

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. Any injury leading to apparent significant health decline (e.g., skin discoloration, fat loss) is a serious injury. | | | |
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| 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 |

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.

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| 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 | |

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).

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

* 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:

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

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:

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| - Entanglement type (e.g., hooked, anchored, entrapment) | - 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) |
| - 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 duration |
| - Entanglement constriction (e.g., tight, loose, multiple wraps) | - Existence, type and amount of any trailing gear |
| | - Method of handling the animal during disentanglement |

cases of dolphins with propeller lacerations to the head were determined to be serious, and 40 percent were non-serious, then all of the CBD cases for bottlenose dolphins observed with that type of injury would be designated as serious. In cases where data on assignable injury events are limited in one region or where sample sizes are small, data can be pooled across regions to provide a more robust sample set on which to base the severity assignment of a CBD injury event. Statistical evaluations, such as the binomial probability tests applied to large whale data above, are encouraged when appropriate to aid in evaluating whether an injury is more likely to be serious or non-serious based on the available data. If sample sizes of similar assignable cases are insufficient to determine whether an injury is more likely to be serious or non-serious, prorating can be used, as described in Section VII-A for large whales (see also Appendix I). All CBD cases that are assigned or prorated based on previous assignable injury events should be indicated as such in the serious injury determination reports and SARs.

D. Assessing and Documenting the Injury Status of Small Cetaceans after Successful Post-Interaction Mitigation Efforts

Small cetacean injuries that are successfully mitigated may change an event's assignment from a category with a serious injury determination to a non-serious determination. Events that would have been serious injuries prior to mitigation should be tallied separately as serious injuries. These events are not counted against PBR in the SAR, but are included in the recorded takes for the LOF. See section VI for more information on this process.

E. Small Cetacean Injury Categories and Criteria

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)”- *serious injury*

Small cetacean experts on the NMFS Determination Staff Working Group included this criterion to account for animals that are resighted (which is rare for most small cetacean species) at some time after an injury event exhibiting marked signs of health decline as a result of the injury. In those cases, the initial injury is a serious injury because it resulted in the animal's health decline.

S2: “*Ingested gear or hook(s)*”- *serious injury*

The ingestion of gear or hooks by a marine mammal is cited as a serious injury in multiple publications, including Andersen *et al.* (2008), Wells *et al.* (2008), Carretta *et al.* (2004), and Angliss and DeMaster (1998). In addition, small cetacean experts participating in the 2007 Serious Injury Technical Workshop (Workshop) indicated that the ingestion of gear by small cetaceans is a serious injury. Data from bottlenose dolphins in Florida show that fishing hooks (including partial hooks) embedded in the throat, goosbeak, or esophagus, or line wrapped around the goosbeak, generally lead to death, although there is some chance of survival if the hook(s) does not become embedded (Wells *et al.*, 2008). In addition, death from gear ingestion was not immediate, with most of the retrieved carcasses being emaciated (Wells *et al.*, 2008).

S3: “*Visible blood loss*”- *case specific*

Small cetacean experts participating in the 2007 Workshop indicated that an injury with visible blood loss is case specific. Blood loss indicates that the animal is “injured” (50 Code of Federal Regulations 229.2), and observation may provide additional information to determine whether the bleeding injury is serious or non-serious. Injuries with persistent bleeding would be considered a serious injury, whereas injuries where the bleeding stops relatively quickly may not be considered a serious injury. Additional factors about the injury need to be considered before making a determination of severity (see Table 2), such as the amount of blood and the location of the bleeding injury.

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)*”- *serious injury*

Small cetacean experts participating in the 2007 Workshop indicated that a small cetacean brought on the vessel deck following an interaction is seriously injured because such handling causes substantial stress to the individual and subjects the individual to a high risk of later death due to capture myopathy or hidden injuries. NMFS-permitted marine mammal scientific research is not included in this criterion because the permit for the research requires a certain level of care be taken during the research not to harm the animal. In these cases, the animal is brought on and placed on the vessel in a controlled manner, causing no harm or a significantly lower level of injury than an animal brought on board in an uncontrolled manner (e.g., pulled on by fishing gear).

S5a: “*Hook(s) in head (excluding criterion S5b), regardless of the presence of gear*”- *serious injury*

A small cetacean hooked in the head (near the eyes) is considered seriously injured by Angliss and DeMaster (1998). Small cetacean experts participating in the 2007 Workshop agreed with Angliss and DeMaster (1998) that a small cetacean with a hook in the head, including the eyes, blowhole, and mouth, is seriously injured because of the potential for ingesting attached gear, impairing feeding, breathing, or sight, or acting as a conduit for infection.

S5b: “*Hook(s) confirmed in lip only, external tissue outside of teeth, no trailing gear*”- *case specific*

Small cetacean experts participating in the 2007 Workshop indicated that a small cetacean with a confirmed hook in the lip only, including only external tissue outside of the teeth, is case specific. A hook in the lip can pull out and could be considered non-serious unless there are other circumstances that would increase the severity, such as impairing the ability to feed, prolonged struggle while hooked that could lead to capture myopathy, or the presence of other injuries. Additional factors about the injury and hooking event need to be considered before making a determination of severity (see Table 2).

