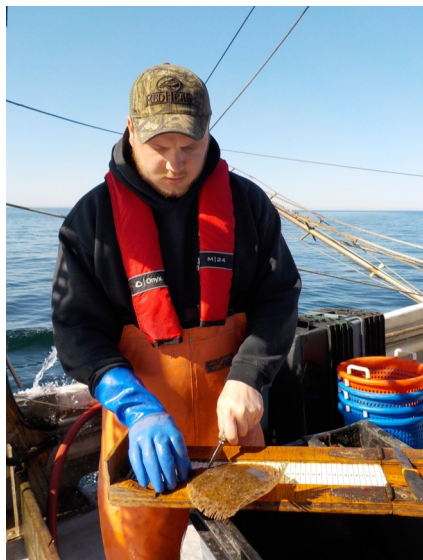




revised 05/01/2016

NORTHEAST FISHERIES SCIENCE CENTER FISHERIES SAMPLING BRANCH OBSERVER ON-DECK REFERENCE GUIDE 2016



U.S. Department of Commerce
NOAA Fisheries Service
National Marine Fisheries Service
Northeast Fisheries Science Center
Fisheries Sampling Branch
166 Water Street
Woods Hole, MA 02543

1. Collect all trip-level information
 - Vessel information (hull number, permit number, VTR or eVTR number, trip costs, etc.)
 - Trip dates & times (boarded, sailed, landed, disembarked)
2. Collect information for each gear
 - Specific type (gillnet type, trawl net type, hook types, dredge frame type, etc.)
 - Mesh sizes and other critical information
3. Collect information for each haul
 - Gear number used
 - Dates, times, locations
 - Environmental conditions (weather, wave height, etc.)
4. Record complete catch composition for required observed hauls
 - Record all IAL species and incidental takes
 - Account for all catch (kept and discard)
5. Collect actual weights or accurate estimates
 - Priority discards (target species, groundfish, other commercially important species)
 - Priority kept catch (target species, groundfish, other commercially important species)
6. Collect length frequencies (and samples on NEFOP and IFS trips)

NEFOP

ASM

IFS

Review the [FSB Observer Operations Manual](#) for detailed information about observing each trip type.

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This guide is intended to serve as a general at-sea sampling reference for all NEFSC fisheries observer sampling programs. It contains summaries and tables designed to let observers quickly determine the correct biological sampling protocols and methods while at sea, as well as suggested catch estimation strategies. This guide should be used in conjunction with the FSB Observer Operations Manual and Observer Data Entry Manual.

NEFOP

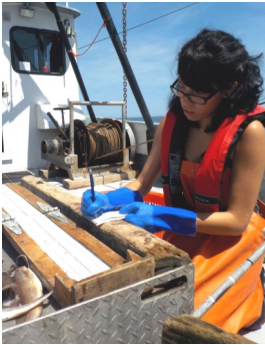
ASM

IFS

Use the colored boxes in the margin to determine if the page is relevant to the trip type you are observing:

NEFOP	Northeast Fisheries Observer Program
ASM	At-Sea Monitoring Program
IFS	Industry Funded Scallop Program

The National Marine Fisheries Service (NMFS) Northeast Fisheries Science Center (NEFSC) Fisheries Sampling Branch (FSB) collects, maintains, and distributes data for scientific and management purposes in the northwest Atlantic Ocean. FSB manages three separate but related observer programs: the Northeast Fisheries Observer Program (NEFOP), the Industry Funded Scallop (IFS) Observer Program, and the At-Sea Monitoring (ASM) Program.



NEFOP

ASM

IFS

Biological sampling is one of the most important functions of a fisheries observer. Information and samples collected by observers are often unobtainable by any other method. These data are used in scientific studies and can influence management regulations. It is therefore very important that observers have a thorough understanding of biological sampling principles and practices. Prior to deployment, especially in a new fishery, observers should review all biological sampling protocols and resolve any uncertainty with their supervisor or FSB staff.

Observed Haul: A haul for which weights are collected for all species, both kept and discarded. Discard information includes everything brought up in the gear: vertebrate and invertebrate animals, rocks, plants, and debris.

