



NEW ZEALAND THREAT CLASSIFICATION SERIES 23

# Conservation status of New Zealand chondrichthyans (chimaeras, sharks and rays), 2016

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Department of  
Conservation  
*Te Papa Atawhai*

Cover: *Mobula mobular* mating train, northeast of Poor Knights Islands, New Zealand, 4 March 2017. Photo: Scott Tindale.

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# Conservation status of New Zealand chondrichthyans (chimaeras, sharks and rays), 2016

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## Abstract

The conservation status of all known New Zealand chondrichthyan taxa (chimaeras, sharks and rays) was reassessed using the New Zealand Threat Classification System (NZTCS). Since the last assessment (in 2005), 9 new taxa have been added to the list, 6 have been removed from it and 30 have had name changes. Also, 1 previously Data Deficient taxon is now assessed as Not Threatened while 14 taxa that had previously been assessed are now considered to be Data Deficient. The conservation status of 6 other taxa has changed in this assessment: 2 that were previously assessed as At Risk - Declining are now Nationally Endangered and Nationally Vulnerable respectively; 4 that were At Risk - Naturally Uncommon are now Not Threatened. A full list is presented, along with a statistical summary and brief notes on the most important changes. This list replaces all previous NZTCS lists for chondrichthyans.

Keywords: New Zealand Threat Classification System, NZTCS, conservation status, requiem sharks, chimaeras, lanternsharks, catsharks, hardnose skates, sleeper sharks, spiny dogfishes, Carcharhinidae, Chimaeridae, Etmopteridae, Pentanchidae, Rajidae, Somniosidae, Squalidae

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# 1. Summary

The conservation status of 113 New Zealand chondrichthyan taxa was assessed using New Zealand Threat Classification System (NZTCS) criteria (Townsend et al. 2008). This replaces the 2005 assessment of chondrichthyan taxa (Hitchmough et al. 2007; see also [www.nztc.org.nz/#/reports/65](http://www.nztc.org.nz/#/reports/65)).

The categories, criteria and process for assessing the conservation status of chondrichthyans changed between the two listings. The 2005 assessment used the criteria of Molloy et al. (2002). The main difference between the Townsend et al. (2008) and Molloy et al. (2002) versions of the NZTCS that affected this report is that the categories 'At Risk - Sparse' and 'At Risk - Range Restricted' of Molloy et al. (2002) are equivalent to the single category 'At Risk - Naturally Uncommon' of Townsend et al. (2008). A detailed explanation of these changes can be found in Townsend et al. (2008).

The expert panel for this assessment was Clinton Duffy, Malcolm Francis, Matthew Dunn, Brit Finucci, Richard Ford, Rod Hitchmough and Jeremy Rolfe. The conservation status categories and criteria are summarised in the following section and detailed in Townsend et al. (2008). The expert panel drew upon their knowledge of the species, the scientific literature, stock assessments, information on trends in reported and observed commercial catch, research trawl findings and information contained in the qualitative risk assessment for New Zealand chondrichthyans undertaken by Ford et al. (2015). As only one published estimate of the size (i.e. number of mature individuals) of any New Zealand chondrichthyan population was available, the significance of reported trends in relative abundance of most species was assessed against estimated overlap with fisheries and reported catch. The latter served as a proxy for a species' availability to the fishery. Species only known from a limited number of specimens, or for which no population trend information was available were generally assessed as Data Deficient. The exceptions to this were those species known to be abundant and therefore inferred to have a large population size, or where most of the population was considered to be unavailable to fisheries either due to small body size, or their presence in a spatial refuge from fishing. International research on regional and global population structure and size informed the great white shark (*Carcharodon carcharias*) and basking shark (*Cetorhinus maximus*) assessments (Hoelzel et al. 2006; Blower et al. 2012; Bruce et al. 2018; Hillary et al. 2018).

Hitchmough et al. (2007) reported on 51 chondrichthyan taxa that had been assessed in 2005. An additional 59 chondrichthyan taxa were assessed as Not Threatened in 2005 but they were not reported on in Hitchmough et al. (2007). The complete list of 110 chondrichthyan taxa that were assessed in 2005 can be found at <http://www.nztc.org.nz/#/reports/65>. Since then nine taxa have been added (Table 1), and six have been removed from the fauna (Table 2) (Last & McEachran, 2006; Duffy & Last 2007a; Straube et al. 2011; Last & Séret, 2012; Roberts et al. 2015; Duffy 2016; Last et al. 2016; Duffy et al. 2017). Thirty of the taxa assessed in 2005 (<http://www.nztc.org.nz/#/reports/65>) have had name changes (Table 3) (Roberts et al. 2015; White et al. 2017).

Table 1. Taxa added since Hitchmough et al. (2007).

