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by Frederick Wenzel[1], Elizabeth Josephson[2], Marjorie C. Lyssikatos[1]

[1]NOAA Fisheries, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543
[2]Integrated Statistics,16 Sumner Street, Woods Hole, MA 02543

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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). A serious injury is defined as an injury that is more likely than not to result in mortality. 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 nonserious injuries of marine mammals (http://www.nmfs.noaa.gov/pr/pdfs/serious_injury_procedure.pdf). A major goal of the new guidelines were to establish national consistency and transparency in SI determinations. To implement the new guidelines, Science Center SI determination (SID) staff from each region review all documented marine mammal injury events on an annual basis. For the initial year of implementation, the records for 2007-2011 were evaluated (Waring et al. 2014; Cole and Henry 2013). For small cetaceans and pinniped injury determinations in the Northeast Region, fisheries observer (OBS) and At Sea Monitor (ASM) records were reviewed for incidentally-caught animals that were released alive. Observer comments on the condition of released animals and any associated photographs were compared to specific injury categories described in the new guidelines procedure manual, and each event was assigned an injury determination. Once completed, the Northeast Fisheries Science Center (NEFSC) SI small cetacean and pinniped determination table was independently reviewed by the Southwest Fisheries Science Center's (SWFSC) SID staff, the Greater Atlantic Regional Fisheries Office (GARFO), and the Atlantic Scientific Review Group (SRG) before the SI determinations were finalized.

METHODS

Electronic records of all small cetacean and pinniped bycatch that were coded as "alive" or "condition unknown" for 2014 were extracted from the Northeast Fisheries Observer Program (NEFOP) database. These records included OBS/ASM notes that provided information on entanglement characteristics (e.g., animal in cod-end), crew handling (e.g., rope tied to keel and crane, 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 aforementioned SI guidance document by 2 marine mammal researchers in the NEFSC Protected Species Branch. The 2 evaluators compared their determinations, and all differences were discussed to obtain agreement. All observed interactions in 2014 were tabulated, and final injury determinations and mortality events were used to estimate the proportion of observed SI animals relative to the other observed determinations (e.g., uninjured [UI], nonserious injury [NSI], and dead) by gear type and species. 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 The 2015 SAR includes serious injury determinations 2009-2013 (Waring et al. 2015). All otter trawls, bottom trawls (OTB), and midwater trawls (OTM) with observed takes of decomposed marine mammals were excluded from the proportion analysis. In trawl

fisheries, tow times are generally too short for decomposition to take place, so when a decomposed animal comes up in the net, death is presumed to have preceded the interaction. All decomposed marine mammals observed in sink gillnets (SGN) were included in the proportion analysis because soak durations for gillnet gear can be long enough to produce significant decomposition. Species codes and gear codes used in this report are contained in Tables 1 and 2 respectively. The statistical area designations are presented in Figure 1. The determination criteria for small cetaceans (S) and pinnipeds (P) are presented in the Appendix.

RESULTS AND DISCUSSION

Small Cetaceans

During 2014, NEFOP records of 1 Atlantic white-sided dolphin (*Lagenorhynchus acutus*), 4 common dolphins (*Delphinus delphis delphis*), 1 pilot whale (*Globicephala sp*.), 1 harbor porpoise (*Phocoena phocoena*), one Risso's dolphin (*Grampus griseus*), and 1 dolphin of unknown species were reviewed (Table 3). The condition code for these above cetaceans was recorded as "alive" or "unknown" (Tables 3-5).

In March 2014, 1 Atlantic white-sided dolphin was observed alive during haul back of a trawl. The dolphin was loosely caught in the mouth of the net, near bridles and head rope, with its head facing the mouth of net and body parallel to the net. It wiggled its body, not really thrashing, and made no noise. The observer saw it for 5-10 seconds before the cod end opened and the catch was released. No photos were taken. *Designated as cannot be determined (CBD)*.

In November 2014, a live common dolphin was observed in a trawl fishery. The dolphin was rolling in the net belly, with its pectoral flipper and fluke sticking out of meshes. The cod end was detached to release on deck. The animal was observed on the net reel but was not brought over the net reel. The crew saw the animal moving in the net, and the observer saw some movement of the fluke, but it was not thrashing. The observer only saw the fluke well and some of the left side. No sounds were heard. No wounds, marks, or bleeding were seen. The animal was out of the water less than 5 minutes and then was pushed down the stern ramp to release. The observer could not see the animal after release. *Designated as serious injury*.

