



Student research grants for threatened, protected and rare fish and marine vegetation in NSW

Information for applicants



Published by the NSW Department of Primary Industries

Student research grants for threatened, protected and rare fish and marine vegetation in NSW- Information for applicants

First published October 2016

Author: Fisheries Scientific Committee www.fsc.nsw.gov.au

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (October 2016). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the Department of Primary Industries or the user's independent adviser.

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Background

The Fisheries Scientific Committee (FSC) is established under Part 7A of the *Fisheries Management Act 1994* (the Act), as an independent scientific body. One of the main functions of the FSC is to assess nominations for listing (or de-listing) threatened species, threatened populations and endangered ecological communities of fish (as defined under the Act) and marine vegetation. The FSC also assesses the listing of key threatening processes (KTPs). At times, this task is made difficult by the absence of important scientific data on species distribution, abundance, habitat and ecology. This information is also important for the preparation of the Priority Action Statement and Recovery Plans by the NSW Department of Primary Industries.

The FSC will award research funding totalling \$3,000 aimed at filling gaps in research information for threatened (or potentially threatened), protected and rare species of fish and marine vegetation in NSW. Grants are intended for use by undergraduate third-year major project students, or as part of an Honours, Masters or PhD project.

Applicants may wish to propose a project based on:

- 1) a species identified in this guide as having a specific research gap in NSW;
- 2) a species of fish (as defined under the Act) or marine vegetation listed as either threatened or protected in NSW; or
- 3) a species of fish (as defined under the Act) or marine vegetation that has not been mentioned but that the applicant thinks may be under threat in NSW and adequate information is not available.

Grant applications addressing points 1 and 2 above will be considered as the highest priority by the FSC. Applications falling into point 3 however, are also encouraged, but should be accompanied by evidence of threat to the species. Grants will not be issued for work on common or alien species or to students applying from institutions outside Australia.

APPLICATIONS CLOSE 17th February 2017

Please note: Late applications will not be accepted.

Research priorities

The following species and species groups are identified as having significant research gaps relating to their distribution, abundance, habitat or ecology. Grant applications addressing research gaps for these species will be given the highest priority.

- Alpine Redspot Dragonfly - *Austropetalia tonyana*
- Aquatic fauna of the artesian springs ecological community in the Great Artesian Basin
- Australian Grayling - *Prototroctes maraena*
- Cauliflower Soft Coral – *Dendronephthya australis*
- Fitzroy Falls Spiny Crayfish - *Euastacus dharawalus*
- Flathead Galaxias - *Galaxias rostratus*
- Great Hammerhead Shark - *Sphyrna mokarran*
- Greynurse Shark- *Carcharias taurus*
- Macquarie Perch – *Macquaria australasica*
- Marine Slug - *Smeagol hilaris*
- Murray Hardyhead – *Craterocephalus fluviatilis*
- Olive Perchlet – *Ambassis agassizii*
- Oxleyan Pygmy Perch – *Nannoperca oxleyana*
- Scalloped Hammerhead Shark - *Sphyrna lewini*
- Stocky Galaxias – *Galaxias tantangara*
- The Seagrass – *Posidonia australis*

Alpine Redspot Dragonfly

Scientific name: *Austropetalia tonyana*

Family or group: Austropetaliidae

Status: Vulnerable

Research gap:

The Alpine Redspot Dragonfly is one of only three species in the genus *Austropetalia* which are all endemic to Australia. It is a rare species, thought to be restricted to extremely specific habitat areas in the higher altitudinal areas of south-eastern Australia. Due to its specialised habitat requirements and restricted geographic distribution, very little is known about the Alpine Redspot Dragonfly. Anthropogenic threats continue to degrade suitable habitat for the species, raising concerns for its future conservation status. The FSC considers it a high priority to undertake targeted surveys of this species to determine its distribution and abundance.

Aquatic fauna of the artesian springs ecological community in the Great Artesian Basin

“The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin” is listed as endangered under the *Environment Protection Biodiversity Conservation Act 1999*. Furthermore, “the artesian springs ecological

community in the Great Artesian Basin” is listed as a critically endangered ecological community under the *Threatened Species Conservation Act 1995*.

The Fisheries Scientific Committee seeks data on the aquatic faunal communities associated with these springs.