NAME AND AUTHORITY	REASON FOR INCLUSION	FAMILY	COMMON NAME
<i>Bathyraja pacifica</i> Last, Stewart & Séret, 2016	Newly recognised taxon	Arhynchobatidae	Pacific blonde skate
<i>Brochiraja vittacauda</i> Last & Séret, 2012	Newly recognised taxon	Arhynchobatidae	ribbontail skate
<i>Carcharhinus plumbeus</i> (Nardo, 1827)	Newly reported in New Zealand waters	Carcharhinidae	sandbar shark
<i>Cephaloscyllium</i> sp. 2 cf. <i>variegatum</i> Last & White, 2008	Newly recognised taxon	Scyliorhinidae	banded carpetshark
<i>Deania hystricosa</i> (Garman, 1906)	Previously omitted due to doubts about its taxonomic distinctiveness	Centrophoridae	rough shovelnose dogfish

Continued on next page

Table 1 continued

NAME AND AUTHORITY	REASON FOR INCLUSION	FAMILY	COMMON NAME
<i>Etmopterus viator</i> Straube, 2011	Newly recognised taxon	Etmopteridae	slate lanternshark, blue-eyed lanternshark
<i>Notoraja sapphira</i> Séret & Last, 2009	Newly recognised taxon	Arhynchobatidae	sapphire skate
<i>Tetronarce</i> sp. 1 cf. <i>tokionis</i> (Tanaka, 1908)	Newly reported in NZ waters	Torpedinidae	slender electric ray
<i>Triaenodon obesus</i> (Rüppell, 1837)	Newly reported in NZ waters	Carcharhinidae	whitetip reef shark

Table 2. Taxa listed in Hitchmough et al. (2007) that have been removed from this report.

NAME AND AUTHORITY	REASON FOR REJECTION	FAMILY	COMMON NAME
<i>Carcharhinus amblyrhynchos</i> (Bleeker, 1856)	Misidentification	Carcharhinidae	grey reef shark
<i>Carcharhinus falciformis</i> (Bibron, 1839)	Unreliable record	Carcharhinidae	silky shark
<i>Proscymnodon plunketi</i> Waite, 1910	Taxonomically indistinct, junior synonym of <i>Centroscymnus macracanthus</i> Regan, 1906	Somniosidae	Plunket's shark/largespine velvet dogfish
<i>Squalus</i> sp. 2	Does not occur within the EEZ. Restricted to Lord Howe Island.	Squalidae	longnose spiny dogfish
<i>Squalus</i> sp. 3	Taxonomically indistinct, conspecific with <i>Squalus griffini</i> Phillipps, 1931	Squalidae	paddletail spiny dogfish
<i>Squalus</i> cf. <i>mitsukurii</i> Jordan & Snyder, 1903	Taxonomically indistinct, conspecific with <i>Squalus</i> sp. 5	Squalidae	greeneye spiny dogfish

Taxonomic revision of two poorly known deepwater groups, softnose skates (Arhynchobatidae) and deep-water catsharks (*Apristurus* spp.), has resulted in clarification of the status of 11 species listed as taxonomically indeterminate in 2005. Last & McEachran (2006) erected the endemic genus *Brochiraja* for seven species of deep water softnose skate previously assigned to the genus *Notoraja*, and formally described five of these as new species (Table 3). Review of Australasian *Apristurus* has clarified the taxonomic status and distributions of most of the taxa occurring in New Zealand waters, although further research is required to resolve species boundaries in the *A. sinensis* complex (Kawauchi et al. 2008; Nakaya et al. 2008; Sasahara et al. 2008; Sato et al. 2013; Roberts et al. 2015). Taxonomic revision of Australasian spiny dogfishes also resulted in the resurrection of the name *Squalus griffini* for the northern spiny dogfish (Duffy & Last 2007b). This species had been synonymised with *S. blainville* from the Mediterranean and eastern Atlantic, and most recently *S. mitsukurii* from the northwest Pacific (Duffy & Last 2007b). *Squalus griffini* occurs north of the subtropical convergence around New Zealand, including Chatham Islands, and along the oceanic ridges north of New Zealand to at least Norfolk Island and Raoul Island, and on Louisville Ridge (Roberts et al. 2015). The placement of the giant manta, formerly *Manta birostris*, in the genus *Mobula* and the synonymy of *Mobula japonica* with *M. mobular* follows White et al. (2017). Although both decisions are based on genetic analyses covering all species in the family Mobulidae, morphology does not support synonymy of *Manta* with *Mobula* (Last et al. 2016). Bustamante et al. (2016) has also presented genetic evidence that suggests *M. mobular* and *M. japonica* are distinct species. Definitive resolution of the status of these species requires further morphological and genetic comparisons using larger sample sizes, particularly for *M. mobular*.

Table 3. Name changes affecting New Zealand chondrichthyans since publication of Hitchmough et al. (2007).

NAME AND AUTHORITY IN HITCHMOUGH ET AL. (2007)	NAME AND AUTHORITY IN THIS DOCUMENT	FAMILY	COMMON NAME
<i>Amblyraja</i> cf. <i>hyperborea</i>	<i>Amblyraja hyperborea</i> (Collett, 1879)	Rajidae	Arctic skate/thorny skate
<i>Apristurus</i> sp. A	<i>Apristurus</i> cf. <i>sinensis</i> Chu & Hu, 1981	Pentanchidae	freckled catshark
<i>Apristurus</i> sp. B	<i>Apristurus albisoma</i> Nakaya & Séret, 1999	Pentanchidae	grey roundfin catshark
<i>Apristurus</i> sp. E	<i>Apristurus ampliceps</i> Sasahara, Sato & Nakaya, 2008	Pentanchidae	roughskin catshark/roundfin catshark