In July 2014, 1 common dolphin fell out of the cod end when catch was dumped on deck. Signs of breathing (slow, 5-6 breaths) were noticed while the animal was on deck. Slow eye movement was seen but no other movements. The crew pushed it off the stern ramp. The dolphin took a minute to right itself once in the water then slowly swam away, gaining speed with distance. *Designated as serious injury*.

In September 2014, a gillnet trip with an At-Sea Monitor (ASM) reported a take of 1 live common dolphin. The captain saw a dolphin which appeared tangled by "a flipper" and then popped out as the net was brought out of water. The ASM was alerted to the incident, tried to get a picture of it escaping, but did not get to that side of boat in time. Captain commented that the dolphin swam away. No blood was seen in water. A pod of common dolphins was seen in the area of the net when it was set, 30 minutes prior. No photos were taken. *Designated as CBD*.

In February 2014, an otter trawl captured a common dolphin. The animal was dumped with catch from the cod end and had rope from net loosely caught on its dorsal fin. The animal did not fall from any height to deck and landed on the catch. It was slowly moving its fluke about 3-4 inches and its jaw, as if it were trying to breathe through its mouth. In the photo the animal appears to have a dark, approximately 1 inch wide mark around mid-mouth that the observer did

not note. No other wounds, marks, or bleeding were seen. The animal was on deck about 1 minute and then dragged off deck by its fluke by the crew. The animal was released down the stern ramp with no gear left on it. About 15-20 seconds after its release, the dolphin was seen swimming slowly near surface and stayed on the surface the whole time, although the observer could not see well, as it was dark and the boat was steaming away. *Designated as serious injury*.

In May 2014, 1 Risso's dolphin was observed in a trawl with its tail tangled in the cod end trip line. The animal, which was initially described by the crew as a "marine mammal", freed itself after a couple minutes and swam away without noticeable injuries. The animal freed itself before the crew could cut line. The crew described the animal as a pilot whale, but black and white. A Risso's dolphin was sighted later in trip, and the crew confirmed it was same species as the bycatch interaction. *Designated as CBD*.

In October 2014, an ASM aboard a gillnet trip briefly saw only the head of a harbor porpoise It appeared to be dead, with no meshes seen wrapped around head and no movement. *Designated as dead.*

In November, 2014 a trawl fishery reported a pilot whale take that was sideways in the belly of the net. The pilot whale was pinned onto the net reel for about 10 seconds. The crew cut the gear to get the animal out and released it while the cod end was still in the water. The observer only saw the left side, not the right. No wounds, marks, or bleeding were seen. The observer saw the mouth opening and closing, but no other movements were seen. The animal was out of water for about 20 seconds. The animal was seen swimming away from boat with a pod that followed the boat for about 5 mins before disappearing. No photos were taken. *Designated as Serious Injury.*

In October 2014, an unidentified dolphin was observed entangled in net, hanging loosely in the net bag. Photos were inconclusive. *Designated as CBD.*

Tables 4 and 5 also include summaries of dead and decomposed bycaught marine mammals recorded by NEFOP observers. In 2014, there were 3 offshore bottlenose dolphins (*Tursiops truncatus*), 38 common dolphins, 2 harbor porpoises, 7 pilot whales, 3 Risso's dolphins, and 4 white-sided dolphins reported as dead in bottom otter trawl gear. In sink gillnet gear there were 11 common dolphins, 29 harbor porpoises, and 2 white-sided dolphins recorded as dead. Four pilot whales were reported as dead in midwater trawl gear.

Pinnipeds

Seals are the only pinnipeds normally found in waters off the northeast US coast. In June 2014, ASM monitors recorded the condition of 1 unidentified seal taken in sink gillnet gear as "alive" (Table 3). The seal fell out of the net while coming onboard, and the incidental take log reads, "Pretty sure it was a gray seal." There were 4 additional dead gray seals (*Halichoerus grypus grypus*) observed on this trip. There were no comments in the monitor's logbook suggesting how or why the seal was reported as alive. *Designated as dead gray seal* (Tables 3-5).