Unobserved Haul: A haul for which complete kept and discarded catch information cannot be fully collected. A haul may be unobserved due to weather, illness, etc. Only record kept catch on the Haul Log.

Exception: If a Discard Log is used, you should record as much discard information as possible on unobserved hauls.

NOTE: Record information for all individual animal and incidental take records during unobserved hauls.

Sampled Haul: A haul for which detailed biological information is collected, such as length measurements and age structures, from certain species or a portion of the catch. ASM trips: only length frequencies are collected.

Summary

Biological sampling involves collecting data on the species caught to aid in determining the effect of fishing effort on catch size and species distribution. These data are also useful in establishing length-weight relationships, aging, migration patterns, food habits, and other valuable biological information.

Biological sampling consists of the collection of the following information from both the kept and discarded catch:

- Actual weights
- Length frequencies
- Age structures
- Tissue and/or other samples, which may include special sampling requests

The instructions for each fishery specify the minimum frequency for biological sampling.

NEFOP

ASM

IFS

The tables and summaries included in this manual are designed to give you enough information to make decisions about which species to sample, and in what priority, on a per haul basis.

Sampling priorities are organized by fishery (gear type) and area, with species grouped into three lists: Priority 1 (highest), Priority 2 (medium), and Priority 3 (lowest). Species are listed alphabetically within each list. If a species is listed under Priority 1, it is the highest priority for both length frequency and age structures (if applicable, see [Biological Sampling Requirements by Species](#) on page 29), and for both kept and discarded fish of that species.

If a species holds multiple priority levels, the following notation will indicate the sub-category:

LF = Length Frequency

K = Kept

AS = Age Structure

D = Discard

Using the example table on the right, your highest priority would be length frequencies on kept and discarded alewife (no age sample requirement), length frequencies on kept and discarded witch flounder, and both length frequencies and age structures on kept and discarded haddock.

Your next priority would be age structures on kept witch flounder, length frequencies on kept and discarded yellowtail flounder, and length frequencies on the discarded barndoor skate (no age sample requirement).

Your lowest priority would be length frequencies on kept and discarded striped bass (no age sample requirement), age structures on discarded witch flounder, and age structures on kept and discarded yellowtail flounder.

Listings of “Skate, nk” and “Flounder, nk” indicate any species in that group not already listed.

EXAMPLE

Priority 1

Alewife

Flounder, Witch (LF)

Haddock

Priority 2

Flounder, Witch (AS K)

Flounder, Yellowtail (LF)

Skate, Barndoor (D)

Priority 3

Bass, Striped

Flounder, Witch (AS D)

Flounder, Yellowtail (AS)

NEFOP

ASM

IFS

On ASM trips, the following priority guidelines supersede those listed elsewhere in this manual:

1. Actual weights of discarded groundfish.
If actual weights are not possible, tally or basket count are next preferred methods .
2. Weights of all other discarded catch, using most accurate method possible.
3. Weights of all kept catch, using basket/tote counts (preferred) or captain’s estimate (less preferred).
Regardless of the method used, **kept or discard must be determined by the captain or crew**. Do not make these determinations yourself, even if you think you know the size limits.
4. Length frequencies of discarded groundfish.
5. Length frequencies of kept groundfish.
6. Length frequencies of other species (as listed in the priority tables).
7. While taking weights and length frequencies, photograph species for ID verification (see [Species Verification Program Requirements](#) on page 53).
8. If an incidental take occurs:
Follow the minimum sampling requirements for that species, and then resume focus on groundfish weights and length frequencies. A haul should not be unobserved in the ASM program because of an incidental take.
9. If an IAL species exists:
Photograph the animal for ID verification, record weight and length (actual if possible, otherwise estimate)
If many animals of the same species, at a minimum, record the number of animals and photograph as many as possible. Each animal must have it’s own entry on the [Individual Animal Log](#).

Groundfish Species

- Cod, Atlantic
- Flounder, Am. Plaice
- Flounder, Windowpane
- Flounder, Winter
- Flounder, Witch
- Flounder, Yellowtail
- Haddock
- Hake, White
- Halibut, Atl.
- Ocean Pout
- Pollock
- Redfish, NK
- Wolffish, Atlantic

ASM

Fixed gears are those that are set to soak in a particular area, typically un-attached from the vessel, and retrieved after a period of time that can range from less than an hour to more than a week.