Continued on next page

Table 3 continued

NAME AND AUTHORITY IN HITCHMOUGH ET AL. (2007)	NAME AND AUTHORITY IN THIS DOCUMENT	FAMILY	COMMON NAME
<i>Apristurus</i> sp. G	<i>Apristurus garricki</i> Sato, Stewart & Nakaya, 2013	Pentanchidae	Pinocchio catshark/Garrick's catshark
<i>Apristurus</i> sp. C	<i>Apristurus melanoasper</i> Iglésias, Nakaya & Stehmann, 2004	Pentanchidae	fleshynose catshark
<i>Apristurus</i> sp. F	<i>Apristurus pinguis</i> Deng, Xiong & Zhan, 1983	Pentanchidae	deepwater/bulldog catshark
<i>Centroscyllium</i> ? <i>kamoharai</i>	<i>Centroscyllium kamoharai</i> Abe, 1966	Etmopteridae	fragile dogfish
<i>Cephaloscyllium</i> sp. B sensu Last & Stevens 1994	<i>Cephaloscyllium</i> sp. 1 cf. <i>variegatum</i> Last & White, 2008	Scyliorhinidae	swell shark/banded carpetshark
<i>Chimaera</i> sp. ?C (brown chimaera)	<i>Chimaera carophila</i> Kemper, Ebert, Naylor & Dider, 2014	Chimaeridae	brown/longspine chimaera
<i>Cirrhigaleus barbifer</i>	<i>Cirrhigaleus australis</i> White, Last & Stevens, 2007	Squalidae	southern mandarin dogfish
<i>Dipturus nasuta</i>	<i>Zearaja nasuta</i> (Banks in Müller & Henle, 1841)	Rajidae	rough skate
<i>Etmopterus baxteri</i> Garrick 1957	<i>Etmopterus granulosus</i> (Günther, 1880)	Etmopteridae	Baxter's dogfish/southern lantern shark
<i>Etmopterus</i> sp. B	<i>Etmopterus unicolor</i> (Engelhardt, 1912)	Etmopteridae	shortspine lantern shark
<i>Halaelurus dawsoni</i>	<i>Bythaelurus dawsoni</i> (Springer, 1971)	Pentanchidae	Dawson's cat shark
<i>Hydrolagus</i> sp. A	<i>Hydrolagus homonycteris</i> Didier, 2008	Chimaeridae	little black ghostshark
<i>Hydrolagus</i> sp. D	<i>Hydrolagus</i> sp. 1 cf. <i>affinis</i> (de Brito Capello, 1868)	Chimaeridae	giant black ghostshark
<i>Manta birostris</i>	<i>Mobula birostris</i> (Walbaum, 1792)	Mobulidae	giant manta ray
<i>Mobula japonica</i>	<i>Mobula mobular</i> (Bonnaterre, 1788)	Mobulida	spinetail devil ray
<i>Notoraja asperula</i> Garrick & Paul, 1974	<i>Brochiraja asperula</i> (Garrick & Paul, 1974)	Arhynchobatidae	smooth deepsea skate
<i>Notoraja spinifera</i> Garrick and Paul, 1974	<i>Brochiraja spinifera</i> (Garrick & Paul, 1974)	Arhynchobatidae	prickly deepsea skate
<i>Notoraja</i> sp. A	<i>Brochiraja albilabiata</i> Last & McEachran, 2006	Arhynchobatidae	whitemouth skate
<i>Notoraja</i> sp. B	<i>Brochiraja heuresa</i> Last & Séret, 2012	Arhynchobatidae	eureka skate
<i>Notoraja</i> sp. C	<i>Brochiraja leveneta</i> Last & McEachran, 2006	Arhynchobatidae	blue skate
<i>Notoraja</i> sp. D	<i>Brochiraja microspinifera</i> Last & McEachran, 2006	Arhynchobatidae	deepsea skate
<i>Notoraja</i> sp. E	<i>Notoraja alisae</i> Séret & Last, 2012	Arhynchobatidae	velcro skate
<i>Somniosus rostratus</i>	<i>Somniosus longus</i> (Tanaka, 1912)	Somniosidae	little sleeper shark
<i>Squalus</i> sp. 1	<i>Squalus griffini</i> Phillipps, 1931	Squalidae	northern/grey spiny dogfish
<i>Squalus</i> sp. 4	<i>Squalus raoulensis</i> Duffy & Last, 2007	Squalidae	Kermadec spiny dogfish
<i>Torpedo fairchildi</i>	<i>Tetronarce fairchildi</i> (Hutton, 1872)	Torpedinidae	electric ray

Nine taxa are listed as 'taxonomically indeterminate' to reflect that they do not have validly published names. Two of these are new to this report (*Cephaloscyllium* sp. 2 cf. *variegatum* and *Tetronarce* sp. 1 cf. *tokionis*). The inclusion of *Cephaloscyllium* sp. 2 cf. *variegatum* reflects differences in colour pattern noted between specimens collected from Star of Bengal Bank and West Norfolk Ridge (*Cephaloscyllium* sp. 1 cf. *variegatum*) (Roberts et al. 2015). *Tetronarce* sp. 1 cf. *tokionis* is known from seven specimens and belongs to a long-tailed group of electric rays requiring further taxonomic research (Roberts et al. 2015). All but one of the 'taxonomically indeterminate' taxa are Data Deficient. The Kermadec smooth-hound (*Mustelus* sp. 1) is assessed as Not Threatened because most of the population is thought to occur within the Kermadec Islands Marine Reserve, and the entire population is likely to occur within the Kermadec Benthic Protection Area. The latter prohibits the use of mobile fishing gears within 100 m of the sea floor (Fisheries (Benthic Protection Areas) Regulations 2007).



Table 4 compares the number of taxa in each category in the Chondrichthyans 2005 report (<http://www.nzctcs.org.nz/#/reports/65>; Hitchmough et al. 2007) with the number in this report. Table 5 summarises the movement of taxa between categories.

Table 4. Summary of the status of New Zealand chondrichthyan species assessed in 2005 (Hitchmough et al. 2007) and 2016 (this document).