One live harbor seal (*Phoca vitulina concolor*) was observed in the trawl fishery in January 2014. Observers noted that the seal swam into net while it was still in the water during haul back and was trapped in the cod end of the net for about 10 minutes. The seal was not caught in any meshes, just entrapped by net. The net was emptied on deck, not from any height, and the seal climbed out and moved quickly down trawl ramp. The seal was on deck for less than 15 seconds. While on deck, the seal moved around with no odd behavior or injuries seen. The observer was able to see the entire body and found no wounds, marks, or bleeding. *Designated as NSI* (Tables 3-5).

Observers recorded 2 gray seals taken during September 2014 in Gulf of Maine Atlantic herring (*Clupea harengus*) purse seine sets as alive. The animals were photographed swimming within the catch; once the float line was low enough the seals slipped right over the float line and swam away. *Designated as NSI* (Tables 3-5).

Tables 4 and 5 also include summaries of dead and decomposed bycaught marine mammals recorded by NEFOP observers. In 2014, there were 6 gray seals and 2 harbor seals reported as dead in bottom otter trawl gear. In sink gillnet gear there were 160 gray seals, 60 harbor seals, and 10 harp seals (*Pagophilus groenlandicus*) recorded as dead. One harbor seal was reported as dead in midwater trawl gear.

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

Code	Common Name	Scientific Name
BODO	Coastal Common Bottlenose Dolphin (Northern North Carolina Estuarine or Northern Migratory Stock)	*Tursiops truncatus*
CODO	Short-beaked Common Dolphin	*Delphinus delphis delphis*
UNPW	Long-finned or Short finned Pilot Whale	*Globicephala spp.*
UNDO	Unidentified Dolphin	
HAPO	Harbor porpoise	*Phocoena phocoena*
RISO	Risso's Dolphin	*Grampus griseus*
WSDO	Atlantic White Sided dolphin	*Lagenorhynchus acutus*
MIWH	Minke whale	*Balaenoptera acutorostrata*
GRSE	Gray Seal	*Halichoerus grypus grypus*
HASE	Harbor Seal	*Phoca vitulina concolor*
HPSE	Harp Seal	*Pagophilus groenlandicus*
UNSE	Unidentified Seal	

Table 2. Northeast region commercial fishery gear descriptions and codes used to query data on observed fishery interactions.

Gear Abbreviation	Gear description and Northeast region gear codes
OTB	Otter trawl bottom (bottom trawl, fish = 050, twin trawl = 053, Rhule trawl = 054, and haddock separator = 057)
OTM	Midwater trawls (single = 370 and paired = 170)
PSH	Purse seine = 121
SGN	Sink gillnet (anchored floating = 105, drift floating = 116, drift-sink = 117, and anchored sink, fixed = 100)

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, CBD = cannot be determined) for the year 2014. Determinations are based on observer notes and small cetacean and pinniped criteria in the National Marine Fisheries Service Determination Directive (NMFS 2012). Gear codes are listed in Table 2, statistical areas are shown in Figure 1, and species are shown in Table 1.

GEAR Code	Statis-tical Area	Take Date	Species Code	Recorded Animal Condition	Revised Animal Condition1	Deter-mination	NMFS 2014 SI Deter-mination Directive	Comments regarding determination
050	616	Mar. 2014	WSDO	alive		CBD		No additional info available.
050	539	Nov. 2014	CODO	alive		SI	S4	Animal on vessel deck.
050	537	July 2014	CODO	alive		SI	S4	Animal on vessel deck.
050	521	Feb. 2014	CODO	alive		SI	S4	Animal on vessel deck.
050	513	May 2014	RIDO	08		CBD		08= Observed alive, seen by captain and/or crew.
050	622	Nov. 2014	UNPW	alive		SI	S4	Animal on vessel deck.
050	514	Jan. 2014	HASE	alive		NSI		Seal observed on deck < 15 secs.
050	615	Oct. 2014	UNDO	alive		CBD		Photos inconclusive.
100	521	Sept. 2014	CODO	08		CBD		08 = Observed by Captain and/or crew only
100	514	Oct. 2014	HAPO	unknown	dead	DEAD		Appeared to be dead.
100	521	June 2014	UNSE	unknown	dead	DEAD		Appeared to be dead
121	512	Sept. 2014	GRSE	alive		NSI		Released alive from purse seine
121	512	Sept. 2014	GRSE	alive		NSI		Released alive from purse seine

Table 4. Summary of 2014 animal conditions (D = dead; DC = decomposed carcass; SI = serious injury; NSI = nonserious injury; UI = uninjured; CBD = could not be determined) by gear type, species, and year. Gear codes are listed in Table 2.

