likely to have been the major causes of fauna declines.

Within the Hunter–Central Rivers region, none of the 658 species of terrestrial vertebrates recorded since European settlement have become extinct. However, 12 species (14 per cent) of mammals, 39 species (10 per cent) of birds, four species (seven per cent) of amphibians and 28 species (24 per cent) of reptiles are estimated to have lost at least half of their pre-European distribution (Figure 1).
Amphibians 55 species
Birds 403 species
Mammals 83 species
Reptiles 117 species

Figure 1  Distribution loss ($\Delta D$) of amphibians, birds, mammals and reptiles in the Hunter–Central Rivers region since European settlement

Map of the catchment

Hunter – Central Rivers

Assessment

Condition

Indicators: sustainability of terrestrial vertebrate species

The sustainability (condition) of individual terrestrial vertebrate species within the region was assessed using modified IUCN Red-List Criteria (IUCN 2001). In particular, estimates of total population size and distribution, trends in population size and distribution over time, and direct estimates of extinction risk from population modelling were used to score sustainability for each species at the regional scale. Species were assessed only if they were being actively monitored at a regional or larger scale. Species were scored as data deficient if the uncertainty in the assessment was large. As a result, relatively few species have been assessed, but confidence in most of the assessments is medium to high. Given that this is the first such assessment of the sustainability of terrestrial vertebrates at the regional scale, data on trends in sustainability is not available.

In the Hunter–Central Rivers region, three species (four per cent) of mammals, 80 species (20 per cent) of birds, no amphibians and no reptiles were monitored adequately to assess sustainability (Figure 2). The relatively large number of assessments for birds reflects the large number of surveys conducted across much of NSW as part of Birds Australia’s Atlas of Australian Birds project. Two of the three assessable mammals are threatened species subject to targeted monitoring. Of all
assessable species within the Hunter–Central Rivers region, 16 (20 per cent) scored good or very good for sustainability. By comparison, 76 species (35 per cent of assessable species) across NSW scored good or very good for sustainability.

| Amphibians | 55 species
| Birds | 403 species
| Mammals | 83 species
| Reptiles | 117 species
| All |

Confidence medium to high (in species assessed)
Trend ? (this is baseline data – no trend is available until assessment is repeated)

**Figure 2** Sustainability of amphibians, birds, mammals and reptiles within the Hunter–Central Rivers region, assessed using modified IUCN Red-List Criteria (numbers are sustainability scores used in the sustainability assessments)

**Index of fauna sustainability**

An index of fauna sustainability was calculated as the mean of sustainability scores for all individual species that were able to be assessed. Although scores for individual species are categorical rather than continuous, the mean will reflect net changes in the sustainability of individual species over time. The index is biased towards the groups of species for which there is the most data (birds). It is the objective of the fauna program of the NSW Natural Resources monitoring, evaluation and reporting strategy to increase the number of assessable species.

| Fauna sustainability | 2.6 |
| Confidence | low |
| Trend | ? |

**Pressures**

The major causes of historical declines in native fauna remain the major pressures on sustainability. These are:

- the introduction of exotic predators (see also the invasive species report)
- the introduction of exotic herbivores and overgrazing by exotic and native herbivores (see also the invasive species report)
- the clearing and disturbance of native vegetation (see also the native vegetation report)
- changes to fire regimes
- changes to water flows (see also the riverine ecosystems, groundwater dependent ecosystems, and wetlands reports)
- the introduction of exotic diseases
- overfishing and fishing by-catch (see also the marine waters and ecosystems report).
The interaction between these pressures and their impacts on native fauna is complex and cannot be easily summarised. For example, cats and foxes have been linked to more extinctions of fauna in NSW than any other factor and they remain a threat to most ground-dwelling species across the state. Nevertheless, the impacts of cats and foxes vary greatly between species and at different times, and are influenced by environmental factors. Moreover, impacts are not closely related to density; low numbers of cats and foxes can have devastating impacts on highly-vulnerable species at certain times. Thus changes in the threat posed by cats and foxes cannot be readily mapped or monitored through time at a regional scale. This difficulty applies to deriving indicators for most of the other major pressures on fauna. In the absence of such indicators, case studies of impacts and/or management responses can provide useful insight.

