Parks Victoria Signs of Healthy Parks Summary

Subtidal Reef Monitoring at Port Phillip Heads Marine National Park

March 2014

Background

Shallow reef habitat covers extensive areas along the Victorian coast and is dominated by seaweeds, mobile invertebrates and fishes. To effectively manage and conserve these important and biologically rich habitats, the Victorian Government established a long-term Subtidal Reef Monitoring Program (SRMP) on reefs located throughout Victoria.

Port Phillip Heads Marine National Park is located in the entrance to Port Phillip Bay and includes a diverse range of reef habitats from highly exposed open coast, to enclosed bays subject to fast tidal currents and deep canyons. The unique habitats in the area are known to be a biodiversity hotspot for seaweeds, sponges, hydroids and bryozoans.

Aims

The Subtidal Reef Monitoring Program provides long-term monitoring of biological communities and populations at a range of sites inside and outside the Marine National Park. The program is designed to:

- detect important community and population changes over time;
- provide data on species associations and ecosystem processes;
- identify any unusual biological phenomena, such as any disease events or pest infestations;
- provide indicators for assessing the status of the Marine National Park and implementing management procedures.

The methods involve scientific diver surveys of fish, invertebrates and seaweeds. The surveys commenced in May 1998 with the 15th survey completed in March 2014.

Figure 1. Juvenile magpie morwong *Cheilodactylus nigripes* in mixed brown algal habitat, February 2014.

Parks Victoria Healthy Parks Healthy People

State Government Victoria

Australian Marine Ecology

Results

- Seaweed species richness and diversity has been relatively high since 2002.
- There was a substantial reduction in the abundance of the canopy forming crayweed *Phyllospora comosa*, thallose red algal species, erect coralline algae and crustose coralline algae between 2010 and 2014.
- There was no change in the abundance of green algae and seagrass *Amphibolis antarctica* since 2006.
- There was a decline in the abundance of giant kelp *Macrocystis pyrifera* from 1998 to 2002, after which it was largely absent.
- Substantial changes in invertebrate community structure occurred between 2010 and 2014, including a reduction of the total abundance and species richness.
- Since 2009, there have been substantial declines in abundances of blacklip abalone *Haliotis rubra*, common sea urchin *Heliocidaris erythrogramma*, biscuit star *Tosia australis* and Gunn's seastar *Meridiastra gunnii*.
- The abundance of blacklip abalone *Haliotis rubra* increased following park declaration in 2002 to a peak in 2009. The mean size also increased inside the park. The decline in abundance from 2009 was not matched by a reduction in size, indicating the decline was an ecological response rather than from harvesting.
- The abundance of greenlip abalone *Haliotis laevigata* increased inside the park to levels greater than outside the park (Figure 2). Mean sizes were highly variable over time with no distinct increase to date.
- Fish community composition and species abundances have generally not differed appreciably inside the park, compared with reference sites since declaration of the park.
- The biomass of fished species was closely matched inside and outside the park for monitoring up to 2010. In 2014, biomass was appreciably higher inside the park.
- The western blue groper *Achoerodus gouldii* was observed at sites inside the park in 2014, with prior sightings also having occurred in 2004 and 2006.
- Dieback of common kelp *Ecklonia radiata* was observed in patches at many sites in 2009, with substantial recovery by 2010.
- A small Japanese kelp *Undaria pinnatifida* plant was observed in a dieback area at Point Franklin in 2009, none were observed subsequently.

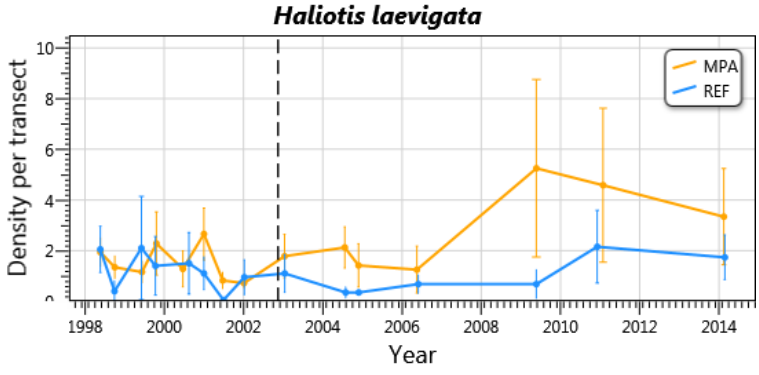

Figure 2. Greenlip abalone *Haliotis laevigata* abundance has increased to higher levels inside the National Park.

Implications

The management implications of the findings include:

- The 16 years of monitoring data is invaluable in understanding reef systems.
- The Park is having a positive effect on fished populations.
- There is a major community shift occurring in the area and the 2015 survey will be crucial in determining the extent and implications of the changes.

Reference

Edmunds M, Woods B and Donnelly D (2014) Victorian Subtidal Reef Monitoring Program: The Reef Biota at Port Phillip Heads Marine National Park, March 2014. Parks Victoria Technical Series. Parks Victoria, Melbourne.

More information

Visit www.parks.vic.gov.au or call 13 1963.

Prepared date

21 January 2015