Common features:

A surface system marking the location of the beginning and end of the full gear or “string”, composed of high flyers and/or buoys, and a buoyline from the surface system to the gear.

Anchors (not present in some types) are used to hold the gear to the bottom, and other weights and/or floats may be added to fish the gear at the desired location in the water column.

Gears are typically similar within a trip and may be hard to distinguish. Identifying marks on the surface system can help reduce confusion.

Active Marine Mammal Deterrent Devices (Pingers)



AIRMAR



DUKANE



FUMUNDA



FUTURE OCEANS LED

Anchors

Dead Weight



Chain



Railroad Track



Mushroom

Danforth-Style (Burying Anchor)



Other



Kedge



Grapnel



Claw Hook

Additional Weights

- NOT anchors
- Used on the leadline
- Do not combine the weight of the leadline with additional weights.



Sash Weights

Surface System

- Configuration of high flyer and buoy attached to the buoyline marking an end of fixed gear



Surface Buoy Marks

- Hull #, Permit #, or Vessel ID
- Identifies gear to vessel



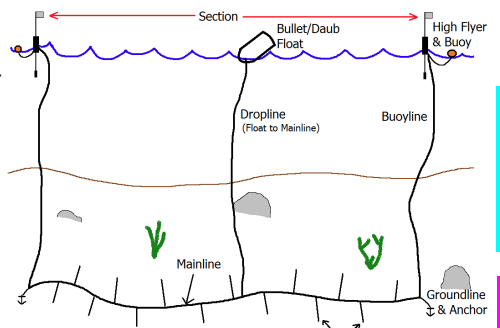
Buoyline Marks

- Identifies fishery
- Green = Gillnet
- Red = Lobster Pot can vary by area and target



Floats & Droplines

- Droplines attach a float to mainline or net and are found within the middle of a section of gear
- Do not confuse with surface system and buoyline



Weak Links

- Breakable components of the gear that will part when subjected to a certain tension load
- Used for compliance with Atlantic Large Whale Take Reduction Plan (ALWTRP)



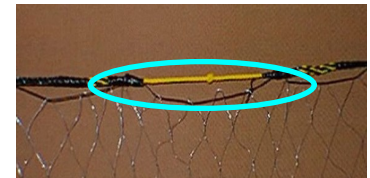
Off-the Shelf



Hog Rings: metal crimps that connect the line and part under a load



Rope of Appropriate Breaking Strength



Overhand Knot/Jumper Line

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Complete Gillnet

- Observe every haul
- Biologically sample every haul
- Actuals weights or tallies on discards
- No protected species watches

Limited Gillnet

- Protected species watch every haul
- All hauls unobserved
- Biologically sample kept catch after last haul of trip (day trip) or each day (multi-day trip)
- Do not record discards, except for IALs or Incidental Takes

Beach Seine

- Protected species watch every haul
- Biologically sample every haul

If hauled onto beach

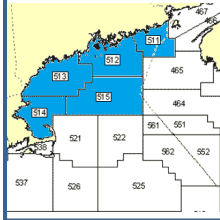
- Observe every haul
- Actuals weights on discards

If "fished over" by dory

- Record kept weights only

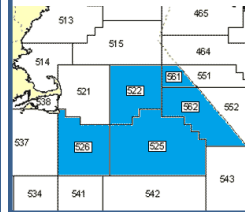
**Gulf of Maine
(Statistical areas 511-515)**

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Bass, Striped
Cod, Atlantic	Dogfish, Spiny
Cusk	Flounder, Am. Plaice
Flounder, Winter	Flounder, Witch (AS K)
Flounder, Witch (LF)	Flounder, Yellowtail (LF)
Haddock	Hake, Silver
Hake, White	Redfish
Halibut, Atlantic	Skate, Barndoor (D)
Herring, Blueback	Skate, Little
Monkfish	Skate, Thorny (D)
Pollock	Skate, Winter
Shad, American	
Wolffish, Atlantic	<u>Priority 3</u>
	Bluefish (LF KD, AS D)
	Flounder, Witch (AS D)
	Flounder, Yellowtail (AS)
	Hake, Red
	Mackerel, Atlantic
	Skate, Smooth (D)