**Pressure and response case study: foxes in the Hunter-Central Rivers region**

The introduction of the red fox (*Vulpes vulpes*) into Australia in the 1870s has contributed to severe declines and extinctions of a broad range of native fauna, particularly among medium-sized (450–5000 g) ground-dwelling and semi-arboreal mammals, ground-nesting birds and freshwater turtles. Foxes are now widespread across the continent and eradication is not possible in the immediate future. However, the impacts of foxes on native fauna can be reduced substantially by intensive broad-area (across-tenure) fox control targeting areas where native species vulnerable to fox predation persist. The NSW Fox Threat Abatement Plan (Fox TAP) establishes priorities for fox control across all land tenures, by identifying which native species are at greatest risk from fox predation and at which sites fox control for these species is most critical. Eight priority sites for fox control have been identified within the Hunter–Central Rivers region, targeting brush-tailed rock wallabies, rufous bettong, broad-toothed rats, little terns and beach-stone curlew. Fox control has increased breeding success of little terns significantly (see Figure 3). Brush-tailed rock wallabies have not responded to fox control, in part because of the difficulties in controlling foxes in areas of complex land tenure. The responses of the other target fauna to fox control are less clear but all species are persisting in target areas.

**Figure 3** Fox control has increased the breeding success of little terns significantly (data: Mahon & Lassau, unpublished)
Management activity

State level

The native fauna target is being addressed at the state level through the protection of critical habitat, control or eradication of priority pest animals, regulation of native vegetation clearing and urban development, and undertaking research on fire regimes. Some threats, most notably those posed by cats and chytrid fungus, remain largely unaddressed due to the lack of effective control techniques.

Some specific activities include:

- control of pest animals, through:
  - targeted cross-tenure control of foxes in priority areas through the NSW Fox TAP (NB state-wide control is not achievable with current methods)
  - broad-scale rabbit control through the release of myxomatosis and rabbit haemorrhagic disease
  - the eradication of rats, mice and rabbits from several NSW islands
- habitat protection, through:
  - the regulation of the clearing of native vegetation on rural lands and harvesting of timber on forestry lands, and consideration of important habitat corridors in planning for urban development
  - dedication of about 8.4 per cent of NSW as conservation reserve
  - specifically managing about 2.2 per cent of private and other public lands in NSW for conservation under Wildlife Refuges and Conservation Agreements
  - incentive programs to improve vegetation condition and extent through replanting and grazing management on private lands (but these are often small scale)
  - environmental flow allocations for water
- research, including:
  - researching the relationships between fire and the population dynamics of a range of Australian flora and fauna, allowing optimal fire regimes for threatened taxa to be considered in fire planning.

Regional level

At the regional level, the Hunter–Central Rivers Catchment Management Authority (CMA) is undertaking several activities in relation to the native fauna target (many of the actions for native vegetation will also contribute to native fauna targets since vegetation condition is a key surrogate for terrestrial habitat quality). These actions include:

- working with landholders to protect existing good quality native vegetation as well as regenerating degraded native vegetation, with priority given to protecting good quality vegetation located in strategic areas across the region
- pest animal actions in key locations to reduce the pressures of pests on native fauna, such as the fox management project that is protecting rock wallabies and little terns in a number of areas across the region
- flagship project, the Kooragang wetland rehabilitation project, which is protecting and rehabilitating key saltmarsh and mangrove habitats in the lower Hunter Estuary for a range of threatened species, particularly internationally significant migratory waders and shorebirds.

**Local level**

There are a number of other groups undertaking significant work in the region that is contributing to better outcomes for native fauna. These groups include:

- Hunter Koala Preservation Society, which is protecting koalas and their habitat in the Port Stephens area
- Hunter Wetlands Centre Australia, which is developing and protecting Ramsar wetland habitat for a range of migratory wader and shorebird species.

**Further reading**