S5c: *“Hook(s) in any body part, but hook(s) is removed or pulls out” - case specific*

Small cetacean experts on the NMFS Determination Staff Working Group included this criterion to account for cases where an animal is hooked and the hook is removed naturally over time or by human intervention. This injury is case specific because the location of the hook and the manner in which it is removed (i.e., pulls out cleanly vs. roughly) impacts the severity of the injury. Additional factors about the injury need to be considered before making a determination of severity (see Table 2).

S5d: *“Hook(s) in appendage or body (excluding criterion S5a), without trailing gear or with trailing gear that does not have the potential 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*

Small cetacean experts participating in the 2007 Workshop indicated that a small cetacean hooked in an appendage or the body (excluding the head), without trailing gear or with trailing gear that does not have the potential to cause additional constricting wrapping, anchoring or ingestion, is case specific. Additional factors about the injury need to be considered before making a determination of severity (see Table 2).

S6: *“Gear attached to free-swimming animal with potential 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” - serious injury*

A small cetacean entangled with trailing gear is considered seriously injured by Angliss and DeMaster (1998). Small cetacean experts participating in the 2007 Workshop agreed with Angliss and DeMaster (1998) and further indicated that a small cetacean with attached gear that has the potential to entangle the animal is seriously injured because the gear may become constricting (S8a) and/or cause the animal to drown as a result of dragging gear for extended periods of time.

S7a: *“Anchored, immobilized, or entrapped and not freed” - serious injury*

Small cetacean experts participating in the 2007 Workshop indicated that an entanglement that immobilizes or significantly impairs the movement of a small cetacean is a serious injury because small cetaceans must generally eat every day and would be unable to do so if immobilized by an entanglement or entrapment. Also, a small cetacean may tire quickly as a result of its small body size, interfering with its ability to reach the surface to breathe, and it may be susceptible to capture myopathy as it struggles to free itself.

S7b: *“Anchored, immobilized, entangled, or entrapped before being freed without gear attached” - case specific*

Small cetacean experts participating in the 2007 Workshop indicated that a small cetacean released without gear attached following an entanglement or immobilization is case specific. Capture myopathy considerations suggest some of these animals may subsequently die because the health of the animal may be compromised to a greater extent the longer it is immobilized by an entanglement or entrapment. Also, small cetaceans may be unable to feed while entangled or entrapped and/or have increased difficulty reaching the surface. The longer the animal is immobilized, anchored, or

entrapped, the longer it may go without food or regular access to oxygen. Additional factors about the injury need to be considered before making a determination of severity (see Table 2).

S8a: *“Gear wrapped and constricting on any body part or is likely to become constricting as the animal moves or grows”- serious injury*

Small cetacean experts participating in the 2007 Workshop indicated that a small cetacean with constricting wraps of line around any body part, or line that is likely to become constricting as the animal grows or because of the animal's movement, is seriously injured. This is a serious injury because the constricting wraps of gear can cause lacerations, fin amputation, organ damage, or muscle damage, and interfere with mobility, feeding, and breathing.

S8b: *“Gear wrapped and loose on any body part”- case specific*

Small cetacean experts on the NMFS Determination Staff Working Group included this criterion to distinguish cases where gear was constricting or had the potential to become constricting (criteria S6 and S8a) from gear that, while wrapped on the animal, is loose and unlikely to become constricting. This injury is case specific because gear that is loosely wrapped around a small cetacean can either work its way off the animal, never become constricting or accumulate drag (resulting in a non-serious injury), or become constricting (resulting in a serious injury, see criterion S8a). Therefore, additional factors about the injury need to be considered before making a determination of severity (see Table 2), such as the amount and size of the gear relative to the size of the animal.

S9: *“Body trauma not covered by any other criteria”- case specific*

Small cetacean expert participants and the 2007 Workshop included this criterion to incorporate general body trauma, including lacerations, that is not specified in any other criteria. Small cetacean experts indicated that body trauma was case specific because additional factors about the injury need to be considered before making a determination of severity (see Table 2), such as the location on the body (e.g., a laceration on the dorsal midline, including the peduncle, may be more serious than a laceration over the animal's ribcage; eye injuries and head trauma may be more serious than trauma to other body parts), the depth (e.g., a deep laceration or other trauma reaching the bone or penetrating muscle or organs is more serious than a superficial wound) and cleanliness of the wound.

S10: *“Visible fractures, excluding pectoral fins (see criterion S13d for pectoral fin fractures)”- serious injury*

Small cetacean experts participating in the 2007 Workshop indicated that a visible fracture is a serious injury. Fractures that are visible can include open fractures (i.e., when a broken bone punctures the skin and exposes the wound to the open air) and closed fractures (i.e., when a broken bone does not puncture the skin) and are usually severe enough to interfere with everyday activities necessary to small cetaceans' survival, such as mobility, feeding, and defense. Pectoral fins are covered separately in criterion S13d.

