



CSP Research Advisory Group

2 Dec 2015

Today's Agenda

Intro

Update on MPI Aquatic Environment planning process

Update on CSP Strategic statement

CSP Research Advisory Group

- Presentation on CSP Annual Summary Report
- Seabird Research
 - Participant input
- Protected Fish Research
 - Participant input
- Marine Mammal Research
 - Participant input
- Coral Research
 - Participant input

Other relevant research and activities

- Updates on medium research plans and research planning documents





Purpose and Scope of CSP RAG

December

- Review of progress in relevant research and other activities
- Identify research gaps within the CSP mandate

February

- *Prioritise research gaps*
- *Recommend to DOC prioritised research projects for the inclusion in the CSP Annual Plan*



MPI Aquatic Environment Research Planning for 2016/17

Note for CSP-RAG meeting 2 December 2015

Martin Cryer, Fisheries Management Directorate, Regulation & Assurance, MPI

Growing and Protecting New Zealand



MPI Aquatic Environment Overview: focussed on risk assessment framework

- Work already underway on risk assessments for seabirds, mammals, fish/sharks, & benthic impacts
- Hector's surveys now complete
- Work to support Maui RAG
- Sea lion TMP modelling and prey survey in 2016
- Quantitative modelling of seabird populations
- Black petrel surveys with DOC
- Graveyard done, Spirits Bay repeat survey next
- Next steps are to fill the gaps in the framework and respond to the risk assessments

MPI Aquatic Environment Overview: focussed on risk assessment framework

- Ideas from AE&B team and working groups on filling the gaps in the framework and respond to risk assessments collated
- Summarise and socialise with fisheries managers and DOC-CSP (starting this week)
- Document and discuss with stakeholders (starting with a meeting on 11 December?)
- All contextualised with 4-yr plan

CSP Strategic Statement 2015 refresh

- Routine review
- Minor terminology changes
- Updated references to other documents (particularly appendices)
- Details of prioritisation methods





CSP Objectives

- A: Proven mitigation strategies are in place to avoid or minimise the effects of commercial fishing on protected species across the range of fisheries with known interactions.
- B: The nature of direct effects of commercial fishing on protected species is described.
- C: The extent of known effects of commercial fishing on protected species is adequately understood.
- D: The nature and extent of indirect effects of commercial fishing are identified and described for protected species that are at particular risk to such effects.
- E: Adequate information on population level and susceptibility to fisheries effects for protected species populations identified as at medium or higher risk from fisheries.



Conservation Services Programme Annual Research Summary

Conservation Services Programme Annual Research Summary



Background

- Stakeholder desire for rationalized and timely reporting
- Better integration with CSP's new strategic direction

Aim

- A single and concise summary of the year's research and outputs
- Integrating the results of observer coverage with other CSP funded research
- Updates of the status of multiyear projects
- Ties back to each years annual plan
- Helps feed in to each years planning processes eg. CSP RAG

Conservation Services Programme Annual Research Summary

Structure

Observer summary

~4 page summary per fishery

- Overall and specific objectives
- Rationale
- Summary of methods and key findings including:
 - Commercial & observer effort
 - Protected species captures
 - Method of interaction
- Narrative of any patterns of trends observed, any anomalies or the cause of key bycatch events
- Consistent with previous observer reports
- Project logistics summary statement
- Citation
- Weblinks



Conservation Services Programme Annual Research Summary

Structure

Project summary

~2 page summary per project

- Overall and specific objectives
 - Rationale
 - Project status
 - Summary of methods and key findings
 - Recommendations
 - Project logistics summary statement (inc. review milestones)
 - Citation
 - Weblinks
-
- Additions/Improvements



2014-2015 CSP Annual Research Summary Projects

- **Interaction projects**

- Observing commercial fisheries

Objectives:

1. To identify, describe and, where possible, quantify protected species interactions with commercial fisheries;
2. To identify, describe and, where possible, quantify measures for mitigating protected species interactions;
3. To collect information relevant to identifying levels of cryptic mortality of protected species resulting from interactions with commercial fisheries.
4. To collect other relevant information on protected species interactions that will assist in assessing, developing and improving mitigation measures

Status:

Ongoing



2014-2015 CSP Annual Research Summary Projects



- **Interaction projects**

- Identification of seabirds captured in New Zealand fisheries

Objectives:

1. To determine, through examination of returned seabird specimens, the taxon, sex, and where possible age-class and provenance of seabirds killed in New Zealand fisheries (for returned dead specimens).
2. To detail the injuries, body condition and stomach contents and, where possible, the likely cause of mortality (for returned dead specimens).
3. To report any changes in the protocol used for the necropsy of seabirds (for returned dead specimens).
4. To determine, through examination of photographs, the taxon and, where possible, sex, age-class and provenance of seabirds captured in New Zealand fisheries (for live captures or dead specimens discarded at sea).