CONSERVATION STATUS	2005	2016
Data Deficient	25	42
Nationally Endangered	—	1
Nationally Vulnerable	—	1
Gradual Decline <sup>1</sup>	2	—
Naturally Uncommon <sup>1</sup>	—	8
Range Restricted <sup>1</sup>	2	—
Sparse <sup>1</sup>	13	—
Not Threatened	60	55
Migrant	6	4
Vagrant	2	2
<b>Total</b>	<b>110</b>	<b>113</b>

<sup>1</sup> The categories 'Gradual Decline', 'Range Restricted' and 'Sparse' were used in the previous version of the NZTCS (Molloy et al. 2002). The nearest equivalent current categories are 'Declining' for 'Gradual Decline' and 'Naturally Uncommon' for 'Range Restricted' and 'Sparse', although no taxa have been assessed as 'Declining' in this report.

Table 5. Summary of status changes of New Zealand chondrichthyans between 2005 (data in rows; Hitchmough et al. 2007) and 2016 (data in columns; this document). Numbers shaded mid-grey above the diagonal show improved status (e.g. 4 of 15 Naturally Uncommon taxa have been reassessed as Not Threatened); numbers shaded light-grey below the diagonal indicate poorer status (one Gradual Decline taxon have been reassessed as Nationally Vulnerable and one as Nationally Endangered); numbers on the diagonal (shaded dark grey) have not changed; numbers without shading either were not listed previously or are not listed now.

		Conservation status 2016										
		Total	DD	NE	NV	Dec	NU	NT	Mig	Vag	NA <sup>2</sup>	TI <sup>3</sup>
		119	42	1	1	0	8	55	4	2	3	3
Conservation status 2005	Data Deficient (DD)	25	21					1			1	2
	Threatened – Nationally Endangered (NE)	0										
	Threatened – Nationally Vulnerable (NV)	0										
	At Risk – Gradual Decline (Dec)	2		1	1							
	At Risk – Naturally Uncommon <sup>1</sup> (NU)	15	3				8	4				
	Not Threatened (NT)	60	10					49				1
	Migrant (Mig)	6	1						4		1	
	Vagrant (Vag)	2								1	1	
	Not listed	9	7					1		1		

<sup>1</sup> The categories 'Range Restricted' (2 taxa) and 'Sparse' (13 taxa) that were used in 2005 are combined here as 'Naturally Uncommon' to enable comparison with this report.

<sup>2</sup> Not Assessed: taxa that are not assessed in this report because they had been previously misidentified in New Zealand waters.

<sup>3</sup> Taxonomically indistinct: now thought to be conspecific with other taxa in this report.

Four taxa reported in Hitchmough et al. (2007) have an improved conservation status of Not Threatened. The reassessment of the Galapagos shark (*Carcharhinus galapagensis*) and Kermadec smooth-hound (*Mustelus* sp. 1) as Not Threatened (formerly At Risk – Range Restricted) recognises that most of the known distributions of these species are protected within the Kermadec Islands Marine Reserve. This decision also reflects a change in the definition of

'Range restricted' for marine species between the manuals of Molloy et al. (2002) and Townsend et al. (2008). The sixgill shark (*Hexanchus griseus*) and Pacific sleeper shark (*Somniosus antarcticus*), both formerly assessed as At Risk - Sparse, were moved to Not Threatened because they are widespread deep-water species with small reported catches, suggesting distributions having limited overlap with fishing activities (Ford et al. 2015).

Two taxa reported in Hitchmough et al. (2007) as Data Deficient were also reassessed as Not Threatened. Richardson's skate (*Bathyraja richardsoni*) is a widespread species, now recognised to generally occur below fishing depths (Roberts et al. 2015). The largespine velvet dogfish (*Centroscymnus macracanthus*) was previously considered distinct from the Not Threatened Plunket's shark (*Proscymnodon plunketi*) but these are now thought to be the same species, with the name *Proscymnodon plunketi* treated as a junior synonym (Table 2).

The conservation status of two taxa has worsened. New information on population structure and estimated adult population size resulted in great white shark (*Carcharodon carcharias*) being assessed as Nationally Endangered (Blower et al. 2012; Duffy et al. 2012; Bruce et al. 2018; Hillary et al. 2018). Adult abundance is estimated to be between 590 and 750 individuals, with a total population size including juveniles of 5460 (2909–12802) (Bruce et al. 2018). The adult population trend is estimated to have slightly declined or remained stable since the early-mid 2000s (Bruce et al. 2018). This species had previously been assessed as Gradual Decline based upon its low biological productivity and reported levels of bycatch in commercial and recreational fisheries (Hitchmough et al. 2007). The basking shark (*Cetorhinus maximus*) has also moved to Nationally Vulnerable from Gradual Decline based on published assessments of catch and effort data and an absence of reports of surface aggregations in coastal hot spots since the mid-late 1990s (Francis & Duffy 2002; Hoelzel et al. 2006; Skomal et al. 2009; Francis & Smith 2010; Francis & Lyon 2012).