		Dead		Alive			
Gear Type	**Common Name**	**D (1)**	**DC (2)**	**SI**	**NSI**	**UI**	**CBD**
Otter Trawl Bottom	Bottlenose Dolphin (*Tursiops truncatus*)	3					
	Common Dolphin (*Delphinus delphis*)	38		3			
	Gray Seal (*Halichoerus grypus grypus*)	5	1				
	Harbor porpoise (*Phocoena phocoena*)	1	1				
	Harbor Seal (*Phoca vitulina concolor*)	2			1		
	Pilot Whale (*Globicephala sp.)*	5	2	1			
	Risso's Dolphin (*Grampus griseus*)	2	1				1
	White-sided Dolphin (*Lagenorhynchus acutus*)	3	1				1
Sink Gill Net	Common Dolphin (*Delphinus delphis*)	6	5				1
	Gray Seal (*Halichoerus grypus grypus*)	155	5				
	Harbor porpoise (*Phocoena phocoena*)	27	2				
	Harbor Seal (*Phoca vitulina concolor*)	53	7				
	Harp Seal (*Pagophilus groenlandicus*)	9	1				
	White-sided Dolphin (*Lagenorhynchus acutus*)	2					
Otter Trawl Midwater	Harbor Seal (*Phoca vitulina concolor*)	1					
	Pilot Whale (*Globicephala sp.)*	4					
Purse seine	Gray Seal (*Halichoerus grypus grypus*)				2		

[1] Animals included under the dead category include the following animal conditions reported by Northeast Fisheries Observer Program (NEFOP): 10 – dead, condition unknown; 11 – dead, fresh; 14 – dead, seen by captain/crew only.
[2] Animals included under the decomposed carcass category include the following animal conditions reported by NEFOP: 12 – dead, moderately decomposed; 13 – dead, severely decomposed.

Table 5. Animal determination frequencies and relative proportions by gear type and species in 2014: Gear types: OTB=bottom trawls; SGN=gillnets; OTM=midwater trawls; PSH=purse seines. Species: bottlenose dolphin [*Tursiops truncatus*]; common dolphin [*Delphinus delphis*]; gray seal [*Halichoerus grypus*]; harbor porpoise [*Phocoena phocoena*]; harbor seal [*Phoca vitulina*]; pilot whale [*Globicephala* spp]; Risso's dolphin [*Grampus griseus*]; white-sided dolphin [*Lagenorhynchus acutus*]. Assignment codes: D=dead; D*= Excludes decomposed animals and includes CBD animals; D= Includes decomposed and CBD animals; SI=serious injury; NSI=non-serious injury; UI=uninjured.**

Gear	Determination	Bottle-nose Dolphin		Common Dolphin		Gray Seal		Harbor Porpoise		Harbor Seal		Harp Seal		Pilot Whale		Risso's Dolphin		White-sided Dolphin	
OTB		Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop
	D*	3	1.00	38	0.93	5	1.00	1	1.00	2	0.67	0	0.00	5	0.83	3	1.00	4	1.00
	SI	0	0.00	3	0.07	0	0.00	0	0.00	0	0.00	0	0.00	1	0.17	0	0.00	0	0.00
	NSI	0	0.00	0	0.00	0	0.00	0	0.00	1	0.33	0	0.00	0	0.00	0	0.00	0	0.00
	UI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	Total	3	1.00	41	1.00	5	1.00	1	1.00	3	1.00	0	0.00	6	1.00	3	1.00	4	1.00
SGN		Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop
	D**	0	0.00	12	1.00	160	1.00	29	1.00	60	1.00	9	1.00	0	0.00	0	0.00	2	1.00
	SI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	NSI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	UI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	Total	0	0.00	12	1.00	160	1.00	29	1.00	60	1.00	9	1.00	0	0.00	0	0.00	2	1.00
OTM		Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop
	D*	0	0.00	0	0.00	0	0.00	0	0.00	1	1.00	0	0.00	4	1.00	0	0.00	0	0.00
	SI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	NSI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	UI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	Total	0	0.00	0	0.00	0	0.00	0	0.00	1	1.00	0	0.00	4	1.00	0	0.00	0	0.00
PSH		Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop	Freq	Prop
	D*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	SI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	NSI	0	0.00	0	0.00	2	1.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	UI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	Total	0	0.00	0	0.00	2	1.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

