



Northeast Fisheries Science Center Reference Document 22-03

Serious Injury Determinations for Small Cetaceans and Pinnipeds Caught in Commercial Fisheries off the Northeast U.S. Coast, 2015-2019

by Elizabeth Josephson¹, Frank Wenzel², Marjorie Lyssikatos²

¹ Integrated Statistics, in support of NOAA Fisheries, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 04473

² NOAA Fisheries, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543

US DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts

March 2022

Northeast Fisheries Science Center (NEFSC)

Reference Documents

This series is a secondary scientific series designed to assure the long-term documentation of and to enable the timely transmission of research results by Center and/or non-Center researchers, where such results bear upon the research mission of the Center (see the outside back cover for the mission statement). These documents receive internal scientific review, and most receive copy editing. The National Marine Fisheries Service does not endorse any proprietary material, process, or product mentioned in these documents.

If you do not have internet access, you may obtain a paper copy of a document by contacting the senior Center author of the desired document. Refer to the title page of the document for the senior Center author's name and mailing address. If there is no Center author, or if there is corporate authorship, contact the Center's Woods Hole Laboratory Library (166 Water St., Woods Hole, MA 02543-1026).

Information Quality Act Compliance: In accordance with section 515 of Public Law 106-554, the NEFSC completed both technical and policy reviews for this report. These pre-dissemination reviews are on file at the NEFSC Editorial Office.

This document may be cited as:

Josephson E, Wenzel F, Lyssikatos M. 2022. Serious injury determinations for small cetaceans and pinnipeds caught in commercial fisheries off the northeast U.S. coast, 2015-2019. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 22-03; 35 p.

TABLE OF CONTENTS

Introduction.....	1
Methods.....	1
Results and Discussion	2
Small Cetaceans	2
Pinnipeds	3
Acknowledgements.....	4
Tables and Figures.....	5
Appendix.....	25
References.....	31

INTRODUCTION

The Marine Mammal Protection Act (MMPA) requires the National Marine Fisheries Service (NMFS) to estimate annual levels of human-caused mortality and serious injury to marine mammal stocks (section 117) and to categorize commercial fisheries based on their level of incidental mortality and serious injury of marine mammals (section 118). Serious injury (SI) determinations were addressed at NMFS-convened workshops in 1997 and 2007 (Angliss and DeMaster 1998; Andersen et al. 2008), and in January 2012, the agency published new national [guidelines for distinguishing serious from non-serious injuries of marine mammals \(National Policy for Distinguishing...2012\)](#). A major goal of the new guidelines was to establish national consistency and transparency in SI determinations. To implement the new guidelines, Science Center SI determination (SID) staff are required to annually review the observer (OBS) and at-sea monitor (ASM) records on all incidentally caught marine mammals that were released alive. Determinations made on these fishery interactions are independently reviewed by another center's SID (e.g., Northeast Fisheries Science Center [NEFSC] determinations are sent to the Southwest Fisheries Science Center [SWFSC], the Greater Atlantic Regional Fisheries Office [GARFO], and the Atlantic Scientific Review Group [ASRG] before final determinations are published in this document).

METHODS

Electronic records of all small cetacean and pinniped bycatch that were coded as alive or condition unknown for the 5-year period (2015-2019) were extracted from the Northeast Fisheries Observer Program (NEFOP) database. A principal component of these records included OBS/ASM notes that provided information on entanglement characteristics (e.g., animal in codend), crew handling (e.g., rope tied animal, animals lifted overboard), animal condition (e.g., cut on dorsal flank, some blood), and state of released animal (e.g., swam away quickly, swimming sluggishly at surface, immediately sank). These data were independently compared to small cetacean (S) and pinniped (P) criteria contained in the SI guidance document by 2 marine mammal researchers in the NEFSC Protected Species Branch. The 2 evaluators compared their determinations and discussed all differences to obtain agreement. Final injury determinations and mortality events were tabulated annually to estimate the proportion of observed SI animals relative to the other observed determinations (e.g., non-serious injury [NSI], uninjured [UI], and dead [D]) by gear type and species (Table 4). Proportions are used in stock assessment reports to partition the expanded bycatch estimate into SI vs. Mortality (Waring et al. 2016). Determinations for 2014-2018 have been previously published (Josephson et al. 2019). Cases where a determination could not be made were treated conservatively and included with the dead animals, and hence represented in the final mortality and serious injury estimates reported in the annual stock assessment reports (Hayes et al. 2020). Offshore, migratory, and estuarine coastal bottlenose dolphin (*Tursiops truncatus truncatus*) serious injury determinations were analyzed and reported by the NOAA Fisheries Southeast Fisheries Science Center (SEFSC; Maze-Foley et al. 2019).

Species codes and gear codes used in this report are contained, respectively, in Tables 1 and 2. The statistical area designations are presented in Figure 1.

RESULTS AND DISCUSSION

Small Cetaceans

In 2015, 3 small cetacean records were reviewed, 2 of which were determined to be SI cases; the other couldn't be determined (CBD). The 2 SI interactions were both Risso's dolphins (*Grampus griseus*) in bottom trawl gear, and category S4 was applied since both animals were brought on deck. A harbor porpoise (*Phocoena phocoena phocoena*) was seen by an observer on a gillnet trip. The observer described the animal as thrashing out of the net and swimming away quickly. This animal was designated CBD (Table 3).

In 2016, there were no observed interactions with small cetaceans categorized as alive or of unknown status recorded in NEFSC observer databases.

In 2017, there were 16 small cetacean records reviewed, plus 1 that was identified as an unknown marine mammal. Three Risso's dolphins had interactions with bottom trawl gear, 2 of which were determined to be serious injuries because they were brought on deck, and the third was put into the "dead" category. This last animal was noticed floating ventral side up behind the vessel during net retrieval and therefore put into the "dead" category. A harbor porpoise interaction with gillnet gear was designated as SI. While not brought on board, it remained at the surface with little movement after being freed from entangling wraps and was still at the surface when last seen. A white-sided dolphin (*Lagenorhynchus acutus*) caught in bottom trawl gear was brought on board in the belly of the net and dumped on deck. While the animal seemed vigorous after release, it may have retained a line around its tailstock that the crew had used to get it overboard. This dolphin was designated as SI because it was on deck. A common dolphin (*Delphinus delphis delphis*) released alive from gillnet gear was designated as SI under criteria S7b—entangled in gear but released gear-free. The dolphin was responsive and alert upon release, but not very active. Nine common dolphins (7 in the same haul) were coded by the observer as status unknown but were designated by the serious injury reviewers as dead. An unidentified dolphin taken in gillnet was also determined to be dead. The unidentified marine mammal was taken in trawl gear and designated as CBD as the animal was seen only briefly during haul back. While it seemed to free itself by making a large hole in the net, it was unknown whether there were any injuries or remaining entanglement. A 2017 bottlenose dolphin interaction previously reported here has been removed from this report and is now included in the SEFSC Serious Injury report (Maze-Foley et al. 2019).

In 2018, 2 small cetacean records were reviewed for serious injury determination. A common dolphin was recorded in the observer database as alive in bottom trawl gear. Few details were available for this animal, but as it was entrapped in the net before being cut out and released, and was exhibiting unusual behavior such as opening and closing its mouth, it was classified as SI. In addition, an unidentified dolphin was observed in gillnet gear. This animal was also classified as SI, as it was hauled out of the water by the roller and no movement was observed post-release.

In 2019, NEFSC reviewed 9 small cetacean records for serious injury determination. Seven of these were common dolphins with bottom trawl gear interactions, 4 of them on the same trip. Upon review of observer descriptions and photos, 2 of the common dolphins were classified as dead and 2 as SI, with the remaining 3 meriting CBD status due to lack of information collected.