Australian Grayling

Scientific name: *Prototroctes maraena*

Family or group: Retropinnidae

Status: Endangered

Research gap:

Populations of Australian Grayling in NSW have declined substantially, with a substantial southward range contraction and a decline in prevalence at sites occupied as recently as the mid-1990s. The species is obligately diadromous, with adults occupying freshwater habitats, spawning occurring in the lower freshwater reaches of rivers and then larvae occupying marine habitats for 5 - 6 months before migrating back into freshwaters where they remain for the remainder of their lives. Almost nothing is known about their biology during the marine phase of the life cycle. It is suspected that much of the decline in grayling populations is a result of climate induced changes in temperature, river discharge (particularly in autumn-winter) and oceanography. However, it is also likely that climate change and fishery induced changes in marine food webs are impacting on the species during its marine larval phase. Any research that investigates any aspect of the marine phase of the life cycle and/or quantifies the scale of threatening processes is of value. Information on the susceptibility of the species to common fish pathogens may also be informative.

Cauliflower Soft Coral

Scientific name: *Dendronephthya australis*

Family or group: Nephtheidae

Status: Nil - potentially threatened

Research gap:

This species of soft coral is endemic to NSW and is only known to occur in Port Stephens and Sydney Harbour. The Port Stephens population has declined significantly in recent years as a result of smothering by sand. The FSC considers it a high priority to determine the distribution of the species in Sydney Harbour and in any other locations in NSW.

Fitzroy Falls Spiny Crayfish

Scientific name: *Euastacus dharawalus*

Family or group: Parastacidae

Status: Critically endangered

Research gap:

The Fitzroy Falls Spiny Crayfish is endemic to NSW and is only known to occur in Wildes Meadow Creek, a sub-catchment of the Shoalhaven River. The common yabby (*Cherax destructor*) has invaded this waterway and is believed to impact upon the spiny crayfish. The FSC considers it a high priority to collect data on the basic biological attributes of the Fitzroy Falls Spiny Crayfish (e.g. population size, age at first breeding, longevity, movement) and determine the feasibility of potential captive breeding-reintroduction or translocation programs to mitigate the risk of extinction.

Flathead Galaxias

Scientific name: *Galaxias rostratus*

Family or group: Galaxiidae

Status: Critically endangered

Research Gap:

Little is known about the biology and ecology of Flathead Galaxias. This species has declined dramatically across all of its former range. The FSC has a particular interest in understanding the factors that led to declines and that may be inhibiting population recovery, as well as general life history, habitat requirements, fecundity, reproductive biology and movements. The FSC continues to monitor the status of the species and requires up to date information on the current distribution and abundance for the species. Recent reports of the species in NSW have all been from floodplain wetland habitats. Wetland habitats have generally been poorly surveyed by past and current fish community sampling within the Murray-Darling Basin. The FSC considers it a high priority to undertake targeted surveys of these habitats using standardised sampling procedures in order to more effectively assess the status of Flathead Galaxias in NSW.

Great Hammerhead Shark

Scientific name: *Sphyrna mokarran*

Family or group: Sphyrnidae

Status: Vulnerable

Research gap:

Great Hammerhead Sharks are highly migratory species inhabiting tropical and warm temperate seas globally. While rare in NSW waters, data that do exist suggest that several processes are threatening to these sharks in NSW. The FSC is interested in historical data assessing the prevalence of Great Hammerhead Sharks in NSW waters, and any life-history data on the species that would facilitate conservation and management of this species in NSW.

Greynurse Shark

Scientific name: *Carcharias taurus*

Family or group: Odontaspidae

Status: Critically endangered

Research gap:

Greynurse Sharks have experienced substantial declines in NSW waters. Despite protection in 1984, the species has not shown a significant increase in population size. The FSC is interested in new research on general life history, habitat requirements, fecundity, reproductive biology and movements of this species.

Macquarie Perch

Scientific name: *Macquaria australasica*

Family or group: Percichthyidae

Status: Endangered

Research Gap:

Macquarie Perch populations continue to decline in catchments in the Murray-Darling

Basin and remain in a threatened state to various degrees in coastal catchments. The causes of the decline of Macquarie Perch are likely to include sedimentation, water extraction, overfishing, Epizootic Haematopoietic Necrosis Virus (EHNV), spawning failures due to cold water pollution, barriers to migration, habitat degradation and competition with and predation by introduced fish species.

Important research needed on the species includes:

- Identifying factors associated with recruitment failure (or success) within a Macquarie Perch population.
- Behavioural and trophic (predation) interactions with introduced salmonids.