**Georges Bank
(Statistical areas 522, 525, 526, 561, 562)**

<u>Priority 1</u>	<u>Priority 2</u>
Cod, Atlantic	Dogfish, Spiny
Cusk	Flounder, Am. Plaice
Haddock	Flounder, Witch
Hake, White	Hake, Silver
Halibut, Atlantic	Redfish
Monkfish	Skate, Barndoor (D)
Pollock	Skate, Little
Wolffish, Atlantic	Skate, Smooth
	Skate, Thorny (D)
	Skate, Winter
	<u>Priority 3</u>
	Bluefish (LF KD, AS D)
	Hake, Red
	Skate, Rosette

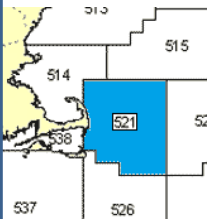


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ASM

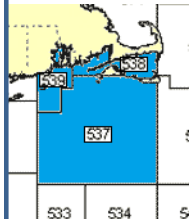
**Cape Cod
(Statistical area 521)**

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Flounder, Winter
Cod, Atlantic	Haddock (K)
Haddock (D)	Hake, Silver
Hake, White	Redfish
Herring, Blueback	Skate, Barndoor (D)
Monkfish	Skate, Little
Pollock	Skate, Smooth (D)
Shad, American	Skate, Thorny (D)
Wolffish, Atlantic	Skate, Winter
	<u>Priority 3</u>
	Bass, Striped
	Bluefish (LF KD, AS D)
	Cusk
	Hake, Red
	Mackerel, Atlantic
	Tautog



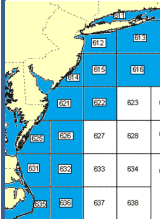
**Southern New England
(Statistical areas 537-539)**

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Cod, Atlantic
Herring, Blueback	Dogfish, Spiny
Monkfish	Skate, Barndoor (D)
Shad, American	Skate, Little
	Skate, Smooth
	Skate, Thorny (D)
	Skate, Winter
	<u>Priority 3</u>
	Bass, Striped
	Bluefish (LF KD, AS D)
	Flounder, Winter
	Mackerel, Atlantic
	Skate, Clearnose
	Skate, Rosette
	Tautog



**Mid-Atlantic
(Statistical areas 201, 393, 401, 611-616, 621, 622, 625, 626, 631, 632, 635, 636, 700-702, 707, 708)**

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Croaker, Atlantic
Bass, Striped	Drum, Red
Bluefish (LF KD, AS D)	Flounder, Windowpane (LF D)
Dogfish, Spiny	Herring, Atlantic
Flounder, Summer	Lobster, American (K)
Flounder, Winter	Mackerel, Atlantic
Flounder, Yellowtail (LF)	Mackerel, Spanish
Herring, Blueback	Menhaden, Atlantic
Lobster, American (D)	Sea Bass, Black
Monkfish	
Scup	<u>Priority 3</u>
Shad, American	Bonito
Weakfish	Drum, Black
	Flounder, Windowpane (LF K, AS KD)
	Flounder, Yellowtail (AS)
	Skate, Barndoor (D)
	Skate, Clearnose
	Skate, Little
	Skate, Rosette
	Skate, Winter
	Spot
	Tautog



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All Pot and Trap Fisheries

- *Inshore*: observe every haul
- *Offshore*: observe at least 75% of hauls
- Biologically sample the target species as a top priority

Lobster Pot

- Actual weights on all finfish
- Biologically sample all finfish for every observed haul
- Record the total number of lobsters, regardless of whether all were sampled
- *Strategy 1*: sample all lobsters on all hauls
- *Strategy 2*: sample all lobsters every other haul
- *Strategy 3*: subsample lobsters by trap, target 20% of traps (must be at least 10 traps per haul); weights may be actual, tally count, or extrapolated:

$$\text{multiplier} = \frac{\# \text{ of traps hauled}}{\# \text{ of traps sampled}}$$
- If crabs are not target, sample only after lobster and finfish

Aggregating traps (Inshore trips only)

If the captain is fishing trawls of 1, 2, or 3 pots in a small geographic area or in a line, observers may combine these groups or lines of traps into a single gear number and haul, which catch combined for all traps. The grouping must reflect the intent of the captain. You may use any sampling strategy when grouping trawls.