Status:

Completion date June 2016

2014-2015 CSP Annual Research Summary Projects

- Interaction projects

- Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries

Objectives:

1. To determine, primarily through examination of photographs, the taxon and, where possible, sex, age-class and provenance of marine mammals, turtles and protected fish captured in New Zealand fisheries (for live captures and dead specimens discarded at sea).

Status:

In progress.



2014-2015 CSP Annual Research Summary Projects

- Population projects

- New Zealand sea lion population project (Auckland Islands)

Objectives:

1. To estimate New Zealand sea lion pup production at Enderby, Figure of 8 and Dundas Islands.
2. To mark New Zealand sea lion pups at Enderby and Dundas Islands following established techniques.
3. To conduct a three to five week period of resighting previously marked animals at Enderby Island.
4. To update the New Zealand sea lion database.

Status:

Completed



2014-2015 CSP Annual Research Summary Projects



- Population projects

- Seabird population research 2014-15

Species

Objective

Black petrel

A - Population size (Aotea/Great Barrier Island and Hauturu/Little Barrier Island)

B - Key demographic parameters, primarily juvenile and adult survival (Aotea/Great Barrier Island)

Salvin's albatross

A - Population estimate (The Snares)

B - Adult survival and other demographic parameters (The Snares)

White-capped albatross

A - Population estimate (Auckland Islands)

B - Ground truth aerial survey methods on Disappointment Island, Auckland Islands

C - Investigate logistics of establishing a mark-recapture study to investigate adult survival and other demographic parameters (Disappointment Island, Auckland Islands)

Southern Buller's Albatross

A - Population estimate (Solander Islands)

B - Adult survival and other demographic parameters (The Snares)

2014-2015 CSP Annual Research Summary Projects



- Population projects

- Seabird population research 2014-15 (cont)

Species

Objective

Gibson's albatross

A - Population estimate (Auckland Islands)

B - Adult survival and other demographic parameters (Adams Island, Auckland Islands)

White-chinned
petrel

A - Investigate logistics of establishing a mark-recapture study to investigate adult survival and other demographic parameters (Auckland Islands)

B - Investigate a methodology to estimate the population size on Adams Island, Auckland Islands

C - Spatial foraging information (Auckland Islands)

D - Taxonomic status across New Zealand populations

Burrowing petrels

Review survey methods to describe areas of uncertainty in relation to estimating population sizes

Status:

Completed

2014-2015 CSP Annual Research Summary Projects

- Population projects
 - Protected fish population research

Overall objective:

To progress research on key information gaps in protected fish population
Information

Status:

In Progress.



2014-2015 CSP Annual Research Summary Projects

- Mitigation projects
 - Protected species bycatch newsletter

Overall Objective:

To produce a newsletter to communicate protected species-related information to trawl and longline fishermen.

Status:

Completed.



2014-2015 CSP Annual Research Summary Projects

- Mitigation projects
 - Improvement of tori line performance in small vessel longline fisheries

Overall Objective:

To develop improved tori lines which are specifically optimised for safe and effective use in small longline vessels.

Status:

Due for completion May 2016.



2014-2015 CSP Annual Research Summary Projects

- Mitigation projects
 - Seabird liaison officers

Overall Objective:

To provide one or more liaison officers to the inshore fishing fleet who will be tasked to assist those fleets in reducing their risk to seabirds.

Status:

Completed.





Recommendations from Conservation Services Programme Research Reports



Protected fish (2011-12)

- Increase the availability for research of specimens of protected fish species by:
 - making it legal for fishers to land dead specimens;
 - encouraging and educating fishers about the value of specimens for research; and
 - providing the specimens to a research organisation
- Genetic analyses and electronic tagging
- More detailed information collected on manta and devil ray encounters
- Observations of devils rays and other protected sharks by spotter planes
 - Information on spatial & temporal patterns of occurrence
- Development of methods for improved live release of captured sharks and rays



Seabirds

- Yellow-eyed penguin (2011-12)
 - Increase observer coverage
 - To improve the quality of risk assessment
 - Comprehensive analysis of foraging ecology & at sea distribution (& seafloor surveys)
 - To assess the impact of benthic habitat degradation