- S11: *“Vertebral transection, including fully severed flukes” - serious injury*
 Small cetacean experts participating in the 2007 Workshop indicated that an injury including vertebral transection is a serious injury because vertebral transection injuries are most commonly reported as mortalities, indicating the injury is often fatal.
- S12: *“Body cavity penetration by foreign object or body cavity exposure” - serious injury*
 Small cetacean experts participating in the 2007 Workshop indicated that body cavity penetration or exposure is a serious injury. Body cavity penetration or exposure can introduce bacteria into the vital organs and the internal cavity, which can lead to massive infection.
- S13a: *“Loss or disfigurement of dorsal fin” - case specific*
 Small cetacean experts participating in the 2007 Workshop indicated that the loss or disfigurement of the dorsal fin is case specific because there is evidence that small cetaceans can survive and reproduce without the dorsal fin (Wells *et al.*, 2008). Additional factors about the injury need to be considered before making a determination of severity (see Table 2), such as the nature of the injury causing the loss of the dorsal fin, which will affect the likelihood of survival. Cases of bottlenose dolphins in Florida involving major disfigurement or loss of significant dorsal fin or fluke tissue show that, on average, individuals survived a minimum of 8.7 years with these wounds (Wells *et al.*, 2008). However, these observations include information only on the survivors, and it is unknown what proportion of animals may die as a result of the loss of the dorsal fin (Wells *et al.*, 2008).
- S13b: *“Partially severed flukes, transecting midline” - serious injury*
 Small cetacean experts participating in the 2007 Workshop indicated that the partial severing of the flukes that transects the animal’s midline is a serious injury. A partial severing of the fluke that transects the animal’s midline has a high risk for severing major vessels (e.g., arteries, veins), resulting in more severe blood loss. Also, this injury crosses the caudal vertebral column and exposes bone and major vessels to infection.
- S13c: *“Partially severed flukes, not transecting midline” - case specific*
 Small cetacean experts participating in the 2007 Workshop indicated that the partial severing of the flukes that does not transect the animal’s midline is case specific. Additional factors about the injury need to be considered before making a determination of severity (see Table 2), such as the nature of the injury causing the partial severing, which will affect the likelihood of survival.
- S13d: *“Partially or completely severed or fractured pectoral fin(s)” - case specific*
 Small cetacean experts participating in the 2007 Workshop indicated that a partial severing of the pectoral fin(s) is case specific. Small cetacean experts on the NMFS Determination Staff Working Group included fractured pectoral fins in this criterion to distinguish fin fractures from other bone fractures (S10). Additional other factors about the injury need to be considered before making a determination of severity (see Table 2), such as the nature of the injury causing the severing of the fin(s) and the extent of fin(s)

loss (i.e., full or partial) or the extent of the fracture (i.e., opened or closed), which will affect the likelihood of survival.

S14: “*Social animal separated from group and/or released alone post-interaction*” - case specific (excluding criterion S15)

Angliss and DeMaster (1998) stated that entanglements that result in a small cetacean separated from its group should be considered seriously injured. Small cetacean experts participating in the 2007 Workshop agreed with Angliss and DeMaster (1998) that a small cetacean from a social species separated from its group is case specific. Additional factors about the interaction need to be considered before making a determination of severity (see Table 2), such as the social structure of the individual’s species and where the animal is released (e.g., likelihood of the animal locating its conspecifics). A social animal released alone may be subjected to additional stress and reduced survival (e.g., decreased foraging success, increased predation risk).

S15: “*Dependent animal (i.e., calf, juvenile) released alone post-interaction or dependent animal left with a seriously injured or dead mother*” - serious injury

Small cetacean experts participating in the 2007 Workshop indicated that a dependent (e.g., calf, juvenile) small cetacean separated from its group or mother (i.e., animal is unlikely to locate its group or mother on its own) is seriously injured because a dependant animal released alone would be subjected to significant additional stress and reduced survival.

S16: “*Observed or reported collision with a vessel*” - case specific

Injuries to small cetaceans as a result of a collision with a vessel are not always observed after the vessel strike; therefore, the injury to that individual cannot be assessed. However, many vessel strikes are observed and reported to NMFS without information pertaining to the resulting injury. For example, NMFS receives a report that a bottlenose dolphin was struck by a vessel X feet in length and traveling Y knots, with no information on the animal after the strike. In these cases, small cetacean experts participating in the 2007 Workshop indicated that the severity of an injury to a small cetacean from a collision with a vessel is case specific. Additional factors about the injury need to be considered before making a determination of severity (see Table 2), such as the size and speed of the vessel and the location of the injury. If injury information is available and provided to NMFS, the appropriate criteria from S1-S15 will be considered. For example, NMFS receives a report that a bottlenose dolphin was struck by a vessel X feet in length and traveling Y knots, and the animal swam away with head trauma. In this case, the determination staff would also apply criterion S9 to the injury event.