Thirteen taxa were reassessed as Data Deficient, 10 from Not Threatened, and three from Sparse, reflecting uncertainty about their status. They are: grey roundfin catshark (*Apristurus albisoma*), roughskin catshark / roundfin catshark (*Apristurus ampliceps*), pale / New Zealand catshark (*Apristurus exsanguis*), fleshynose catshark (*Apristurus melanoasper*), deepwater / bulldog catshark (*Apristurus pinguis*), freckled catshark (*Apristurus* cf. *sinensis*), Moller's lantern shark (*Etmopterus molleri*), whitetail dogfish (*Scymnodalatias albicauda*), Sherwood's dogfish (*Scymnodalatias sherwoodi*), velvet dogfish (*Zameus squamulosus*), electric ray (*Tetronarce fairchildi*), longtail skate (*Arhynchobatis asperrimus*) and spinetail devil ray (*Mobula mobular*). This reflects overlap between these species' known distributions and fisheries, and a lack of long-term fisheries data for them (Ford et al. 2015). The lack of fisheries or trawl survey data is often the result of difficult species identification, and in some cases low natural abundance, or low catchability due to size or behaviour. Recently published observations of spinetail devil rays from Northland confirm the species breeds in New Zealand waters (Duffy & Tindale 2018).

## 2. Conservation status of all known New Zealand chondrichthyans

Taxa are assessed according to the criteria of Townsend et al. (2008). They are listed in Table 6, which is arranged alphabetically by scientific name, with taxonomically indeterminate taxa listed in a separate section at the bottom of the table.

The conservation status categories, criteria and qualifiers are summarised below. See Townsend et al. (2008) for detailed descriptions of them:

### Data Deficient

Taxa that are suspected to be threatened, or in some instances, possibly extinct but are not definitely known to belong to any particular category due to a lack of current information about their distribution and abundance. It is hoped that listing such taxa will stimulate research to find out the true category (for a fuller definition see Townsend et al. 2008).

### Nationally Endangered

Criteria for Nationally Endangered:

#### *A – small population (natural or unnatural) that has a low to high ongoing or predicted decline*

A(1/1) 250–1000 mature individuals, predicted decline 10–50%

A(2/1) ≤5 subpopulations, ≤300 mature individuals in the largest subpopulation, predicted decline 10–50%

A(3/1) Total area of occupancy ≤10 ha (0.1 km<sup>2</sup>), predicted decline 10–50%

#### *B – small stable population (unnatural)*

B(1/1) 250–1000 mature individuals, stable population

B(2/1) ≤5 subpopulations, ≤300 mature individuals in the largest subpopulation, stable population

B(3/1) Total area of occupancy ≤10 ha (0.1 km<sup>2</sup>), stable population

#### *C – moderate population and high ongoing or predicted decline*

C(1/1) 1000–5000 mature individuals, predicted decline 50–70%

C(2/1) ≤15 subpopulations, ≤500 mature individuals in the largest subpopulation, predicted decline 50–70%

C(3/1) Total area of occupancy ≤100 ha (1 km<sup>2</sup>), predicted decline 50–70%

### Threatened – Nationally Vulnerable

Criteria for Nationally Vulnerable:

#### *A – small, increasing population (unnatural)*

A(1/1) 250–1000 mature individuals, predicted increase >10%

A(2/1) ≤5 subpopulations, ≤300 mature individuals in the largest subpopulation, predicted increase >10%

A(3/1) Total area of occupancy ≤10 ha (0.1 km<sup>2</sup>), predicted increase >10%

#### *B – moderate, stable population (unnatural)*

B(1/1) 1000–5000 mature individuals, stable population

B(2/1) ≤15 subpopulations, ≤500 mature individuals in the largest subpopulation, stable population

B(3/1) Total area of occupancy  $\leq 100$  ha ( $1 \text{ km}^2$ ), stable population

**C – moderate population, with population trend that is declining**

C(1/1) 1000–5000 mature individuals, predicted decline 10–50%

C(2/1)  $\leq 15$  subpopulations,  $\leq 500$  mature individuals in the largest subpopulation, predicted decline 10–50%

C(3/1) Total area of occupancy  $\leq 100$  ha ( $1 \text{ km}^2$ ), predicted decline 10–50%

**D – moderate to large population and moderate to high ongoing or predicted decline**

D(1/1) 5000–20 000 mature individuals, predicted decline 30–70%

D(2/1)  $\leq 15$  subpopulations,  $\leq 1000$  mature individuals in the largest subpopulation, predicted decline 30–70%

D(3/1) Total area of occupancy  $\leq 1000$  ha ( $10 \text{ km}^2$ ), predicted decline 30–70%

**E – large population and high ongoing or predicted decline**

E(1/1) 20 000–100 000 mature individuals, predicted decline 50–70%

E(2/1) Total area of occupancy  $\leq 10 000$  ha ( $100 \text{ km}^2$ ), predicted decline 50–70%

**At Risk – Naturally Uncommon**

Taxa whose distribution is confined to a specific geographical area or which occur within naturally small and widely scattered populations, where this distribution is not the result of human disturbance.

**Migrant**

Taxa that predictably and cyclically visit New Zealand as part of their normal life cycle (a minimum of 15 individuals known or presumed to visit per annum) but do not breed here.

**Vagrant**

Taxa whose occurrences, though natural, are sporadic and typically transitory, or migrants with fewer than 15 individuals visiting New Zealand per annum.

**Not Threatened**

Resident native taxa that have large, stable populations.

**Qualifiers**

- CD Conservation Dependent
- DP Data Poor
- Inc Increasing
- SO Secure Overseas
- S?O Uncertain whether Secure Overseas
- TO Threatened Overseas
- T?O Uncertain whether Threatened Overseas

Table 6. Conservation status of all known New Zealand chondrichthyans. This list replaces all previous assessments of New Zealand chondrichthyans.