Seabirds

- Pitt Island Shags (2012-13)
 - Further studies on the foraging ecology at other breeding areas
 - To determine differences in foraging behaviour & efficiency
 - 3-5 year study investigating breeding parameters (i.e. breeding success)



Seabirds

- **Black petrel 2013-14 & 2014-15**
 - Population monitoring to be continued up to 2024/25 breeding season
 - To allow development of a multi-generational population model
 - Study burrows checked for breeding pairs every year
 - More accurate determination of breeding success & sex of adults
 - That 30 breeding adults carry TDR and GPS devices to obtain foraging information in NZ waters, and geolight loggers to obtain information on migration to South America
 - That further random transects are undertaken every five years throughout the 35-ha study area around Mount Hobson to increase the likelihood of adult and juvenile recaptures (to improve survival and immigration estimates) and to compare with earlier transect surveys to determine population trends
 - The exact limits of the Hauturu-o-Toi/Little Barrier Island black petrel colony or habitat should be established and the area calculated by a ground truth survey
 - Future analysis of the resighting data is completed



Seabirds

- **White-chinned petrel (2014-15)**

Population work in the Auckland Islands

- Disappointment Island is a key breeding site for white-chinned petrels globally, with burrow density an order of magnitude higher than most island-wide estimates and very high burrow occupancy. It is therefore an important site to revisit in order to monitor population trends.
- This estimate was influenced to an unknown extent by breeding failures prior to survey, which took place in mid-incubation. This timing bias should be addressed in future burrowing petrel surveys by timing surveys to take place just after egg-laying has finished.
- Adams Island is the only Auckland Islands site where white-chinned petrels are known to be numerous. An estimate of the population size there is required to complete an overall Auckland Islands population estimate.



Seabirds

- **Salvin's albatross (2014-15)**

Population estimate from the Snares

- If population size (annual breeding pairs) is to be regularly estimated using aerial photography, it would appear more appropriate to use the correction factor derived by the 2014 ground count to adjust raw counts each year, noting that this correction factor will likely be dependent on the time of the breeding season that the count is undertaken.
- Further ground-truthing undertaken concurrently with aerial photography would be of use to refine the correction factor. Alternatively, aerial photography could be used to simply assess the number of birds ashore and use this as an index of abundance to assess population trend over time



Seabirds

- **White-capped albatross (2014-15)**

Aerial photographic census

- Further annual photographic counts are recommended until population trends can be estimated with certainty.

Simulation modelling of mark recapture size effects on demographic rate estimation

- Data simulation approach indicates that resighting effort over 5-10 years would be required subsequent to banding of a population between 150-600 individuals.
- A greater sampling effort (in terms of banded individuals, number of resighting years or even resighting effort) may be required to obtain the same level of precision for a given sampling regime.



Seabirds

- **Southern Buller's albatross (2014-15)**
Updated population estimate for the Solander Islands
 - A continuation of at least annual checks of the three established study colonies to maintain information on population size and trend, adult survival and recruitment rate of known-age



Seabirds

- **Gibson's albatross (2014-15)**

Population estimate for the Auckland Islands

- Population size and trend and adult survival should continue to be estimated at regular intervals until the population substantially increases. A detailed modelling exercise such as the one carried out by Francis et al in 2012 would give a better indication of the trajectory of the whole population and should be undertaken within the next five years.
- None of the potential methods for making a new estimate of total population size would give a result which could be directly compared with estimates made in the 1990's, and all would include some degree of error. Given the quality of the existing estimate, a new whole island ground or aerial count is not considered warranted.



Corals (2011-12)

- Research to better understand the distribution of protected corals
 - Update and maintain the protected coral dataset
 - Increase observer coverage
 - Improve the quality of observer data
 - Improve identification of protected corals
- Research to better understand coral biology
 - Collect information on coral age, growth, size, & form
 - Improve current information gaps on cold water coral reproduction and connectivity
 - Review international literature with regard to biological parameters
 - Species associations
- Additional environmental data layer
 - For modeling the distribution of protected corals

Marine mammals

- **New Zealand sea lions**

2012-13

- Obtain robust estimates of tag loss
To properly estimate survival and obtain good fits to pup census observations
- Estimate the rate of breeding site relocations
- To improve pup census observations
- Determine if estimated demographic parameters reproduce a decline similar to that observed
- Determine how much would survival or pupping rates need to increase for the population size to stabilise