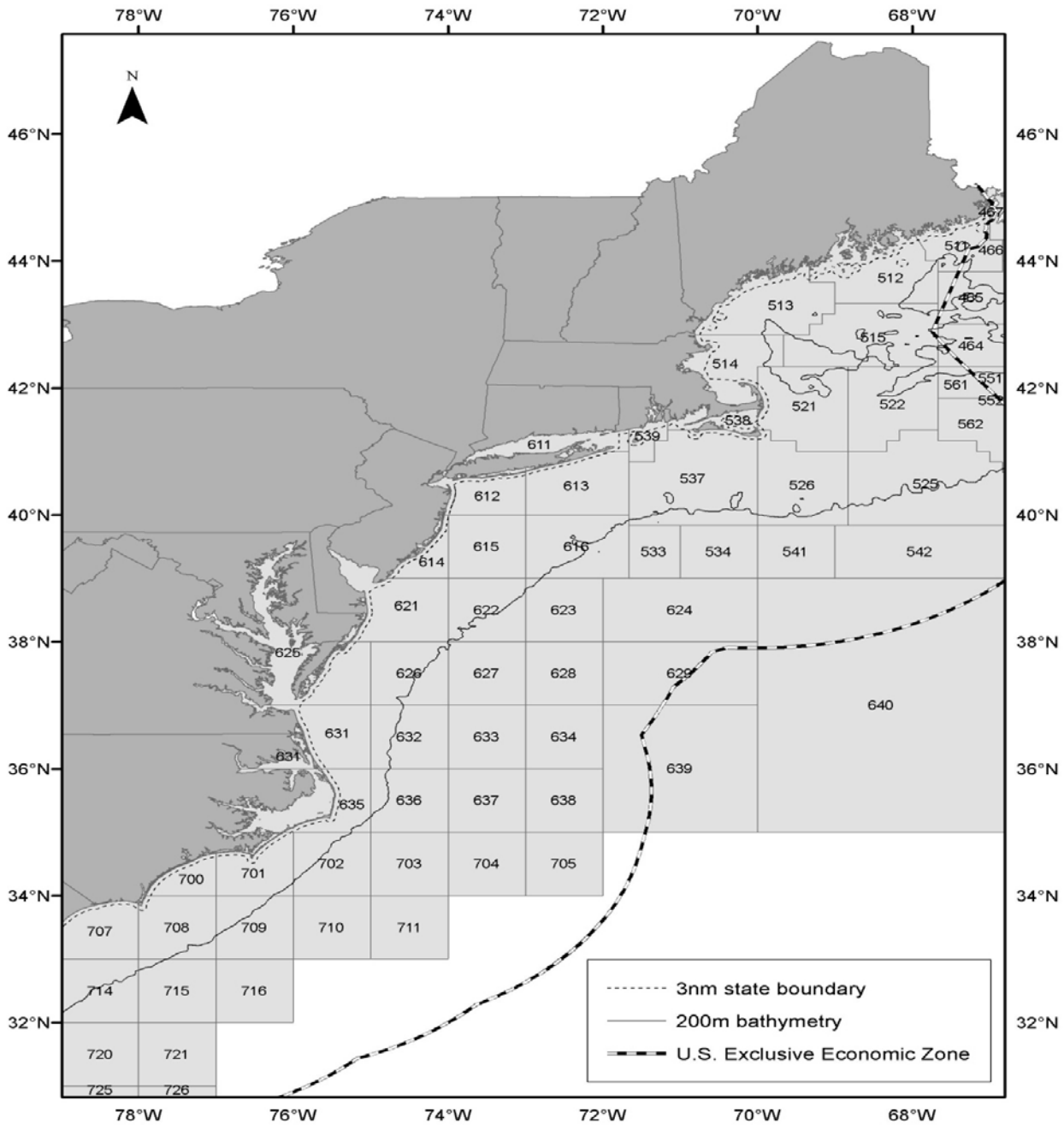

Figure 1. US Northwest Atlantic Fishery statistical areas.

Appendix: Tables 2 and 3 from NMFS Process for Distinguishing Serious from Nonserious Injury of Marine Mammals (NMFS 2012).

TABLE 2: Summary of Small Cetacean[1] Injury Categories and Criteria
http://www.nmfs.noaa.gov/pr/pdfs/serious_injury_procedure.pdf

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. 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) *
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 a 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 pulls 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
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
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 = 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 one of three 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).