Fish Pot

- Actual weights for all catch, prioritize groundfish
- Biologically sample target species first, then other finfish

Conch Pot

Finfish

- Actual weights on discarded finfish
- Biologically sample finfish for every observed haul

Whelks

- Have crew separate kept from discard
- Biologically sample every observed haul; prioritize target
- If actual weights not possible by species, subsample by weight and extrapolate: multiplier = $\frac{\text{total pounds caught}}{\text{pounds sampled}}$
- If catches from hauls are mixed, use cumulative sum method and biologically sample first haul only

NEFOP

All areas		* Any other commercially important species, such as:
<u>Priority 1</u>	<u>Priority 2</u>	striped bass, bluefish, butterfish, cod, dogfish, flounders, haddock, hakes, herring, shads, mackerels, monkfish, ocean pout, pollock, redfish, scup, black sea bass, skates, squids, tautog, and tilefish.
Cusk (LF)	Crab, Jonah	
Hagfish	Crab, Red	
Lobster, American	Crab, Rock	
Other Fish*	Cusk (AS)	
Wolffish		

Bottom Longline

- Observe every haul
- Biologically sample at least every other haul
- Sample any commercially important species not listed here

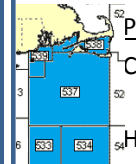
Gulf of Maine and Georges Bank
(Statistical areas 464, 465, 467, 511-515, 521, 522, 525, 526, 541-543, 561, 562)

Priority 1	Priority 2
Cod, Atlantic (LF)	Cod, Atlantic (AS D)
Cusk	Haddock (AS D)
Haddock (LF)	Hake, Red (LF)
Hake, White	Hake, Silver
Halibut, Atlantic	Pollock (AS D)
Monkfish	Skate, nk
Pollock (LF)	
Skate, Barndoor (D)	<u>Priority 3</u>
Skate, Thorny (D)	Cod, Atlantic (AS K)
Wolffish, Atlantic	Haddock (AS K)
	Hake, Red (AS)
	Pollock (AS K)



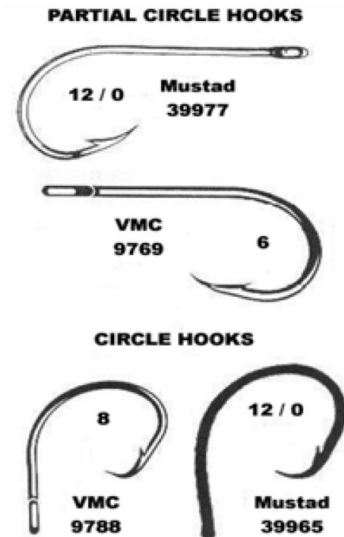
Southern New England
(Statistical areas 533, 534, 537-539)

Priority 1	Priority 2	Priority 3
Cod, Atlantic (LF)	Cod, Atlantic (AS D)	Cod, Atlantic (AS K)
Flounder, Summer	Hake, Red (LF)	Hake, Red (AS)
Monkfish	Skate, nk	
Skate, Barndoor (D)		
Tilefish		



Mid-Atlantic
(Statistical areas 611-616, 621-629, 631-639)

Priority 1	Priority 2	Priority 3
Flounder, Summer	Hake, Red (LF)	Hake, Red (AS)
Monkfish	Skate, nk	
Tilefish		

*Not actual size

Mustad = MUS + 5-8 Digits (Shiny Finish)
VMC = VMC + 4 digits (Matte/Dull Finish)

- Photograph with object for scale or obtain hook to send in with paper log data if possible
- Ask captain for box or packaging from sale
- Describe hook in comments if still unknown
- Hooks may bend from use

NEFOP

ASM

IFS

Mobile gears are those that are deployed from the vessel(s) and pulled through the water, before being retrieved onboard and the contents emptied.