Marine mammals

- **New Zealand sea lions**

2014-15

- Understanding the causes of mortality to the decline in pup production is important and autopsies should be included into the existing project;
- Consideration should be given to prior approval for vets to use injectable humane euthanasia of moribund pups.
- Flipper tagging 50% pups at Sandy Bay should be reviewed.
- It would be useful to develop a standardised method for the estimation of confidence intervals for pup production
- Pup and adult body condition have been implicated in the decline of pup production at the Auckland Islands. It would be useful to assess how this information could be collected in future.
- Some sources of pup mortality could be mitigated through active management and should be explored further
- Surveys at other Auckland Island locations for NZSL

Marine mammals

- New Zealand sea lions

2014-15

Demographic modeling work (NIWA)

Addressing questions such as

1. Do the estimated demographic parameters reproduce a decline similar to that observed?
2. How much would survival or pupping rates need to increase for the population size to stabilise?

would help to explain the causes of declining pup production and would also give some indication of the magnitude of effect that has caused the decline. This knowledge would further inform the identification of potential conservation measures for countering population decline.





Marine mammals

- **New Zealand sea lions**

2014-15

Correlative assessment (NIWA)

Knowledge gaps: additional observations could be collected to further explore the mechanisms of demographic change (e.g., disease-related mortality rates of pups after 12 weeks and continuous collection of observations for monitoring maternal condition).

Given the short time series of observations available at the time of assessment, we recommend re-assessment of these relationships with a longer time series of observations once available.

Further exploration of the identified relationships should include a model-based assessment (as opposed to correlative), such that it will be possible to estimate effect sizes relating to drivers of demographic changes. This will be required to more adequately explain the ultimate causes of population decline.

Mitigation projects

- **Inshore longline**
work underway to develop tori line specifications
- **Liaison role**
expanded bycatch reduction project underway
- **Future directions pending completion of**
 - small vessel tori line development
 - bird baffler development
 - Kellian line setter development





Interaction projects

- Identification of seabirds, marine mammals, turtles and protected fish
- Autopsy work
 - ensuring adequate data collection and linking for any returned specimens
- Photo ID work
 - Interactions photographed and recorded with trip number and haul/sample information included in the image.
 - Images (with scale if possible) include the all diagnostic features including head and bill from the side and above, body (full body and side shots), wings (above and below) and shots of the feet.
 - Photo logs completed for all images (which can be correlated to camera date and time stamps) with descriptions to help with the identification and matching of images.

Conservation Services Programme 2015-16 Research Projects



- **Interaction projects**
 - Observing commercial fisheries
 - Identification of seabirds captured in New Zealand fisheries
 - Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries
 - Identification and storage of cold-water coral bycatch specimens
 - Black petrel and flesh-footed shearwater foraging behaviour around fishing vessels

Conservation Services Programme 2015-16 Research Projects



- **Population projects**

- Black petrel: Aotea/Great Barrier Island & Hauturu/Little Barrier Island population project
- Seabird population research 2014-15
- Flesh-footed shearwater: Various locations population project
- Seabird population research: Auckland Islands 2015-16
- Northern Buller's albatross: review taxonomy
- New Zealand Sea Lion: Auckland Islands Population Project
- Marine reptiles - review of interactions and populations
- Supporting genetic analysis of protected fish species

Conservation Services Programme 2015-16 Research Projects

- **Mitigation projects**
 - Protected species bycatch newsletter
 - Seabird bycatch reduction (small vessel longline fisheries)
 - Small vessel seabird mitigation project





Non CSP Developments

Interaction research

EM trials (SSST) / Trident - artificially seeded lines to assess detection rates of black petrel / fleshfooted shearwater proxies



Seabird Research

Work underway to collate spatial data and develop a database of metrics relevant to risk assessments for all NZ seabirds (DOC Marine Species & Threats)

Yellow-eyed penguin: breeding counts very low this season (DOC/YEPT)
stocktake review of recovery plan (Collaborative)

Antipodean albatross: update from Albatross Research (short report provided)

Chatham Island albatross: ongoing translocation (Chatham Islands Taiko Trust)

Westland petrel: updated population modelling by Waugh et al (2015): *Modeling the demography and population dynamics of a subtropical seabird, and the influence of environmental factors*

Northern royal albatross – ongoing management and monitoring at Taiaroa Head (DOC)