The remaining 2 cetaceans reviewed in 2019 were recorded as an unidentified whale and unidentified dolphin. The "whale" was an animal brought on deck in the catch pile, probably in

the codend, described as being approximately 8' in length, but the observer had only a quick view before the animal was hoisted overboard with a rope around the tailstock. The animal sank out of view when the line was cut so it was most likely dead, but the species remains unknown. Two other bycatch mortalities on the same trip were harbor porpoises. The unidentified dolphin was perhaps a Risso's dolphin or pilot whale (*Globicephala* spp.) that had its caudal fin entangled in the tripper rope. After a line was cut, the animal was able to swim away, gear free, apparently unharmed. However, since details were scant and the species unknown, this record was classified as CBD.

In summary, 29 records of small cetaceans from 2015-2019 were reviewed for injury determination. Of these, 11 were designated as SI, 6 as CBD, and 12 as dead. Three common dolphins, 1 white-sided dolphin, and 4 Risso's dolphins were seriously injured as a result of interacting with bottom trawl gear. One dolphin of unknown species, 1 common dolphin, and 1 harbor porpoise sustained serious injury in sink gillnet gear. One unidentified marine mammal was classified as CBD in its interaction with trawl gear.

Pinnipeds

In 2015, 6 records of seals condition-coded as alive or unknown were reviewed. A harbor seal (*Phoca vitulina vitulina*) and an unidentified seal were observed as nonlethal interactions with gillnet gear. The harbor seal was determined to be NSI while the unidentified seal was CBD because of lack of information. Two gray seals (*Halichoerus grypus atlantica*) were observed in bottom trawl gear, 1 initially coded as alive and the other as unknown. Upon review of the log's details, the condition unknown animal was determined to be dead. The alive animal was determined to be an NSI under directive code P4 (Appendix, Table 3) since it was brought on deck but was seen swimming freely after release. There were 2 observed interactions in herring purse seine gear, both seals unidentified as to species, and both determined to be NSI since they were trapped temporarily but climbed over the float line and escaped.

In 2016, observers recorded 1 unknown species of seal and 5 gray seals bycaught in Gulf of Maine Atlantic herring purse seine sets. All of these interactions resulted in the seal swimming away alive and unharmed and were designated as NSI since they were trapped temporarily but climbed over the float line and escaped.

In 2017, 15 records of seals were reviewed for injury determination. One of these, a harbor seal interaction with bottom trawl gear, was determined to be NSI. Even though the seal was brought on board in the codend of the net, it was active and alert and showed no signs of injury. It dove into the water off the stern ramp. Ten gray seals in sink gillnet gear and 1 gray seal in bottom trawl gear were determined to be mortalities. Three unidentified seals, 2 in gillnets and 1 in a trawl, were also determined to be dead.

In 2018, 6 records of seals were reviewed for injury determination. One of these, an unidentified seal interaction with sink gillnet gear, was determined to be SI. Lack of movement noticed after release, combined with observation of bulging eye, led reviewers to classify that take as seriously injured if not dead. Three gray seals, 1 of them in herring purse seine gear and the other 2 in bottom trawl gear, were determined to be NSI. One gray seal and 1 unidentified seal interaction with sink gillnet gear did not have enough information to make a determination. Those cases were coded as CBD.

In 2019, 3 unidentified seals and 2 gray seals were reviewed for injury determination. The unidentified seals were reported on gillnet trips. None had enough information to make injury determinations or species identifications. A gray seal was cleared from gillnet gear while still in the water and determined to be NSI. Another gray seal was an interaction with handline fishing.

The handline fisherman lost multiple hooks and a significant amount of monofilament during the interaction. The animal was hooked on the dorsal side but broke free and disappeared. This interaction was classified as CBD because while SI was possible due to the quantity of line lost, NSI could not be ruled out.

In summary, from 2015-2019, 1 unidentified seal was seriously injured from observed bycatch in sink gillnet gear (Table 4), though quite a few records initially recorded by the observer as unknown condition were determined to have been mortalities and several records were classified as either NSI or CBD.

ACKNOWLEDGEMENTS

We thank the onboard observers and at-sea monitors for collecting the data and the staff in the Northeast Fisheries Science Center, Fisheries Sampling Branch, for their assistance in obtaining electronic copies of data logs and pictures required for our SI determinations. An earlier version of this document was reviewed by the Atlantic Scientific Review Group in February 2021. Also thanks to Sean Hayes and Michael Simpkins for their review of earlier versions of this document.

TABLES AND FIGURES

Table 1. List of marine mammal codes, common names, and scientific names.

Code	Common Name	Scientific name
CODO	Common dolphin	<i>Delphinus delphis delphis</i>
HAPO	Harbor porpoise	<i>Phocoena phocoena phocoena</i>
UNPW	Long-finned or short-finned pilot whale	<i>Globicephala</i> spp.
PPDO	Harbor porpoise or dolphin	
RIDO	Risso's dolphin	<i>Grampus griseus</i>
WSDO	Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>
UNDO	Unidentified dolphin	
GRSE	Gray seal	<i>Halichoerus grypus atlantica</i>
HASE	Harbor seal	<i>Phoca vitulina vitulina</i>
HPSE	Harp seal	<i>Pagophilus groenlandicus</i>
UNCE	Unidentified cetacean	
UNSE	Unidentified seal	
UNMM	Unidentified marine mammal	
UNWH	Unidentified whale	

Table 2. Northeast region commercial fishery gear codes.

Gear code	Gear description
HND	Hand Line
OTB	Otter trawl bottom
OTM	Midwater Otter trawl
OTR	Otter Ruhle trawl
OTH	Otter trawl haddock separator
PSH	Purse seine
SGN	Sink gillnet

Table 3. Comparison of fishery observer or at-sea monitor animal condition codes and Protected Species Branch (PSB) injury determinations (SI = serious injury, NSI = non-serious injury, UI = uninjured, CBD = cannot be determined) for the 5-year period 2015-2019. Determinations are based on observer notes and small cetacean and pinniped criteria in the National Marine Fisheries Service Determination Directive (NMFS 2012). Northeast Gear codes are listed in Table 2, statistical areas are shown in Figure 1, and species codes are listed in Table 1.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
OTB	622	08-Jul-2015	RIDO	alive		SI	S4	Caught in net belly. Alive, actively moving head/fins on deck. No wounds, marks, bleeding. Crew roped tail and used net drum to release. Animal floated belly-up in water for ~15 sec then started to move flippers, flipped over, and started swimming at surface. Went beneath surface ~1 min after release.
OTB	622	04-Mar-2015	RIDO	alive		SI	S4	Seen as net tripped, slid right to deck, head first. Only right side seen. Seen opening and closing mouth, not thrashing just slow movement of fins and fluke. Rake marks seen on R-side of body. No other wound, mark or bleeding seen. On deck ~3 min. Green rope (same as used on codend) tied around tail, lifted over stern ramp w/ crane. Rope snapped dropping directly into water headfirst, tail may have hit ramp, rope still attached. Engine neutral, gear out of H ₂ O. Seen in water ~1 min, swam away slowly.
SGN	537	26-Apr-2015	HAPO	alive		CBD		Never came out of water. Only dorsal surface was seen by observer ~8-10 secs. No wounds, marks, or bleeding seen. No odors or tissue left on gear, no noise made. Animal thrashed out of the net, splashed, and swam away quickly (~1-2 secs.).