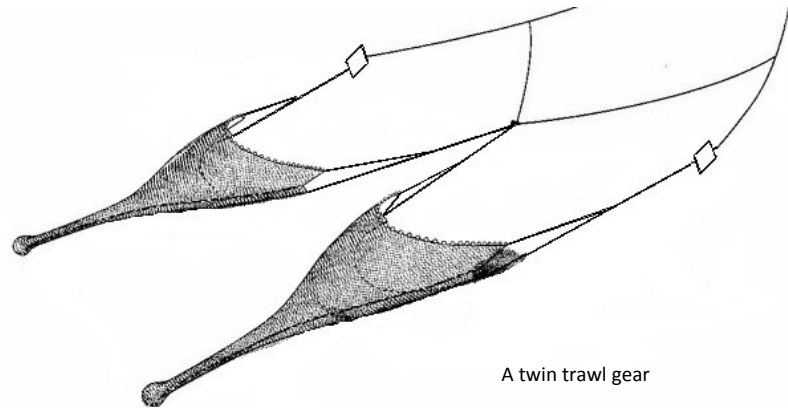
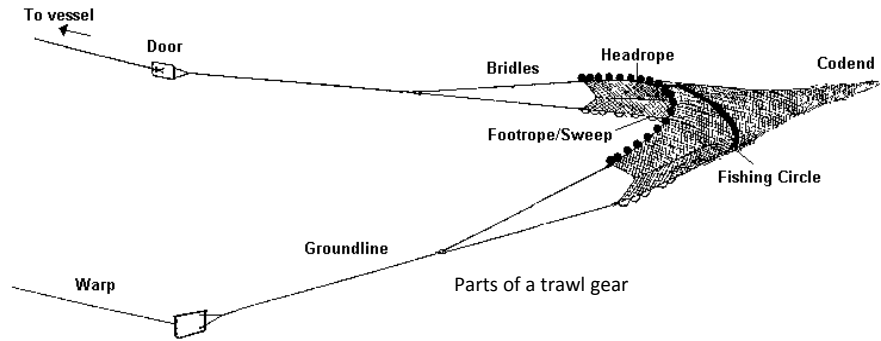
Common features:

On trawls, the net is kept open with doors and floats, and may be monitored by gear mounted electronics.

On dredges, the frame provides a fixed opening, while the cutting bar stirs up benthic creatures.

Gears may be modified during a trip to adjust fishing behavior. A new gear number must be created so catch can be associated with the corresponding gear configuration.

Catch is collected at the end of the gear, in a codend, chain bag, or bunt. Catch is often dumped into checker pens or on deck for sorting.



A twin trawl gear

NEFOP

ASM

IFS

All Bottom Trawls

- Observe at least 75% of hauls
- Biologically sample at least every other observed haul
- Prioritize actual weights on discards

Twin Trawl

- Record catch from both nets
- Biologically sample from both nets combined

Bottom Otter Trawl

See Tables on pages 15-16

Shrimp Trawl

- Obtain all actual weights on discards
- As of 1 January 1994, regulations mandate the use of a Nordmore Grate in all Shrimp Trawl gear which reduces finfish bycatch. Since none of these species may currently be kept, measurement of all discards should occur when time permits.

Massachusetts, New Hampshire, and Maine

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Flounder, Windowpane
Cod, Atlantic	Hake, Silver
Flounder, Am. Plaice	Hake, White
Flounder, Winter	Herring, Atlantic
Flounder, Witch	Lobster, American (K)
Flounder, Yellowtail (LF)	Skate, Barndoor (D)
Haddock	Skate, Little
Herring, Blueback	Skate, Thorny (D)
Lobster, American (D)	Skate, Winter
Monkfish	Wolffish, Atlantic (AS)
Ocean Pout	
Pollock	<u>Priority 3</u>
Redfish, nk	Flounder, Yellowtail (AS)
Shad, American	Hake, Red
Wolffish, Atlantic (LF)	Skate, Smooth (D)

Clam/Quahog Dredge

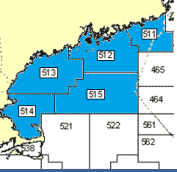
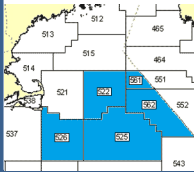
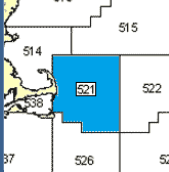
- Observe every haul during on-watch periods
- Biologically sample 30 clams/quahogs from each disposition on every other observed haul
- Biologically sample finfish at least once per watch, and any hauls with exceptionally large amounts of finfish bycatch