Chatham petrel – ongoing management at Rangatira and Sweetwater (DOC/Chatham Islands Taiko Trust)



Seabird Research (contd)

New Zealand storm petrel – ongoing monitoring at Little Barrier Island and at-sea (collaborative programme)

Pitt Island and Chatham Island shags: three year project initiated to investigate breeding biology and threats (WMIL – DOC and CCPF supported)

King shag: comprehensive aerial survey in 2015, and comparison of methodologies (OSNZ/DOC)



Protected fish Research

- Commercial Great White Shark Cage Diving Code of Practice 2013
- Key conditions for permits for commercial white shark cage diving.
- Potential risks to white sharks from cage diving are identified and minimised.
 - Risks to humans not addressed
- First permits issued in Dec 2014
 - include the Code Of Practice in conditions.
- Collaboration
 - Permissions
 - Services
 - Partnerships.
- Qualitative level 1 Risk Assessment for Chondrichyans in New Zealand Waters



Marine Mammal Research

- Development of the NZSL Threat Management Plan between DOC & MPI
- Development of the Māui dolphin Research Advisory Group
 - Māui dolphin five-year strategy and research plan produced
 - 2015/16 abundance estimate underway
- Collaboration with NIWA and Oregon State University on blue whale research
- Cook Strait whale survey
- Review of seismic surveying Code of Conduct
- Development of GIS-enabled marine mammal sightings database
- Project Jonah Service Level Agreement for stranding response
- SMART (Sustainable marine mammal actions in recreation and tourism)
 - Led by Partnerships
 - Technical support/delivery



Cold Water Coral Research

- Development of future coral distribution modelling projected, due for completion in December.
 - Building on previous coral modelling work (POP2013-05) which described the distribution of deep sea coral in relation to areas where they are at risk of interactions with commercial fishing gear.