SPECIES NAME	FAMILY NAME	COMMON NAME	CONSERVATION STATUS	CRITERIA	QUALIFIERS
<b>Taxonomically determinate</b>					
<i>Alopias superciliosus</i> (Lowe, 1841)	Alopiidae	bigeye thresher	Not Threatened		TO
<i>Alopias vulpinus</i> (Bonnaterre, 1788)	Alopiidae	thresher shark	Not Threatened		DP, TO
<i>Amblyraja hyperborea</i> (Collett, 1879)	Rajidae	Arctic skate/thorny skate	Not Threatened		
<i>Apristurus albisoma</i> Nakaya & Séret, 1999	Pentanchidae	grey roundfin catshark	Data Deficient		

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Conservation status of all known New Zealand chondrichthyans continued

SPECIES NAME	FAMILY NAME	COMMON NAME	CONSERVATION STATUS	CRITERIA	QUALIFIERS
<i>Apristurus ampliceps</i> Sasahara, Sato & Nakaya, 2008	Pentanchidae	roughskin catshark/ roundfin catshark	Data Deficient		
<i>Apristurus exsanguis</i> Sato, Nakaya & Stewart, 1999	Pentanchidae	pale/New Zealand catshark	Data Deficient		
<i>Apristurus garricki</i> Sato, Stewart & Nakaya, 2013	Pentanchidae	Pinocchio catshark/ Garrick's catshark	Data Deficient		
<i>Apristurus melanoasper</i> Iglésias, Nakaya & Stehmann, 2004	Pentanchidae	fleshnose catshark	Data Deficient		
<i>Apristurus pinguis</i> Deng, Xiong & Zhan, 1983	Pentanchidae	deepwater/bulldog catshark	Data Deficient		
<i>Arhynchobatis asperrimus</i> Waite, 1909	Arhynchobatidae	longtail skate	Data Deficient		
<i>Bathyraja pacifica</i> Last, Stewart & Séret	Arhynchobatidae	Pacific blonde skate	Not Threatened		DP
<i>Bathyraja richardsoni</i> (Garrick, 1961)	Arhynchobatidae	Richardson's skate	Not Threatened		DP
<i>Bathyraja shuntovi</i> Dolganov, 1985	Arhynchobatidae	longnose deepsea skate	Not Threatened		
<i>Brochiraja albilabiata</i> Last & McEachran, 2006	Arhynchobatidae	whitemouth skate	Data Deficient		
<i>Brochiraja asperula</i> (Garrick & Paul, 1974)	Arhynchobatidae	smooth deepsea skate	Data Deficient		
<i>Brochiraja heureka</i> Last & Séret, 2012	Arhynchobatidae	eureka skate	Data Deficient		
<i>Brochiraja leviveneta</i> Last & McEachran, 2006	Arhynchobatidae	blue skate	Data Deficient		
<i>Brochiraja microspinifera</i> Last & McEachran, 2006	Arhynchobatidae	deepsea skate	Data Deficient		
<i>Brochiraja spinifera</i> (Garrick & Paul, 1974)	Arhynchobatidae	prickly deepsea skate	Data Deficient		
<i>Brochiraja vittacauda</i> Last & Séret, 2012	Arhynchobatidae	ribbontail skate	Data Deficient		
<i>Bythaelurus dawsoni</i> (Springer, 1971)	Pentanchidae	Dawson's cat shark	Not Threatened		DP
<i>Callorhinchus milii</i> Bory de St Vincent, 1823	Callorhynchidae	elephantfish	Not Threatened		CD, Inc
<i>Carcharhinus brachyurus</i> (Gunther, 1870)	Carcharhinidae	bronze whaler	Not Threatened		CD, DP, SO
<i>Carcharhinus galapagensis</i> (Snodgrass & Heller, 1905)	Carcharhinidae	Galapagos shark	Not Threatened		CD, SO
<i>Carcharhinus longimanus</i> (Poey, 1861)	Carcharhinidae	oceanic whitetip shark	Migrant		SO
<i>Carcharhinus obscurus</i> (Lesueur, 1818)	Carcharhinidae	dusky shark	Migrant		SO
<i>Carcharhinus plumbeus</i> (Nardo, 1827)	Carcharhinidae	sandbar shark	Data Deficient		
<i>Carcharodon carcharias</i> (Linnaeus, 1758)	Lamnidae	great white shark/white pointer	Threatened – Nationally Endangered	B(1)	DP, TO
<i>Centrophorus harrisonii</i> McCulloch, 1915	Centrophoridae	Harrison's dogfish	Data Deficient		TO
<i>Centrophorus squamosus</i> (Bonnaterre, 1788)	Centrophoridae	leafscale gulper shark	Not Threatened		SO
<i>Centroscyllium kamoharui</i> Abe, 1966	Etmopteridae	fragile dogfish	Data Deficient		
<i>Centroscymnus coelolepis</i> Bocage & Capello, 1864	Somniosidae	Portuguese dogfish	Not Threatened		DP
<i>Centroscymnus crepidater</i> (Bocage & Capello, 1864)	Somniosidae	longnose velvet dogfish	Not Threatened		SO
<i>Centroscymnus macracanthus</i> Regan, 1906	Somniosidae	Plunket's shark	Not Threatened		T?O
<i>Centroscymnus owstoni</i> Garman, 1906	Somniosidae	Owston's dogfish	Not Threatened		
<i>Cephaloscyllium isabellum</i> (Bonnaterre, 1788)	Scyliorhinidae	carpet shark	Not Threatened		
<i>Cetorhinus maximus</i> (Gunnerus, 1765)	Cetorhinidae	basking shark	Threatened – Nationally Vulnerable	C(1)	
<i>Chimaera carophila</i> Kemper, Ebert, Naylor & Dider, 2014	Chimaeridae	brown/longspine chimaera	Not Threatened		
<i>Chimaera lignaria</i> Didier, 2002	Chimaeridae	giant purple chimaera	Not Threatened		
<i>Chimaera panthera</i> Didier, 1998	Chimaeridae	leopard chimaera	Not Threatened		DP
<i>Chlamydoselachus anguineus</i> Garman, 1884	Chlamydoselachidae	frill shark	At Risk – Naturally Uncommon		DP, SO