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
SGN	513	17-Sep-2015	HASE	alive		NSI	P4	Entangled with head and front flippers through mesh. Came up unresponsive but after ~30 secs. began to foam from nostrils (~3 tbps) and move slightly. No other wounds, marks, or bleeding seen. Placed on back of vessel until end of haul, ~30 mins. Was looking around, alert. Released by crew w/ boat in neutral, swam circles around the boat a few times, then began to follow for ~1 min. as boat started to steam.
OTB	521	28-Sep-2015	GRSE	unknown	dead	DEAD		First spotted seal after codend was dumped out covered in catch. Seal was orientated belly down and head up. None of the body parts were entangled in the net. Observer was able to pull the seal out of the pile to a better spot to be sampled. When touching the seal, the body was very firm to stiff.
OTB	525	07-Apr-2015	GRSE	alive		NSI	P4	Came out of belly of net when bag was tripped. On deck ~3-5 mins. Crew deck hoses, feet, and brooms to push off deck. No wounds, marks, or bleeding seen. Once stern ramp was reached, seal slid down ramp into water head first, surfaced about 2 secs. later, and was observed swimming freely at surface.
SGN	537	08-Feb-2015	UNSE	unknown		CBD		Seal reported by captain, obs seasick. Captain information unclear if dead or alive when released.
PSH	512	24-Oct-2015	UNSE	alive		NSI		Trapped in bunt during pumping but escaped over floatline after pumping complete. Seen surfacing for a minute or 2 at a time but disappeared below catch. After pumping, seen climbing over floatline - no injuries seen.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
PSH	512	24-Oct-2015	UNSE	alive		NSI		Trapped in bunt during pumping but escaped over floatline after pumping complete. Seen surfacing for a minute or two at a time, but disappeared below catch. After pumping seen climbing over floatline - no injuries seen.
PSH	512	01-Oct-2016	UNSE	unknown		NSI		When the contents of the net were released, it rolled out of the net and into the water due to gravity. The observer wasn't sure if they ever saw the animal move or not. Too dark to be able to tell if it swam away or sank. ID of the seal not confirmed, but observer saw light gray/tan coat with mottled dark spots. Approximately 4 feet long. Photos and videos confirm uninjured.
PSH	512	01-Oct-2016	GRSE	alive		NSI		Did not appear to be injured or entangled. Never made contact with walls of net. Observed swimming over floatline.
PSH	512	01-Oct-2016	GRSE	alive		NSI		Did not appear to be injured or entangled. Never made contact with walls of net. Observed swimming over floatline.
PSH	512	01-Oct-2016	GRSE	alive		NSI		Did not appear to be injured or entangled. Never made contact with walls of net. Observed swimming over floatline.
PSH	512	01-Oct-2016	GRSE	alive		NSI		Did not appear to be injured or entangled. Never made contact with walls of net. Observed swimming over floatline.
PSH	512	01-Oct-2016	GRSE	alive		NSI		Did not appear to be injured or entangled. Never made contact with walls of net. Observed swimming over floatline.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
OTB	514	02-Jan-2017	HASE	alive		NSI	P4	Observer first saw it in the codend as the net was coming on board. Was sitting on top of catch right side up, active, alert. No signs of injury. Approx. 6 mins. after coming on deck, it dove into water off stern ramp. Did not resurface.
OTB	616	28-Mar-2017	RIDO	alive		SI	S4	On deck for ~ 5 min., 2" cut around throat. Blood between pecs and around peduncle. Released by crew by tying rope around fluke and towing off stern with drum reel. Crew said release left no gear on animal, went in head first, did not resurface. Videos taken.
SGN	636	26-Mar-2017	CODO	alive		SI	S7b	Dolphin alive with fluke and peduncle wrapped in net. Dolphin pulled alongside and disentangled by capt. Responsive and alert – eyes and mouth moving – but not very active. No visible wounds. Swam away when lowered into water. No gear left on animal.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	526	26-Mar-2017	GRSE	unknown	dead	DEAD		Take fell out of the net before reaching the hauler. No details available on condition. No photos taken. Sank immediately at release.
SGN	515	02-Apr-2017	HAPO	alive		SI	S7b	When net was being brought up, animal began to thrash around and freed itself. No wounds seen. Once free from net, stayed at surface with little fin movement. Bubbles could be seen coming from blowhole when waves washed over. Last seen still floating at surface after ~1-2 mins.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
OTB	626	12-Apr-2017	RIDO	alive		SI	S4	Once the animal was around the net drum, it ripped through the net and landed on its side on deck; let out a "croaking" noise. Animal was alive but not active or responsive to touch. Bubbles were seen coming from blow hole. Rope was tied around tail stock, animal was lifted, and then rope (knot still around tail) was cut, releasing animal back into water, dolphin floated sluggishly at surface with head out of water but was then surrounded by other dolphins and obs lost sight.
OTB	616	14-Apr-2017	RIDO	unknown	dead	DEAD		Dolphin observed floating ventral side up 120-150 feet behind vessel. No visible injuries.
OTB	515	31-Jun-2017	UNMM	unknown		CBD		Take seen in net when hauling gear on board. Net was lowered from deck to water to shake catch into codend and when it was pulled back up the mammal was gone. A large hole was seen in the belly of the net.
OTB	537	08-Jul-2017	UNSE	unknown	dead	DEAD		Take was seen in the mouth of the net. Crew member said the animal had a very strong odor, was bloated, and organs were protruding from the body. Since observer was unable to see take for more than a few seconds, determined animal condition to be unknown, although likely dead, severe decomposition.
OTB	562	08-Jul-2017	WSDO	alive		SI	S4	Animal on top of the fish pile when dumped on deck. Moving tail around. No wounds, marks, scars seen. Rope tied around tail stock to put overboard, rope was possibly still attached to the dolphin once in the water. Dolphin was seen in water after release and dove straight under.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
SGN	521	03-Aug-2017	UNSE	unknown	dead	DEAD		Animal fell out of gear as it was being hauled. Unknown if sank/float at release. No photos/samples taken.
SGN	512	09-Aug-2017	UNSE	unknown	dead	DEAD		Only a glimpse of take in net. Unknown if sank/float at release. No photos/samples taken.
OTB	537	27-Aug-2017	GRSE	unknown	dead	DEAD		Animal on top of pile after net was tripped into checker pen. Unknown if alive or dead. Eyes were intact and lifelike, no fur sloughing off, no odor, warm to touch. Some liquid coming from nose, but no noticeable injuries. Take was moved overboard by wrapping a rope around the rear flippers and pushing it down ramp. Take sank immediately upon release.
OTB	537	05-Aug-2017	CODO	unknown	dead	DEAD		Take on deck. Unknown animal condition. No odor noticed, skin not flaking off, eyes dark, clear and intact. Moved off vessel with rope around tail. Unknown if sank/floated upon release or if any gear was left on.
OTB	537	05-Aug-2017	CODO	unknown	dead	DEAD		Take on deck. Unknown animal condition. No odor noticed, skin not flaking off, eyes dark, clear and intact. Moved off vessel with rope around tail. Unknown if sank/floated upon release or if any gear was left on.
OTB	537	05-Aug-2017	CODO	unknown	dead	DEAD		Take on deck. Unknown animal condition. No odor noticed, skin not flaking off, eyes dark, clear and intact. Moved off vessel with rope around tail. Unknown if sank/floated upon release or if any gear was left on.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
OTB	537	05-Aug-2017	CODO	unknown	dead	DEAD		Take on deck. Unknown animal condition. No odor noticed, skin not flaking off, eyes dark, clear and intact. Moved off vessel with rope around tail. Unknown if sank/floated upon release or if any gear was left on.
OTB	537	05-Aug-2017	CODO	unknown	dead	DEAD		Take on deck. Unknown animal condition. No odor noticed, skin not flaking off, eyes dark, clear and intact. Moved off vessel with rope around tail. Unknown if sank/floated upon release or if any gear was left on.
OTB	537	05-Aug-2017	CODO	unknown	dead	DEAD		Take on deck. Unknown animal condition. No odor noticed, skin not flaking off, eyes dark, clear and intact. Moved off vessel with rope around tail. Unknown if sank/floated upon release or if any gear was left on.
OTB	537	05-Aug-2017	CODO	unknown	dead	DEAD		Take on deck. Unknown animal condition. No odor noticed, skin not flaking off, eyes dark, clear and intact. Moved off vessel with rope around tail. Unknown if sank/floated upon release or if any gear was left on.
SGN	539	20-Oct-2017	UNDO	unknown	dead	DEAD		Take was seen in net with entanglement concentrated around the fluke. Once net around fluke was cut, dolphin went under surface and sank immediately.
OTB	622	21-Oct-2017	CODO	unknown	dead	DEAD		Take first noticed when codend was tripped into checker pen. Unknown animal condition; no odor detected, no movement noted while on deck. Floated upon release.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
OTB	537	18-Oct-2017	CODO	unknown	dead	DEAD		Take noticed after net was tripped into checker pen and being set for next haul. Condition unknown; no notice of movement. Take was moved off the boat at the stern by rope around caudal peduncle; rope was cut to release. Unknown if sank/float at release.
OTB	537	21-May-2018	GRSE	alive		SI	P4, P7b	Take noticed while codend was emptied into checker pen, unknown where in catch pile take was when net tripped. Alert, erratically whipping head, looking wide-eyed, mouth open, not barking/making noise, eyes intact/clear. Did not attempt to attack/bite crew. No coughing or foam around mouth or nose noted. Quarter-sized, pink, not bleeding wound on R pec flipper, no other wounds, marks, or scars noted. Crew member grabbed by hind flippers and slid take down the stern where it immediately dove out of sight, unknown if resurfaced after release. No gear left on.
OTB	538	23-May-2018	GRSE	alive		NSI	P4, P7b	Take noticed in belly of net, net reeled up little by little to shake out, tumbled few feet at a time until it tumbled into checker pen. Gear never rested on top of take. Initially motionless, thought to be dead, after <30 secs. in checker pen, took 2 large breathes before awaking, bearing teeth and growling. No wounds, marks, scars, indents. No coughing or foam around nose or mouth. Crew member grabbed by hind flippers when take was not looking, released when it whipped around to bite, and repeated when take was not looking. Slid down the stern where it immediately dove out of sight, unknown if resurfaced after release. No gear left on. Whole interaction ~40 secs.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
SGN	521	24-Jun-2018	UNSE	unknown		CBD	P7b	Observer saw 1 hind flipper break water surface, tension on net from hauler caused seal to break free from net before any more of the animal could be lifted out of the water. Seal became free from net and went back under water, it was not seen again. Unknown which species. Unknown if dead/alive. No blood seen in water.
SGN	521	24-Jun-2018	UNSE	unknown		SI	P9	Seal came up in net, head made it over gunnel before hauler before falling from the gear back into the water as captain tried to pull the net onboard. No large holes or damage seen in net after, gear nor animal were cut. Obs was able to see face for 2-3 secs., eye seen appeared to be bulging and had visible red veins. No odor. Take occurred during early hours of morning, too dark out to see detail. Seal was not seen in water once if fell from the gear. Unknown if dead/alive. No blood seen. Unknown if tagged. No photos taken. Take 2 of 3 on this trip.
OTB	537	31-Sep-2018	CODO	alive		SI	S7b	Dolphin was ventral side up vertical in net w/ head facing bow, only first half of face sticking through net, the rest of the body was within the net. Very active, opening and closing mouth like eating fish. Crew member stood on edge of stern and pulled net toward him, cut the net directly below the animal. Take then fell from gear head first into water. Take was not seen in the water after. No damage or blood seen.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
HPS	512	02-Sep-2018	GRSE	alive		NSI		Take noticed when floatline of net was raised overhead while catch was being pumped onboard. Alive: initially swam erratically at surface, noticed popping above/below water with help of spot light on deck. Floatline dropped immediately once seal was noticed, did not attempt jumping gear, so it was raised again + pumping of catch continued. Take ~8-10' from pump, did not seem alarmed/concerned of pump, not feeding on catch. No wounds/marks/scars/blood visible. After pumping catch ~15 mins., topline was dropped a second time, take swam over floatline, dove immediately, did not resurface.
SGN	611	31-Oct-2018	GRSE	alive		CBD	P9	Take seen following vessel for ~2 hauls grabbing striped bass from string. Captain saw seal approaching vessel and screamed to crew, "He's coming after us!" Crew promptly handed cpt a long stick + cpt leaned over side hauler stretched out + swung to hit the seal once. Unk if cpt made contact w/ seal, it dove below water as the stick made contact w/ surface. Alive: no noticeable injuries/blood/wounds, Eyes open and alert. Disappeared beneath water and did not resurface for the rest of trip. No gear seen attached, disappeared beneath water and did not resurface for the rest of trip.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
SGN	537	19-Dec-2018	UNDO	unknown		SI	S7b	Take came mostly out of the water, when head came up to roller, it fell out of gear due to force of roller. Unk if any indents from gear or gear left on, obs only saw head and pec flippers. Unk condition: no movement or noises noticed, skin taunt + shiny, R eye clear/black/shiny, no blood/fluids/foam seen. Unk condition of L eye and body posterior to R+L pec flippers. ID: solid grey coloration for head + R+L pec flippers, prominent rostrum. Unk if any wounds/marks/scars, blood present, none visibly seen on head + R+L pec flippers. Release: disappeared under the waves, did not resurface, no thrashing or signs of movement seen.
OTB	515	15-Mar-2019	CODO	Unk	DEAD	DEAD		First seen hanging by caudal fin from net ~5' from start of codend, rip in net belly caused animal to fall from gear before exiting water. No gear attached when it fell from net. Obs unable to see take once in water, unk if sank or float, take occurred at night. Description is consistent with mortality.
OTB	616	15-Oct-20019	CODO	Alive		SI	S4	Animal on deck, crew had rope around fluke, body hanging vertically and spinning, w/ crew moving animal toward the stern. Animal was seen moving on its own and was deemed alive but sluggish/lethargic.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
OTB	613	19-Nov-2019	CODO	Alive		SI	S4	Animal seen in belly of net, shaken down to codend to release from net. Animal seemed in poor condition and was not very lively while on deck. Once out of gear, animal was on deck for ~1-2 mins. Crew lifted the animal and moved it to the stern ramp where it was released w/ no gear attached. Once put down stern ramp, animal seen at surface of water, possibly floating.
OTB	622	02-Jan-2019	CODO	Unk	DEAD	DEAD		Take noticed after codend was tripped, crew believed it was in the center of the catch, no movement visible + bobbing at surface and disappeared into the dark. Photo showed broken/dislocated pectoral flipper; both jaws appear white w/ skin loss.
OTB	622	02-Jan-2019	CODO	Alive, seen by captain or crew only		CBD		Three dolphins noticed in codend while bag was being pulled in, bag never brought aboard. Cpt + crew noted PSID 02-04 on top of bag/catch, easily visible + moving. Mouth of net was dropped + dipped back into water to allow escape, codend was tripped to discard rest of catch.
OTB	622	02-Jan-2019	CODO	Alive, seen by captain or crew only		CBD		Three dolphins noticed in codend while bag was being pulled in, bag never brought aboard. Cpt + crew noted PSID 02-04 on top of bag/catch, easily visible + moving. Mouth of net was dropped + dipped back into water to allow escape, codend was tripped to discard rest of catch.