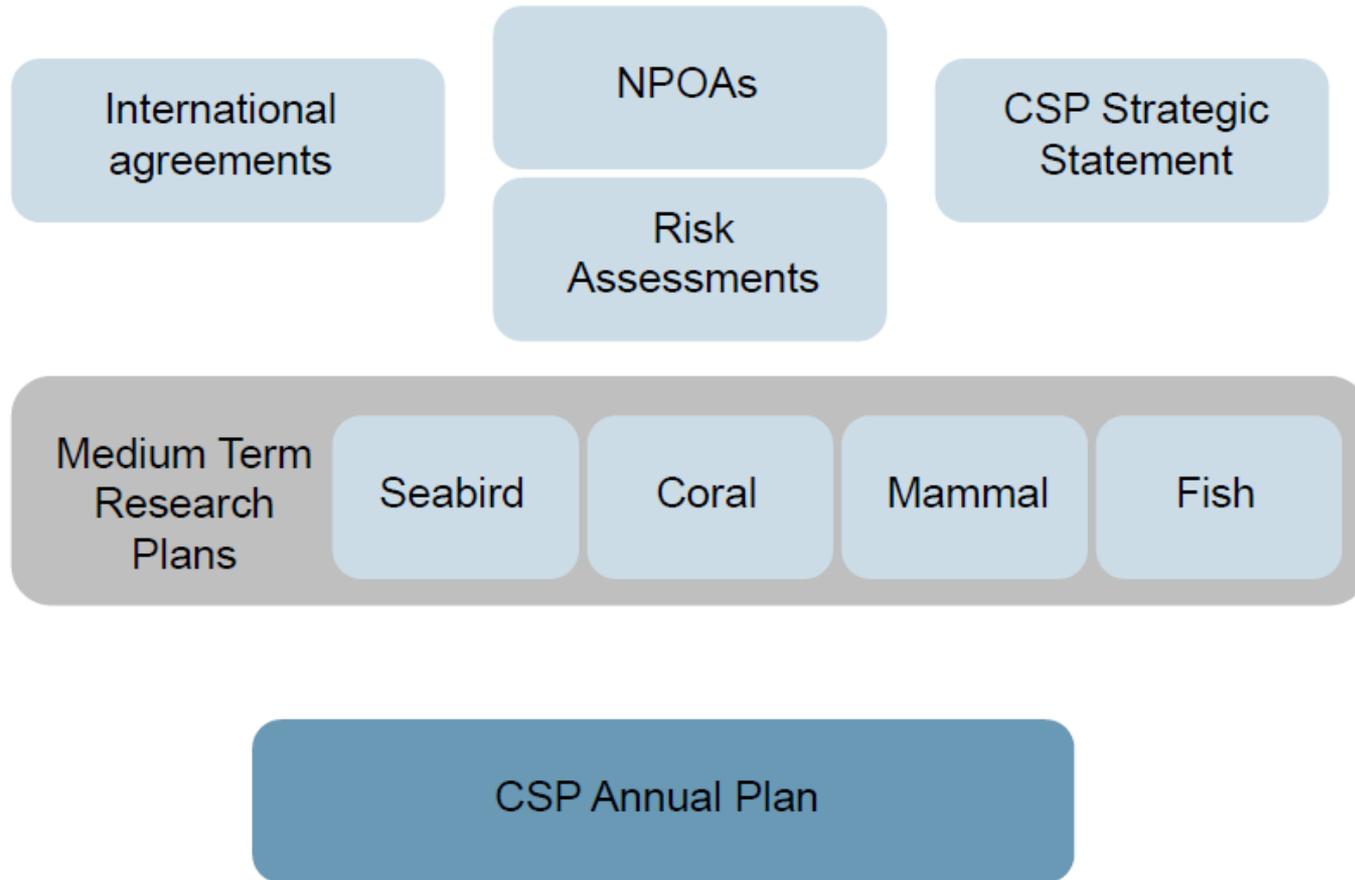


Mitigation research

Mini hookpod development (DOC/MPI/Birdlife/Hookpod Ltd)



Medium Term Research plans



Seabird 5 year plan



Common name	2015/16	2016/17
Black petrel	M-R study GBI Pop est GBI, LBI	Review M-R response
Salvin's albatross	Pop est & Track Bounty, Review M-R feasibility	
Southern Buller's albatross	M-R study Snares	M-R study Snares Pop est Snares
Flesh-footed shearwater	M-R study, track & pop est various	M-R study
Gibson's albatross	Pop est Auck Is M-R study Auck Is	M-R study Auck Is
New Zealand white-capped albatross	Pop est Auck Is, Review M-R feasibility	Review Pop est Auk Is
Chatham Island albatross		Pop est Chat
Antipodean albatross	M-R study*, track & pop est Antip	M-R study*
Westland petrel	M-R study	M-R study & pop est mainland
Northern Buller's albatross	Review taxonomy	Pop est & Invest M-R study Chatham
Campbell black-browed albatross		
Stewart Island shag		
White-chinned petrel	Pop est & track Auck Is, Review M-R feasibility, Review taxonomy	
Yellow-eyed penguin (mainland)		Review taxonomy Pop est mainland
Northern giant petrel	Investigate M-R study Pop est Auck Is	Pop est Chat
Spotted shag		Pop est review year 1 Review taxonomy
Northern royal albatross		Pop est Chat
Chatham petrel		Pop est Chat
Snares Cape petrel		Pop est Snares Investigate M-R study
Grey petrel	Investigate M-R study	
Light-mantled sooty albatross		
Fiordland crested penguin		
New Zealand king shag	Review tracking feasibility	Pop est mainland
New Zealand storm petrel	Population est LBI	
Pitt Island shag		Pop est & track Chat
Chatham Island shag		Pop est & track Chat

Fish 5 year plan



Species	Research	Year				
		1	2	3	4	5
Basking shark	L1RA					
	L2RA					
	MIT					
	SURV					
	LIVE					
	TRACK					
	BIO GEN					
Deepwater nurse shark	L1RA					
	L2RA					
	MIT					
	SURV					
	LIVE					
	TRACK					
	BIO GEN					
Oceanic whitetip shark	L1RA					
	L2RA					
	MIT					
	SURV					
	LIVE					
	TRACK					
	BIO GEN					
Whale shark	L1RA					
	L2RA					
	MIT					
	SURV					
	LIVE					
	TRACK					
	BIO GEN					
White pointer shark	L1RA					
	L2RA					
	MIT					
	SURV					
	LIVE					
	TRACK					
	BIO GEN					
Manta ray	L1RA					
	L2RA					
	MIT					
	SURV					
	LIVE					
	TRACK					
	BIO GEN					
Spinetail devil ray	L1RA					
	L2RA					
	MIT					
	SURV					
	LIVE					
	TRACK					
	BIO GEN					
Giant grouper	L1RA					
	L2RA					
	MIT					
	SURV					
	LIVE					
	TRACK					
	BIO GEN					
Spotted black grouper	L1RA					
	L2RA					
	MIT					
	SURV					
	LIVE					
	TRACK					
	BIO GEN					