Marine Slug

Scientific name: *Smeagol hilaris*

Family or group: Smeagolidae

Status: Critically endangered

Research gap:

This species of marine mollusc is only known from a single location on the south coast of NSW. Even within that location, its habitat is limited. *Smeagol* sp. is restricted to the upper littoral zone of gravel or cobble beaches. The FSC considers it a high priority to identify potentially viable habitats for *Smeagol* and if possible to survey these habitats for the species.

Murray Hardyhead

Scientific name: *Craterocephalus fluviatilis*

Family or group: Atherinidae

Status: Critically endangered

Research Gap:

Recent research on remnant populations in Victoria and South Australia suggest that Murray Hardyhead have specific habitat requirements and are largely specialists residing in saline floodplain wetlands of the Murray-Darling Basin. These habitat types have been largely un-surveyed by past and current fish community sampling within the Murray-Darling Basin. The FSC considers it a high priority to undertake targeted surveys of these habitats using standardised sampling procedures in order to more effectively assess the status of Murray Hardyhead in NSW (as well as other taxa co-existing with them in these specific ecosystems).

Olive Perchlet

Scientific name: *Ambassis agassizii*

Family or group: Ambassidae

Status: Endangered western NSW population

Research gap:

Little is known about the biology and ecology of Olive Perchlet in the Murray-Darling Basin. The FSC has a particular interest in understanding the factors that led to population declines and that may be inhibiting population recovery, as well as general life history, habitat requirements, fecundity, reproductive biology and movements. The FSC continues to monitor the status of the endangered population and requires up to date information on the current distribution and abundance for the species.

Oxleyan Pygmy Perch

Scientific name: *Nannoperca australis*

Family or group: Percichthyidae

Status: Endangered

Research gap:

Oxleyan pygmy perch have specialised habitat requirements and are confined to wallum heath upon the coastal plain on northern NSW. Surveys by NSW DPI in 2012 suggested that the population has declined in prevalence and abundance. The FSC considers it a high priority to undertake targeted surveys of the species to quantify changes in its distribution and abundance.

Scalloped Hammerhead Shark

Scientific name: *Sphyrna lewini*

Family or group: Sphyrnidae

Status: Endangered

Research gap:

Scalloped Hammerhead Sharks are often confused with *Sphyrna zygaena* (the Smooth Hammerhead Shark), particularly in the tropics, leading to species misidentification. This has caused confusion in data specific information on both species as historically both species were combined under the umbrella term “hammerhead”. In light of this, the FSC has particular interest in genetic confirmation of current Scalloped Hammerhead Shark catches in NSW. The FSC is also interested in any population genetic studies, or research on ageing or other life-history aspects that would facilitate conservation and management of this species in NSW

Stocky Galaxias

Scientific name: *Galaxias tantangara*

Family or group: Galaxiidae

Status: Critically endangered

Research Gap:

Almost nothing is known about the biology and ecology of Stocky Galaxias. A recently described species, it is only known from a single population in a sub-catchment above Tantangara Reservoir in southern NSW, where the major threat is invasion by trout. The sub-catchment has not been thoroughly surveyed, and information is required on whether additional populations of Stocky Galaxias or trout-free waters for reintroduction are present. The FSC is also interested in general life history, habitat requirements, fecundity, reproductive biology and movements of this species.

The Seagrass

Scientific name: *Posidonia australis*

Family or group: Posidoniaceae

Status: Endangered populations – Port Hacking, Botany Bay, Sydney Harbour, Pittwater, Brisbane Water and Lake Macquarie.

Research gap:

Posidonia australis populations are found in 18 estuaries along the NSW coast. Large

losses in distribution of *P. australis* have apparently occurred in the endangered populations in the early 20th century. Although the species does reproduce sexually, it is rare to see new recruits in NSW estuaries. The genetic affiliations of populations within NSW are not well understood. Suitable projects might include investigating the factors that limit recruitment of *P. australis* (e.g. predation of seedlings), and resolving the genetic diversity of *P. australis* along the NSW coast.

Other research gaps

Other Shark Species

Information is lacking for many species of sharks in NSW. In addition to the already listed threatened shark species, the FSC is interested in studies relating to Smooth Hammerhead, Dusky Whaler, Bull, Sandbar, Longfin Mako and Shortfin Mako sharks. The FSC considers it a priority to undertake targeted surveys of these species, or other potentially threatened shark species, to assess their status in NSW waters.