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
OTB	622	02-Jan-2019	CODO	Alive, seen by captain or crew only		CBD		Three dolphins noticed in codend while bag was being pulled in, bag never brought aboard. Cpt + crew noted PSID 02-04 on top of bag/catch, easily visible + moving. Mouth of net was dropped + dipped back into water to allow escape, codend was tripped to discard rest of catch.
OTB	561	07-Mar-2019	UNWH	Unk		CBD (SI or DEAD nut species unknown)	S4	Take was found in catch pile, assumed to have been in codend with catch when dumped. Obs saw dark charcoal colored fluke w/ light gray pattern on sides, ~2' in width. Take was suspended by rope around tail stock hanging over side of boat. Rope was cut, take fell into the water and sank immediately, unk amt of rope attached to animal. No obvious wounds/damage/ blood/decomposition seen but dead, unk cond kept due to little amt of time and percent of body seen.
OTB	616	08-Nov-2019	UNDO	Alive, seen by captain or crew only		CBD		Captain told observer a cetacean was entangled by its caudal fin in the tripper rope as trawl gear was hauled in. Capt cut 1 tripper rope near animal, dolphin was able to free itself at this point and swam away immediately, no gear remaining on body, appeared unharmed + no damage seen by crew/capt. Obs did not see animal, capt referred to animal as Pilot whale but animal photographed in area around same time as a sighting event was ID'd as a Risso's Dolphin.
SGN	521	26-Jun-2019	UNSE	Unk		CBD		Take came up in unknown orientation, never came aboard