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SPECIES NAME	FAMILY NAME	COMMON NAME	CONSERVATION STATUS	CRITERIA	QUALIFIERS
<i>Cirrhigaleus australis</i> White, Last & Stevens, 2007	Squalidae	southern mandarin dogfish	At Risk – Naturally Uncommon		DP, TO
<i>Dalatias licha</i> (Bonnaterre, 1788)	Dalatiidae	seal/black shark	Not Threatened		SO
<i>Dasyatis breviceaudata</i> (Hutton, 1875)	Dasyatidae	shorttail stingray	Not Threatened		SO
<i>Dasyatis thetidis</i> Ogilby, 1899	Dasyatidae	longtail stingray	Not Threatened		SO
<i>Deania calcea</i> (Lowe, 1839)	Centrophoridae	shovelnose dogfish	Not Threatened		
<i>Deania hystricosa</i> (Garman, 1906)	Centrophoridae	rough shovelnose dogfish	Data Deficient		
<i>Deania quadrispinosa</i> (McCulloch, 1915)	Centrophoridae	longsnout dogfish	Data Deficient		SO
<i>Dipturus innominatus</i> (Garrick & Paul, 1974)	Rajidae	smooth skate	Not Threatened		CD
<i>Echinorhinus brucus</i> (Bonnaterre, 1788)	Echinorhinidae	bramble shark	At Risk – Naturally Uncommon		DP, SO
<i>Echinorhinus cookei</i> Pietschmann, 1928	Echinorhinidae	prickly shark	At Risk – Naturally Uncommon		DP, SO
<i>Etmopterus granulosus</i> (Günther, 1880)	Etmopteridae	Baxter's dogfish	Not Threatened		SO
<i>Etmopterus lucifer</i> Jordan & Snyder, 1902	Etmopteridae	Lucifer dogfish	Not Threatened		DP, SO
<i>Etmopterus mollerii</i> (Whitley, 1939)	Etmopteridae	Moller's lantern shark	Data Deficient		S?O
<i>Etmopterus pusillus</i> (Lowe, 1839)	Etmopteridae	smooth lantern shark	At Risk – Naturally Uncommon		DP, SO
<i>Etmopterus unicolor</i> (Engelhardt, 1912)	Etmopteridae	shortspine lantern shark	Not Threatened		SO
<i>Etmopterus viator</i> Straube, 2011	Etmopteridae	slate lanternshark, blue-eyed lanternshark	Data Deficient		
<i>Euprotomicrus bispinatus</i> (Quoy & Gaimard, 1824)	Dalatiidae	pygmy shark	Not Threatened		SO
<i>Galeocerdo cuvier</i> (Peron & Lesueur, 1822)	Carcharhinidae	tiger shark	Migrant		SO
<i>Galeorhinus galeus</i> (Linnaeus, 1758)	Triakidae	school shark, tope	Not Threatened		CD, TO
<i>Gollum attenuatus</i> (Garrick, 1954)	Proscylliidae	slender smoothhound	Not Threatened		SO
<i>Harriotta haeckeli</i> Karrer, 1972	Rhinochimaeridae	smallspine spookfish	Not Threatened		
<i>Harriotta raleighana</i> Goode & Bean, 1895	Rhinochimaeridae	longnose spookfish	Not Threatened		
<i>Heptranchias perlo</i> (Bonnaterre, 1788)	Heptranchiidae	sharpnose sevengill shark	At Risk – Naturally Uncommon		DP, SO
<i>Heterodontus portusjacksoni</i> (Meyer, 1793)	Heterodontidae	Port Jackson shark	Vagrant		SO
<i>Hexanchus griseus</i> (Bonnaterre, 1788)	Hexanchidae	sixgill shark	Not Threatened		DP, SO
<i>Hydrolagus bemisi</i> Didier, 2002	Chimaeridae	pale ghostshark	Not Threatened		CD
<i>Hydrolagus homonycteris</i> Didier, 2008	Chimaeridae	little black ghostshark	Not Threatened		SO
<i>Hydrolagus novaezelandiae</i> (Fowler, 1911)	Chimaeridae	dark ghost shark	Not Threatened		
<i>Hydrolagus trolli</i> Didier & Séret, 2002	Chimaeridae	pointynose blue ghostshark	Not Threatened		SO
<i>Isistius brasiliensis</i> (Quoy & Gaimard, 1824)	Dalatiidae	cookiecutter shark	Not Threatened		SO
<i>Isurus oxyrinchus</i> Rafinesque, 1810	Lamnidae	mako/shortfin mako	Not Threatened		S?O
<i>Lamna nasus</i> (Bonnaterre, 1788)	Lamnidae	porbeagle	Not Threatened		TO
<i>Mitsukurina owstoni</i> Jordan, 1898	Mitsukurinidae	goblin shark	At Risk – Naturally Uncommon		DP, SO
<i>Mobula birostris</i> (Walbaum, 1792)	Mobulidae	manta ray	Data Deficient		TO
<i>Mobula mobular</i> (Bonnaterre, 1788)	Mobulidae	spinetail devil ray	Data Deficient		SO
<i>Mustelus lenticulatus</i> Phillipps, 1932	Triakidae	rig/spotted dogfish	Not Threatened		CD
<i>Myliobatis tenuicaudatus</i> Hector, 1877	Myliobatidae	eagle ray	Not Threatened		DP, SO
<i>Notoraja alisae</i> Séret & Last, 2012	Arhynchobatidae	velcro skate	Data Deficient		
<i>Notoraja sapphira</i> Séret & Last, 2009	Arhynchobatidae	sapphire skate	Data Deficient		
<i>Notorhynchus cepedianus</i> (Peron, 1807)	Hexanchidae	broadnose sevengill shark	Not Threatened		DP, SO
<i>Odontaspis ferox</i> (Risso, 1810)	Odontaspidae	smalltooth sand tiger	At Risk – Naturally Uncommon		TO
<i>Oxynotus brunniensis</i> (Ogilby, 1893)	Oxynotidae	prickly dogfish	Not Threatened		DP, SO