Research on physical processes affecting threatened species

There are several processes that affect, or have the potential to affect, the abundances and recovery of threatened aquatic species and populations. The most recent high-profile example is climate change and associated changes in water temperatures, distributions of species, sea-levels, etc. Other processes include environmental flows in rivers, impacts of pollution from land run-off and point-sources. The FSC is interested in supporting projects that address such processes and how they influence threatened aquatic species and populations.

Table 1: The current list of threatened species, populations and ecological communities in NSW

| Critically endangered species | |
|---|------------------------------|
| <i>Carcharias taurus</i> (Rafinesrue, 1810) | Greynurse Shark |
| <i>Craterocephalus fluviatilis</i> (McCulloch, 1913) | Murray Hardyhead |
| <i>Euastacus dharawalus</i> (Morgan, 1997) | Fitzroy Falls Spiny Crayfish |
| <i>Galaxias rostratus</i> (Klunzinger, 1872) | Flathead Galaxias |
| <i>Galaxias tantangara</i> (Raadik, 2014) | Stocky Galaxias |
| <i>Nereia lophocladia</i> (Agardh, 1897) | Marine Brown Alga |
| <i>Notopala hanleyi</i> (Frauenfeld, 1864) | Hanley's River Snail |
| <i>Notopala sublineata</i> (Conrad, 1850) | Darling River Snail |
| <i>Smeagol hilaris</i> (Tillier & Ponder, 1992) | Marine Slug |
| Endangered species | |
| <i>Archaeophya adamsi</i> (Fraser, 1959) | Adams Emerald Dragonfly |
| <i>Austrocordulia leonardi</i> (Theischinger, 1973) | Sydney Hawk Dragonfly |
| <i>Maccullochella ikei</i> (Rowland, 1986) | Eastern Freshwater Cod |
| <i>Maccullochella macquariensis</i> (Cuvier, 1829) | Trout Cod |
| <i>Macquaria australasica</i> (Cuvier, 1830) | Macquarie Perch |
| <i>Mogurnda adspersa</i> (Castelnau, 1878) | Purple-Spotted Gudgeon |
| <i>Nannoperca australis</i> (Gunther, 1861) | Southern Pygmy Perch |
| <i>Nannoperca oxleyana</i> (Whitley) | Oxleyan Pygmy Perch |
| <i>Prototroctes maraena</i> (Gunther, 1864) | Australian Grayling |
| <i>Sphyrna lewini</i> (Griffith & Smith, 1834) | Scalloped Hammerhead Shark |
| Vulnerable species | |
| <i>Bidyanus bidyanus</i> (Mitchell, 1838) | Silver Perch |
| <i>Branchinella buchananensis</i> (Geddes, 1981) | Buchanan's Fairy Shrimp |
| <i>Carcharodon carcharias</i> (Linnaeus, 1758) | White Shark |
| <i>Epinephelus daemeli</i> (Günther, 1876) | Black Rockcod |
| <i>Euastacus armatus</i> (von Martens 1866) | Murray Crayfish |
| <i>Microchestia bousfieldi</i> (Lowry & Peart, 2010) | Bousfields Marsh-Hopper |
| <i>Sphyrna mokarran</i> (Ruppell, 1837) | Great Hammerhead Shark |
| Endangered populations | |
| Murray-Darling Basin population of <i>Tandanus tandanus</i> (Mitchell, 1838) | Eel-Tailed Catfish |
| Population of <i>Posidonia australis</i> (Hook.f.,1858) seagrass in Port Hacking, Botany Bay, Sydney Harbour, Pittwater, Brisbane Waters and Lake Macquarie | |
| Snowy River population of <i>Gadopsis marmoratus</i> | River Blackfish |

| | |
|---|-------------------------|
| Western NSW population of <i>Ambassis agassizii</i> (Steindachner, 1866) | Olive Perchlet |
| Darling River hardyhead population in the Hunter River catchment (Crowley & Invanstoff 1990) | Darling River Hardyhead |
| Endangered ecological communities | |
| Aquatic ecological community of the natural drainage system of the lower Murray River catchment | |
| Aquatic ecological community in the natural drainage system of the lowland catchment of the Lachlan River | |
| Aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River | |
| Aquatic ecological community in the catchment of the Snowy River in NSW | |

Protected species

Some species are protected as they are naturally rare or have become rare from over-fishing or environmental pressures. For this reason there is often insufficient information on the habitat requirements, environmental tolerances, population dynamics and other aspects of the life history and ecology of rare species. In particular the FSC is interested in the distribution and abundance of rare species, to assess species conservation status.