NEGEAR	Statistical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition	PSB Determination	NMFS 2012 SI Determination Directive	PSB comments regarding determination
SGN	521	26-Jun-2019	UNSE	Unk		CBD		Seen by captain in gear while in the net overboard. Capt let obs know he cut the seal out of the gear because it was too big to bring through hauler safely without damaging gear further. Capt unable to confirm condition or species, take recorded as unknown condition as seal, nk. No photos taken.
SGN	513	22-Apr-2019	UNSE	Unk		CBD		Seen by captain in gear while in the net overboard. Capt let obs know he cut the seal out of the gear because it was too big to bring through hauler safely without damaging gear further. Capt unable to confirm condition or species, take recorded as unknown condition as seal, nk. No photos taken.
SGN	521	26-Jun-2019	GRSE	Alive		NSI	P7b	Take noticed first by cpt in gear while hauling string poking head out of water, cpt + crew moved down side of vessel to help seal out of gear, but appeared to have freed itself. Unk orientation in gear, unk if solely involved w/ meshes or if lead/floatline involved. Snorted at crew, did not attempt to bite or growl.
handline	515	01-Mar-2019	GRSE	Alive, gear in or around several body parts		CBD		Take was hooked on dorsal side, unk if in back or R/L sides + unk of gear entangled around any portion of take, unk if more than 1 hook attached, cpt lost 4 hooks during interaction. Cpt continued to fish + bring up gear during interaction, unk amount of monofilament line lost during interaction, but noted it was a significant amount of line. Alive: take noted to be swimming at surface intermediately going under water + popping up at surface, not struggling to swim/breathe, no splashing or noises made. Unclear whether P5d (NSI) or P6 (SI).

Table 4. Summary of animal conditions (D = dead; DC = decomposed carcass; SI = serious injury; NSI = non-serious injury; UI = uninjured; CBD = could not be determined) by gear type, species, and year.

Gear Type	Species	Year	Dead		Alive[1]				Proportions	
			D[2]	DC[3]	SI	NSI	UI	CBD	Total [4]	% SI
Bottom Trawl	Harp Seal (<i>Pagophilus groenlandicus</i>)	2015							0	0.0%
		2016							0	0.0%
		2017							0	0.0%
		2018							0	0.0%
		2019	1	1					1	0.0%
	Common Dolphin (<i>Delphinus delphis delphis</i>)	2015	30	2					30	0.0%
		2016	24						24	0.0%
		2017	66	2					66	0.0%
		2018	38	3	1				39	2.6%
		2019	51	1	2			3	53	3.6%
	Gray Seal (<i>Halichoerus grypus atlantica</i>)	2015	3	1		1			4	0.0%
		2016	3						3	0.0%
		2017	7						7	0.0%
		2018	10		1	1			12	8.3%
		2019	7	2					7	0.0%
	Harbor Porpoise (<i>Phocoena phocoena phocoena</i>)	2015							0	0.0%
		2016							0	0.0%
		2017							0	0.0%
		2018							0	0.0%
		2019	2	3					2	0.0%
	Harbor Seal (<i>Phoca vitulina vitulina</i>)	2015	1						1	0.0%
		2016							0	0.0%
		2017				1			1	0.0%
		2018	1						1	0.0%
		2019	2						2	0.0%
	Pilot Whale (<i>Globicephala</i> spp.)	2015							0	0.0%
		2016	4						4	0.0%
		2017		1					0	0.0%
		2018							0	0.0%
		2019	1	1					1	0.0%
	Risso's Dolphin (<i>Grampus griseus</i>)	2015	1		2				3	66.7%
		2016	6						6	0.0%
2017		5		2				7	28.6%	
2018								0	0.0%	
2019								0	0.0%	
White-sided Dolphin (<i>Lagenorhynchus acutus</i>)	2015	3	4					3	0.0%	
	2016	4						4	0.0%	
	2017	1	1	1				2	50.0%	
	2018							0	0.0%	
	2019	14	8					14	0.0%	

Gear Type	Species	Year	Dead		Alive[1]				Proportions	
			D[2]	DC[3]	SI	NSI	UI	CBD	Total [4]	% SI
Sink Gillnet	Risso's Dolphin (<i>Grampus griseus</i>)	2015								
		2016								
		2017								
		2018								
		2019		1					1	0.0%
	Common Dolphin (<i>Delphinus delphis delphis</i>)	2015	3	3					6	0.0%
		2016	8	1					9	0.0%
		2017	21		1				22	4.5%
		2018	10	1					11	0.0%
		2019	3	1					4	0.0%
	Gray Seal (<i>Halichoerus grypus atlantica</i>)	2015	127	5					132	0.0%
		2016	39	5					44	0.0%
		2017	158						158	0.0%
		2018	95	7				1	102	0.0%
		2019	247	7		1			255	0.0%
	Harbor Porpoise (<i>Phocoena phocoena phocoena</i>)	2015	21	4				1	25	0.0%
		2016	12	1					13	0.0%
		2017	19		1				20	5.0%
		2018	9						9	0.0%
		2019	29	6					35	0.0%
	Harbor Seal (<i>Phoca vitulina vitulina</i>)	2015	83	9		1			93	0.0%
		2016	37	1					38	0.0%
		2017	64						64	0.0%
		2018	25						25	0.0%
		2019	60	4					64	0.0%
	Harp Seal (<i>Pagophilus groenlandicus</i>)	2015	12						12	0.0%
		2016	5						5	0.0%
		2017	6						6	0.0%
		2018	11	1					12	0.0%
		2019	33	2					35	0.0%

Gear Type	Species	Year	Dead		Alive[1]				Proportions	
			D[2]	DC[3]	SI	NSI	UI	CBD	Total [4]	% SI
Midwater Trawl	Harbor Seal (<i>Phoca vitulina vitulina</i>)	2015	2						2	0.0%
		2016	1						1	0.0%
		2017							0	0.0%
		2018							0	0.0%
		2019							0	0.0%
	Pilot Whale (<i>Globicephala</i> spp.)	2015							0	0.0%
		2016	3						3	0.0%
		2017							0	0.0%
		2018							0	0.0%
		2019							0	0.0%
Purse Seine	Gray Seal (<i>Halichoerus grypus atlantica</i>)	2015							0	0.0%
		2016				5			5	0.0%
		2017							0	0.0%
		2018				1			1	0.0%
		2019							0	0.0%
Hand Line	Gray Seal (<i>Halichoerus grypus atlantica</i>)	2015							0	0.0%
		2016							0	0.0%
		2017							0	0.0%
		2018							0	0.0%
		2019						1	0	0.0%

[1] Animals included under the alive category include animals with the following animal conditions: 0 – unknown; 1 – alive; 04 – alive, hook/gear in/around mouth; 05 – alive, hook/gear in/around flipper; 06 – alive, hook/gear in/around another single body part; 07 – alive, hook/gear in/around several body parts; 08 – alive, seen by captain and/or crew only.