* Factors listed in the far right column of Table 2 are unique to the associated injury type. In addition to those listed in this column, the factors that should be considered, if available, when reviewing all case specific injury events in Table 2 include, but are not limited to:

- Species
- Age or age class (e.g., calf, juvenile, adult)
- Sex
- Size of animal
- Overall health (e.g., nutritional status, body condition, pre-existing disease state, pre-existing injuries)
- Behavior during and/or after injury- causing interaction (e.g., dorsal arching, listlessness)
- Reproductive status (e.g., pregnant, lactating, has dependant calf)
- Natural history (e.g., indigenous, migratory)
- Location of injury (e.g., mouth, head, body, fin, tail, internal)
- Size of injury
- Duration of injury (e.g., single event, repeated, chronic)
- Depth of injury (e.g., superficial or to the bone, penetrating muscle or organs)
- Cleanliness of injury (e.g., compression, tearing)
- Environmental condition (e.g., individuals out of their normal habitat, climate stressors)
- Social stressors (e.g., social structure of species, separation of social individuals from the group, cow/calf separation)
- Cumulative effects of repeated exposures
- Compounding effects of multiple injuries obtained during a single event
- Availability of data on multiple sequential events involving the same individual over time
- Susceptibility of the species to capture myopathy (spinner dolphins and porpoises notoriously sensitive; bottlenose dolphins robust; many others fall in between, with some unknown)
- Ability of rehabilitated animal to be released
- Relative effect of blood loss on different species

In addition to those factors listed above, the factors that apply to all fishery-interaction related case specific injuries include, but are not limited to:

- Entanglement type (e.g., hooked, anchored, entrapment)
- Amount and size of gear (e.g., size, length and number of branches of line; number of buoys, traps or anchors; volume of netting)
- Entanglement constriction (e.g., tight, loose, multiple wraps)
- Habitat where animal is located (e.g., an animal with trailing gear areas of dense gear or an area with vegetation is more likely to risk snagging the gear and becoming anchored)
- Entanglement duration
- Existence, type and amount of any trailing gear
- Method of handling the animal during disentanglement

TABLE 3: Summary of Pinniped[1] Injury 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 a 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 pulls 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]	
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.

[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 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.

[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 = 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.

[6] For 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.

[7] NSI = non-serious injury.

[8] For 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.

[9] 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 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.

[10] For 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 one of three 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).

* Factors listed in the far right column of Table 3 are unique to the associated injury type. In addition to those listed in this column, the factors that should be considered, if available, when reviewing all case specific injury events in Table 3 include, but are not limited to:

- Species
- Age or age class (e.g., calf, juvenile, adult)
- Sex
- Size of animal
- Overall health (e.g., nutritional status, body condition, pre-existing disease state, pre-existing injuries)
- Behavior during and/or after injury- causing interaction (e.g., listlessness)
- Reproductive status (e.g., pregnant, lactating, has dependant pup)
- Natural history (e.g., small home range, large home range)
- Location of injury (e.g., mouth, head, body, flipper/fin, internal)
- Size of injury
- Duration of injury (e.g., single event, repeated, chronic)
- Depth of injury (e.g., superficial or to the bone, penetrating muscle or organs)
- Cleanliness of injury (e.g., compression, tearing)
- Environmental condition (e.g., individuals out of their normal habitat, environmental stressors)
- Social stressors (e.g., social structure of species, separation of social individuals from the group, mother/pup separation)
- Cumulative effects of repeated exposures
- Compounding effects of multiple injuries obtained during a single event
- Availability of data on multiple sequential events involving the same individual over time
- Susceptibility of the species to capture myopathy (some sensitive, others robust, some unknown)
- Ability of rehabilitated animal to be released
- Relative effect of blood loss on different species

In addition to those factors listed above, the factors that apply to all fishery or marine-debris interaction related case specific injuries include, but are not limited to:

- Entanglement type (e.g., hooked, anchored, entrapment)
- Amount and size of gear(e.g., size, length and number of lines; number of buoys, traps or anchors; volume of netting; material of gear)
- Method of handling the animal during disentanglement
- Entanglement constriction (e.g., tight, loose, multiple wraps)
- Habitat where animal is located (e.g., an animal with trailing gear in areas of dense gear or an area with vegetation or on shore is more likely to risk snagging the gear and becoming anchored)
- Entanglement duration
- Existence, type and amount of any trailing gear

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