The current list of fish protected under section 19 of the *Fisheries Management Act 1994* is as follows. In addition, all marine vegetation is protected in NSW.

Table 2: Current list of protected fish in NSW

| Protected species | |
|---|--|
| <i>Anampses elegans</i> | Elegant Wrasse |
| <i>Chaetodontoplus ballinae</i> | Ballina Angelfish |
| <i>Crenoicus harrisoni</i> | Isopod |
| <i>Epinephelus coioides</i> | Goldspotted Rockcod, Estuary Cod |
| <i>Epinephelus lanceolatus</i> | Queensland Groper, Giant Queensland Groper |
| <i>Girella cyanea</i> | Blue Drummer, Bluefish |
| <i>Odontaspis ferox</i> | Sandtiger Shark, Herbsts Nurse Shark |
| <i>Paraplesiops bleekeri</i> | Eastern Blue Devil, Bleekers Devil Fish |
| All species of the family <i>Solenostomidae</i> | Ghostpipefish |
| All species of the family <i>Syngnathidae</i> | Pipefish, Pipehorse. Seadragon, Seahorse |
| All species of the family <i>Pegasidae</i> | Seamoth |



**STUDENT RESEARCH GRANTS FOR THREATENED,
PROTECTED AND RARE FISH AND MARINE
VEGETATION IN NSW**

APPLICATION FORM 2017

Project Details

Project title

| |
|--|
| |
|--|

Short description of the project (300 words maximum)

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|--|
| |
|--|

Objectives

| |
|--|
| |
|--|

Methods (500 words maximum)

Proposed timeline and milestones

Expected report date

Has ethics approval been granted for this project? If not, please explain

Expenditure breakdown

E.g. 1. Travel to field sites (3 trips x \$200) = \$600

What information will your study provide about NSW threatened or rare species? (200 words maximum)

Research project/studies e.g. Honours, Masters, PhD (200 words maximum)

If the research project is part of another research project/study, please outline this context.

Additional information/references

| Details of degree program and/or thesis |
|--|
| Program title: |
| University name and address: |
| Program stage (e.g. 3rd year): |

| Applicant details |
|--------------------------|
| Name: |
| Address: |
| Telephone number: |
| Email: |
| Signature: |

| Academic supervisor's name and contact details (essential) |
|---|
| Name: |
| Telephone number: |
| Email: |
| Signature: |

| Details of co-investigators |
|--|
| Names of co-investigators and their affiliated university/organisation: |

Referees (please provide at least one)

1) **Name and contact details:**

2) **Name and contact details:**

Applications are to be submitted by Friday 17th February 2017

Please email completed applications to: fsc@dpi.nsw.gov.au

Alternatively, post to:

Executive Officer

Fisheries Scientific Committee

c/- NSW Department of Primary Industries

PO Box 1305

CROWS NEST NSW 1585

Fisheries Scientific Committee Student Research Grant Terms and Conditions

- 1) The following terms and conditions apply to funding provided by the Fisheries Scientific Committee (FSC) for the purposes of funding student research projects. Additional terms and conditions may be made at the time the grant/s is awarded to the successful applicant/s, but not without prior writing.
- 2) The FSC retains the right to decide priorities for research and to award grants accordingly.
- 3) The FSC retains the right to partially fund projects for certain components of a project.
- 4) To be eligible for a research grant, applicants must have a current enrolment at a recognised Australian tertiary institution.
- 5) Grants will not be made to individuals but to the University for administration by the appropriate supervisor.
- 6) It is the FSC's intention that all funds granted will be for research purposes only and no overheads shall be taken out by the University.
- 7) Successful applicants must provide due recognition to the FSC for their financial involvement in the project, including (but not limited to) acknowledgement in any publication, seminar or talk that results from the FSC-funded research.
- 8) Successful applicants must supply the FSC with a copy of their final report within one month of the completion of the grant including details of all financial expenditure from the grant.
- 9) Failure to complete objectives set out for the grant may render the grant void and all funds awarded to be returned to the FSC.
- 10) The FSC must be notified in writing prior to any modifications made to the project or time frame and may agree to renew the term of the funding agreement.
- 11) All unused funds are to be returned to the FSC at the completion of the project.