[2] Animals included under the dead category include the following animal conditions: 10 – dead, condition unknown; 11 – dead, fresh; 14 – dead, seen by captain/crew only.

[3] Animals included under the decomposed carcass category include the following animal conditions: 12 – dead, moderately decomposed; 13 – dead, severely decomposed.

[4] Decomposed carcass category (DC) values are not included in bottom trawl totals but are in gillnet totals.

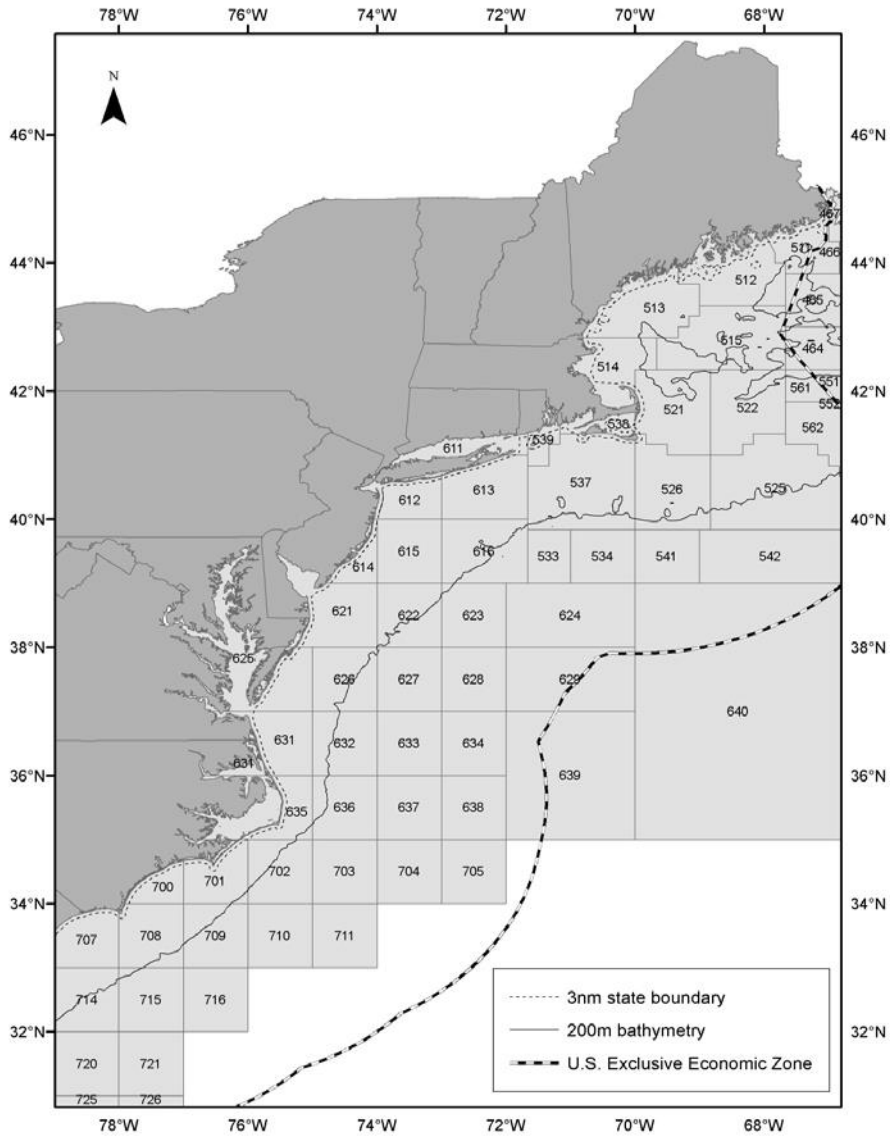


Figure 1. Fishery statistical areas.

APPENDIX

Tables 2 and 3 from the National Marine Fisheries Service (NMFS) [procedure manual](#)

Table 2: Summary of Small Cetacean¹ Injury Categories and Criteria

Instructions: Each small cetacean injury event is recorded to the appropriate injury/information category using all available information and scientific judgment, as described in the Procedural Directive. For a single injury event to which several categories apply, the injury determination with the highest level of severity is assigned. More detailed information or extended observation on an individual case/animal may justify a determination differing from the guidance of this table.

Category	Injury/Information	Injury Determination ²	Additional factors for evaluating whether “case specific” injuries are serious or non-serious (additional factors at end of table)
S1	A free-swimming animal observed at a date later than its human interaction, exhibiting signs of declining health believed to be resulting from initial injury (e.g., a marked skin discoloration, fat loss)	SI ³	
S2	Ingested gear ⁴ or hook(s)	SI	
S3	Visible blood loss	Case specific ⁵	Amount of blood, location of the bleeding injury, duration of bleeding
S4	Animal brought on vessel deck following entanglement/entrapment (excluding scientific research targeting marine mammals and authorized as such under an NMFS scientific research permit, where the animal is brought on and placed on the vessel deck in a controlled manner)	SI	
S5a	Hook(s) in head (excluding criterion S5b), regardless of the presence of gear	SI	
S5b	Hook(s) confirmed in lip only, external tissue outside of teeth, no trailing gear	Case specific	Prolonged restraint or struggle that could lead to capture myopathy, size of hook, depth of hooking, impairing ability to feed, presence of other injuries
S5c	Hook(s) in any body part, but hook(s) is removed or pulled out	Case specific	Prolonged restraint or struggle that could lead to capture myopathy, depth of hook, hook pulls out cleanly vs. causes further injury during dehooking, method used to remove hook, length of time hooked
S5d	Hook(s) in appendage or body (excluding criterion S5a), without trailing gear or with trailing gear that does not have the potential ⁶ to: 1) become a constricting wrap on animal; 2) be ingested; 3) accumulate drag; or 4) become snagged on something in the environment, anchoring the animal	Case specific	Prolonged restraint or struggle that could lead to capture myopathy, depth and location of hook, type and amount of gear attached

Category	Injury/Information	Injury Determination²	Additional factors for evaluating whether “case specific” injuries are serious or non-serious (additional factors at end of table)
S6	Gear attached to free-swimming animal with potential ⁷ to: 1) become a constricting wrap on animal; 2) be ingested; 3) accumulate drag; or 4) become snagged on something in the environment, anchoring the animal	SI	
S7a	Anchored, immobilized, or entrapped and not freed	SI	
S7b	Anchored, immobilized, entangled, or entrapped before being freed without gear attached	Case specific	Duration of entanglement/entrapment, prolonged restraint or struggle that could lead to capture myopathy, gear type, where/how gear is attached to animal, associated injury (i.e., where directly or indirectly caused by initial entanglement), response of individual animal, method used by human to remove gear from animal
S8a	Gear wrapped and constricting on any body part or is likely to become constricting as the animal moves or grows	SI	
S8b	Gear wrapped and loose on any body part	Case specific	Gear type, amount of gear, potential for snag, potential to lead to criterion S8a, animal body size relative to gear (e.g., because of species or age), effect on animal movement, species sensitivity (e.g., frightens easily)
S9	Body trauma ⁸ not covered by any other criteria	Case specific	Location of wound, depth (e.g., superficial or to the bone, penetrating muscle or organs), length, number of lacerations, cleanliness (i.e., compression vs. tearing)
S10	Visible fracture(s), excluding pectoral fins (see criterion S13d for pectoral fin fractures)	SI	
S11	Vertebral transection, including fully severed flukes	SI	
S12	Body cavity penetration ⁹ by foreign object or body cavity exposure	SI	
S13a	Loss or disfigurement of dorsal fin	Case specific	Cleanliness (i.e., compression vs. tearing), nature of injury causing the loss, extent of fin loss (i.e., full or partial), amount and duration of blood loss
S13b	Partially severed flukes, transecting midline	SI	
S13c	Partially severed flukes, not transecting midline	Case specific	Cleanliness (i.e., compression vs. tearing), nature of injury causing the loss, amount and duration of blood loss