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Conservation status of all known New Zealand chondrichthyans continued

SPECIES NAME	FAMILY NAME	COMMON NAME	CONSERVATION STATUS	CRITERIA	QUALIFIERS
<i>Parmaturus macmillani</i> Hardy, 1985	Pentanchidae	McMillan's cat shark	Data Deficient		S?O
<i>Prionace glauca</i> (Linnaeus, 1758)	Carcharhinidae	blue shark	Not Threatened		SO
<i>Pseudocarcharias kamoharai</i> (Matsubara, 1936)	Pseudocarchariidae	crocodile shark	Data Deficient		SO
<i>Pseudotriakis microdon</i> Capello, 1867	Pseudotriakidae	false cat shark	Data Deficient		SO
<i>Pteroplatytrygon violacea</i> (Bonaparte, 1832)	Dasyatidae	pelagic stingray	Not Threatened		SO
<i>Rhincodon typus</i> Smith, 1828	Rhincodontidae	whale shark	Migrant		SO
<i>Rhinochimaera pacifica</i> (Mitsukuri, 1895)	Rhinochimaeridae	longnose chimaera, Pacific spookfish	Not Threatened		DP
<i>Scymnodalatias albicauda</i> Taniuchi & Garrick, 1986	Somniosidae	whitetail dogfish	Data Deficient		S?O
<i>Scymnodalatias sherwoodi</i> (Archey, 1921)	Somniosidae	Sherwood's dogfish	Data Deficient		S?O
<i>Somniosus antarcticus</i> Whitley, 1939	Somniosidae	Pacific sleeper shark	Not Threatened		DP, S?O
<i>Somniosus longus</i> (Tanaka, 1912)	Somniosidae	little sleeper shark	Data Deficient		S?O
<i>Sphyrna zygaena</i> (Linnaeus, 1758)	Sphyrnidae	hammerhead / smooth hammerhead shark	Not Threatened		SO
<i>Squalus acanthias</i> Linnaeus, 1758	Squalidae	spiny dogfish	Not Threatened		SO
<i>Squalus griffini</i> Phillipps, 1931	Squalidae	northern / grey spiny dogfish	Not Threatened		SO
<i>Squalus raoulensis</i> Duffy & Last, 2007	Squalidae	Kermadec spiny dogfish	Data Deficient		
<i>Tetronarce fairchildi</i> (Hutton, 1872)	Torpedinidae	electric ray	Data Deficient		
<i>Triacodon obesus</i> (Rüppell, 1837)	Carcharhinidae	whitetail reef shark	Vagrant		
<i>Typhlonarke aysoni</i> (Hamilton, 1902)	Narcinidae	blind electric ray	Not Threatened		DP
<i>Typhlonarke tarakea</i> Phillipps, 1929	Narcinidae	oval electric ray	Not Threatened		DP
<i>Zameus squamulosus</i> (Gunther, 1877)	Somniosidae	velvet dogfish	Data Deficient		S?O
<i>Zearaja nasuta</i> (Banks in Müller & Henle, 1841)	Rajidae	rough skate	Not Threatened		CD
<b>Taxonomically indeterminate</b>					
<i>Apristurus</i> cf. <i>sinensis</i> Chu & Hu, 1981	Pentanchidae	freckled catshark	Data Deficient		
<i>Cephaloscyllium</i> sp. 1 cf. <i>variegatum</i> Last & White, 2008	Scyliorhinidae	swell shark / banded carpetshark	Data Deficient		
<i>Cephaloscyllium</i> sp. 2 cf. <i>variegatum</i> Last & White, 2008	Scyliorhinidae	banded carpetshark	Data Deficient		
<i>Hydrolagus</i> sp. 1 cf. <i>affinis</i> (de Brito Capello, 1868)	Chimaeridae	giant black ghostshark	Data Deficient		CD
<i>Mustelus</i> sp. 1	Triakidae	Kermadec smooth-hound	Not Threatened		
<i>Parmaturus</i> sp. 1	Pentanchidae	roughback catshark	Data Deficient		
<i>Scymnodon</i> sp. 1 cf. <i>ringens</i> Barbosa du Bocage & de Brito Capello, 1864	Somniosidae	knifetooth dogfish	Data Deficient		SO?
<i>Squalus</i> sp. 5	Squalidae	shortspine spiny dogfish	Data Deficient		
<i>Tetronarce</i> sp. 1 cf. <i>tokionis</i> (Tanaka, 1908)	Torpedinidae	slender electric ray	Data Deficient		

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