Category	Injury/Information	Injury Determination ²	Additional factors for evaluating whether “case specific” injuries are serious or non-serious (additional factors at end of table)
S13d	Partially or completely severed or fractured pectoral fin(s)	Case specific	Cleanliness (i.e., compression vs. tearing), nature of injury causing the loss, extent of fin loss (i.e., full or partial), amount and duration of blood loss, opened or closed fracture
S14	Social animal separated from group and/or released alone post-interaction (excluding criterion S15)	Case specific	Species (e.g., sensitivity, offshore vs. inshore), location of release (e.g., likelihood of animal locating its conspecifics)
S15	Dependent animal (i.e., calf, juvenile) released alone post-interaction or dependent animal left with a seriously injured or dead mother	SI	
S16	Observed or reported collision with vessel	Case specific	Speed of vessel, size of vessel, hull shape, part of vessel to strike the animal, size of animal compared to size of vessel, behavior of animal after collision, extent and location of wound(s) on animal

¹ For the purposes of this table, small cetaceans include all odontocetes except sperm whales.

² This table includes on only those criteria determined to be serious injuries or case specific based on expert opinion at the 2007 Workshop (Andersen et al. 2008) and by small cetacean experts on the NMFS Determination Staff working group. For the purposes of streamlining the information for the reader, criteria determined to be non-serious injuries are not included in this table.

³ SI = serious injury.

⁴ For the purposes of this table, gear is defined as any portion of fishing gear excluding the hook, which is considered separately. Lures are considered gear. Gear also generally refers to any type of debris entangling or attached to the animal.

⁵ Case specific scenarios could be a serious or non-serious injury, but either 1) there is insufficient information about the impact of a particular injury, or 2) additional factors must be considered on a case-by-case basis to determine the severity

⁶ For the purposes of this table, “potential” as it relates criterion S5d indicates that the trailing gear IS NOT capable of leading to any of the situations listed.

⁷ For the purposes of this table, “potential” as it relates criterion S6 indicates that the trailing gear IS capable of leading to any of the situations listed.

⁸ For the purposes of this table, “trauma” is defined as a wound or bodily harm caused by an extrinsic agent. Blunt trauma is an injury (abrasion, laceration, contusion, or skeletal fracture) produced by a blunt object striking the body or impact of the body against a blunt object or surface. Sharp force trauma is an injury caused by a sharp or pointed object creating a penetrating (stab, chop, or incision) wound. Laceration is defined as a ragged incision or a tearing of the skin. Lacerations are caused by blunt trauma that results in stretching, tearing, crushing, shearing, or avulsion of the tissue.

⁹ For the purposes of this table, “penetration” is defined as a wound occurring when a foreign object punctures the body. Penetrating wounds can be characterized as 1 of 3 types: stab (small external wound that is greater in length into the body than is apparent on the skin surface), incised (clean cuts into the skin which are longer on the skin surface than they are deep), or chop wounds (incised wounds that penetrate deep to the bone, leaving a groove or cut in the bone).

Table 3: Summary of Pinniped¹Injury Categories and Criteria

Instructions: Each pinniped injury event is recorded to the appropriate injury/information category using all available information and scientific judgment, as described in the Procedural Directive. For a single injury event to which several categories apply, the injury determination with the highest level of severity is assigned. More detailed information or extended observation on an individual case/animal may justify a determination differing from the guidance of this table. Any injury leading to apparent significant health decline (e.g., skin discoloration, fat loss) is a serious injury.

Category	Injury/Information	Injury Determination ²	Additional factors for evaluating whether “case specific” injuries are serious or non-serious (additional factors at end of table)
P1	A free-swimming animal observed at a date later than its human interaction, exhibiting signs of declining health believed to be resulting from initial injury (e.g., a marked change in body condition, tissue necrosis, emaciation, gangrene)	SI ³	
P2	Ingested gear ⁴ or hook(s)	SI	
P3	Visible blood loss	Case specific ⁵	Amount of blood, location of the bleeding injury, duration of bleeding
P4	Animal brought on vessel deck following entanglement/entrapment (excluding scientific research targeting marine mammals and authorized as such under an NMFS scientific research permit, where the animal is brought on and placed on the vessel deck in a controlled manner)	Case specific	Manner in which animal is brought on deck, length of time animal is on deck, environmental conditions (e.g., temperature)
P5a	Hook(s) in mouth (excluding criterion P5b), regardless of the presence of gear	SI	
P5b	Hook(s) confirmed in head (excluding criterion P5a), or in lip only (external tissue outside of teeth), no trailing gear	Case specific	Location on head (e.g., eye), depth of penetration, type of hook, prolonged restraint or struggle that could lead to capture myopathy, size of hook, impairing ability to feed
P5c	Hook(s) in any body part, but hook(s) is removed or pulled out	Case specific	Prolonged restraint or struggle that could lead to capture myopathy, location of hooking on the body, depth of hook, hook pulls out cleanly vs. causes further injury during dehooking, method used to remove hook, length of time hooked
P5d	Hook(s) in appendage or body (excluding criteria P5a-c and P12), without trailing gear or with trailing gear that does not have the potential ⁶ to: 1) become a constricting wrap on animal; 2) be ingested, 3) accumulate drag; or 4) become snagged on something in the environment, anchoring the animal	NSI ⁷	

Category	Injury/Information	Injury Determination²	Additional factors for evaluating whether “case specific” injuries are serious or non-serious (additional factors at end of table)
P6	Gear attached in any manner to free-swimming animal with potential ⁸ to: 1) become a constricting wrap on animal; 2) be ingested; 3) accumulate drag; or 4) become snagged on something in the environment, anchoring the animal	SI	
P7a	Anchored/immobilized and not freed	SI	
P7b	Anchored, immobilized, or entangled before being freed without gear attached	Case specific	Duration of entanglement, prolonged restraint or struggle that could lead to capture myopathy, type of fishing gear, where/how gear immobilized animal, associated injury (where directly or indirectly caused by initial entanglement), response of individual
P8a	Gear wrapped and constricting any body part or likely to become constricting as the animal moves or grows	SI	
P8b	Gear wrapped loosely on any body part	Case specific	Type and amount of fishing gear, animal body size relative to gear (species, age), effect on movement, species sensitivity
P9	Body trauma ⁹ not covered by any other criteria	Case specific	Location of trauma on body, depth (superficial or to the bone, penetrating muscle or organs) length of laceration(s), number of lacerations, cleanliness (compression vs. tearing), amount and duration of blood loss, risk of infection or disease transmission (e.g., dog bites)
P10	Visible fracture(s), excluding broken appendages (see criterion P13 for broken appendages)	SI	
P11	Vertebral transection or fully severed flipper(s)	SI	
P12	Body cavity penetration ¹⁰ by foreign object or body cavity exposure	SI	
P13	Partially severed or fractured flipper(s)	Case specific	Cleanliness (clean cut vs. tear), nature of injury causing the loss, extent of fin or flipper loss, opened or closed fracture, dislocation, amount/duration of blood loss
P14	Dependent animal (i.e., pup, juvenile) released alone post-interaction or dependent animal left with a seriously injured or dead mother	SI	
P15	Observed or reported collision with vessel	Case specific	Speed of vessel, size of vessel, hull shape, part of vessel to strike the animal (e.g., propeller, hull), size of animal compared to size of vessel, location of strike on animal’s body, extent and location of wound(s) to animal

¹ For the purposes of this table, pinnipeds include all pinniped species except walrus.

²This table includes only those criteria determined to be serious injuries or case specific based on expert opinion at the 2007 Workshop (Andersen et al., 2008) and by pinniped experts on the NMFS Determination Staff working group. For the purposes of streamlining the information for the reader, criteria determined to be non-serious injuries are not included in this table.

³SI = serious injury.

⁴For the purposes of this table, gear is defined as any portion of fishing gear excluding the hook, which is considered separately. Lures are considered gear. Gear also generally refers to any type of debris entangling or attached to the animal.

⁵Case specific scenarios could be a serious or non-serious injury, but either 1) there insufficient information about the impact of a particular injury, or 2) additional factors must be considered on a case-by-case basis to determine the severity.

⁶For the purposes of this table, “potential” as it relates to criterion P5d indicates that the trailing gear IS NOT capable of leading to any of the situations listed.

⁷NSI = non-serious injury.

⁸For the purposes of this table, “potential” as it relates to criterion P6 indicates that the trailing gear IS capable of leading to any of the situations listed.

⁹For the purposes of this table, “trauma” is defined as a wound or bodily harm caused by an extrinsic agent. Blunt trauma is an injury (abrasion, laceration, contusion, or skeletal fracture) produced by a blunt object striking the body or impact of the body against a blunt object or surface. Sharp force trauma is an injury caused by a sharp or pointed object or a bullet from a gunshot creating a penetrating (stab, chop, or incision) wound. Laceration is defined as a ragged incision or a tearing of the skin. Lacerations are caused by blunt trauma that results in stretching, tearing, crushing, shearing, or avulsion of the tissue.

¹⁰For the purposes of this table, “penetration” is defined as a wound occurring when a foreign object punctures the body, such as a bullet from a gunshot. Penetrating wounds can be characterized as 1 of 3 types: stab (small external wound that is greater in length into the body than is apparent on the skin surface), incised (clean cuts into the skin which are longer on the skin surface than they are deep), or chop wounds (incised wounds that penetrate deep to the bone, leaving a groove or cut in the bone)

REFERENCES CITED

- Andersen MS, Forney KA, Cole TVN, Eagle T, Angliss R, Long K, Barre L, Van Atta L, Borggaard D, Rowles T, et al. 2008. Differentiating serious and non-serious injury of marine mammals: Report of the serious injury technical workshop, 10-13 September 2007, Seattle, Washington. US Dept Commer Northeast Fish Sci Cent Tech Memo 39. 108 p. Available from: <https://repository.library.noaa.gov/view/noaa/4389>
- Angliss RP, DeMaster DP. 1998. Differentiating serious and non-serious injury of marine mammals taken incidental to commercial fishing operations: Report of the Serious Injury Workshop, 1-2 April 1997, Silver Spring, Maryland. US Dept Commer Northeast Fish Sci Cent Tech Memo 13. 53 p. Available from: <https://repository.library.noaa.gov/view/noaa/4390>
- Hayes SA, Josephson E, Maze-Foley K and Rosel PE, eds. 2020. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2019. NOAA Tech Memo NMFS NE-264; 479 p.
- Josephson E, Wenzel F, Lyssikatos MC. 2019. Serious injury determinations for small cetaceans and pinnipeds caught in commercial fisheries off the northeast U.S. coast, 201–2018. Northeast Fish Sci Cent Ref Doc 19-17. 38 p. Available from: <https://repository.library.noaa.gov/view/noaa/22426>.
- Maze-Foley, K., B.L. Byrd, S.C. Horstman and J.R. Powell. 2019. Analysis of stranding data to support estimates of mortality and serious injury in common bottlenose dolphin (*Tursiops truncatus truncatus*) stock assessments for the Atlantic Ocean and Gulf of Mexico. Northeast Fish Sci Cent Tech Memo742. 50 p. Available from: <https://repository.library.noaa.gov/view/noaa/23151>
- National Policy for Distinguishing Serious from Non- Serious Injuries of Marine Mammals, 77 F.R. Sect. 3233 (2012). Accessible at: https://www.avma.org/sites/default/files/resources/noaa_serious_injury_policy.pdf
- Waring GT, Josephson E, Maze-Foley K, Rosel PE, editors. 2016. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments – 2016. NOAA Tech. Memo. NMFS-NE-238. 501 p.

Procedures for Issuing Manuscripts in the Northeast Fisheries Science Center Reference Document (CRD) and the Technical Memorandum (TM) Series

The mission of NOAA's National Marine Fisheries Service (NMFS) is "stewardship of the nation's ocean resources and their habitat." As the research arm of the NMFS's Greater Atlantic Region, the Northeast Fisheries Science Center (NEFSC) supports the NMFS's mission by "conducting ecosystem-based research and assessments of living marine resources, with a focus on the Northeast Shelf, to promote the recovery and long-term sustainability of these resources and to generate social and economic opportunities and benefits from their use." Results of NEFSC research are largely reported in primary scientific media (e.g., anonymously peer-reviewed scientific journals). However, to assist itself in providing data, information, and advice to its constituents, the NEFSC occasionally releases its results in its own series.

NOAA Technical Memorandum NMFS-NE – This series is issued irregularly. The series typically includes: data reports of long-term field or lab studies of important species or habitats; synthesis reports for important species or habitats; annual reports of overall assessment or monitoring programs; manuals describing program-wide surveying or experimental techniques; literature surveys of important species or habitat topics; proceedings and collected papers of scientific meetings; and indexed and/or annotated bibliographies. All issues receive internal scientific review, and most issues receive technical and copy editing.

Northeast Fisheries Science Center Reference Document – This series is issued irregularly. The series typically includes: data reports on field and lab studies; progress reports on experiments, monitoring, and assessments; background papers for, collected abstracts of, and/or summary reports of scientific meetings; and simple bibliographies. Issues receive internal scientific review, and most issues receive copy editing.

CLEARANCE

All manuscripts submitted for issuance as CRDs must have cleared the NEFSC's manuscript/abstract/webpage review process. If your manuscript includes material from another work which has been copyrighted, you will need to work with the NEFSC's Editorial Office to arrange for permission to use that material by securing release signatures on the "NEFSC Use-of-Copyrighted-Work Permission Form."

For more information, NEFSC authors should see the NEFSC's online publication policy manual, "Manuscript/Abstract/Webpage Preparation, Review, & Dissemination: NEFSC Author's Guide to Policy, Process, and Procedure."

STYLE

The CRD series is obligated to conform with the style contained in the current edition of the United States Government Printing Office Style Manual; however, that style manual is silent on many

aspects of scientific manuscripts. The CRD series relies more on the CSE Style Manual. Manuscripts should be prepared to conform with both of these style manuals.

The CRD series uses the Integrated Taxonomic Information System, the American Fisheries Society's guides, and the Society for Marine Mammalogy's guide for verifying scientific species names.

For in-text citations, use the name-date system. A special effort should be made to ensure all necessary bibliographic information is included in the list of references cited. Personal communications must include the date, full name, and full mailing address of the contact.

PREPARATION

Once your document has cleared the review process, the Editorial Office will contact you with publication needs—for example, revised text (if necessary) and separate digital figures and tables if they are embedded in the document. Materials may be submitted to the Editorial Office as email attachments or intranet downloads. Text files should be in Microsoft Word, tables may be in Word or Excel, and graphics files may be in a variety of formats (JPG, GIF, Excel, PowerPoint, etc.).

PRODUCTION AND DISTRIBUTION

The Editorial Office will perform a copy edit of the document and may request further revisions. The Editorial Office will develop the inside and outside front covers, the inside and outside back covers, and the title and bibliographic control pages of the document.

Once the CRD is ready, the Editorial Office will contact you to review it and submit corrections or changes before the document is posted online. A number of organizations and individuals in the Northeast Region will be notified by e-mail of the availability of the document online.