All Areas

<u>Priority 1</u>
Clam, Surf
Flounder, Summer
Quahog, Ocean
Scallop, Sea
<u>Priority 2</u>
Flounder, Yellowtail (LF)
Monkfish
Skate, Barndoor (D)
<u>Priority 3</u>
Flounder, Yellowtail (AS)
Skate, nk

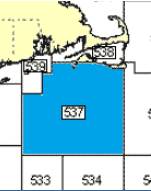
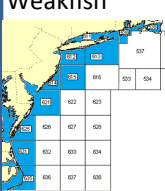
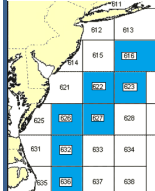
NEFOP

ASM

Gulf of Maine (Statistical areas 511-515)		Georges Bank (Statistical areas 522, 525, 526, 561, 562)		Cape Cod (Statistical area 521)	
<u>Priority 1</u>	<u>Priority 2</u>	<u>Priority 1</u>	<u>Priority 2</u>	<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Dogfish, Spiny	Cod, Atlantic	Butterfish	Alewife	Bass, Striped
Cod, Atlantic	Flounder, Witch (AS D)	Cusk	Dogfish, Spiny	Cod, Atlantic	Flounder, Windowpane
Cusk	Hake, Silver	Flounder, Summer	Flounder, Am. Plaice	Cusk	Flounder, Witch
Flounder, Am. Plaice	Herring, Atlantic	Flounder, Winter	Flounder, Windowpane	Flounder, Summer	Haddock (K)
Flounder, Winter	Ocean Pout	Flounder, Yellowtail (LF)	Flounder, Witch	Flounder, Winter	Hake, Silver
Flounder, Witch	Redfish, nk	Haddock	Hake, Silver	Flounder, Yellowtail (LF)	Herring, Atlantic
(LF, AS K)	Skate, Barndoor (D)	Hake, White	Herring, Atlantic	Haddock (D)	Ocean Pout
Flounder, Yellowtail	Skate, Little	Halibut, Atlantic	Ocean Pout	Hake, White	Redfish, nk
Haddock	Skate, Thorny (D)	Lobster, American	Redfish, nk	Herring, Blueback	Skate, Barndoor (D)
Hake, White	Skate, Winter	Monkfish	Skate, Barndoor (D)	Monkfish	Skate, Little
Halibut, Atlantic		Pollock	Skate, Little	Pollock	Skate, Smooth
Herring, Blueback	<u>Priority 3</u>	Wolffish, Atlantic	Skate, Smooth (D)	Shad, American	Skate, Thorny (D)
Monkfish	Bluefish (LF KD, AS D)		Skate, Thorny (D)	Wolffish, Atlantic	Skate, Winter
Pollock	Flounder, Yellowtail (AS)		Skate, Winter		Squid, Atl. Long-fin
Shad, American	Hake, Red				Squid, Short-fin
Wolffish, Atlantic	Skate, Smooth (D)				
					
			<u>Priority 3</u>		<u>Priority 3</u>
			Bluefish (LF KD, AS D)		Bluefish (LF KD, AS D)
			Flounder, Yellowtail (AS)		Butterfish
			Hake, Red		Flounder, Am. Plaice
			Squid, Atl. Long-fin		Flounder, Yellowtail (AS)
			Squid, Short-fin		Hake, Red
					Mackerel, Atlantic
					Tautog

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Southern New England (Statistical area 537)		Mid-Atlantic inshore (Statistical areas 538, 539, 611-615, 621, 625, 631, 635)		Mid-Atlantic offshore (Statistical areas 616, 622, 623, 626, 627, 632, 636)	
<u>Priority 1</u>	<u>Priority 2</u>	<u>Priority 1</u>	<u>Priority 2</u>	<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Bass, Striped	Alewife	Butterfish	Alewife	Butterfish
Butterfish	Cod, Atlantic	Bass, Striped	Herring, Atlantic	Flounder, Summer	Dogfish, Spiny
Flounder, Summer	Dogfish, Spiny	Bluefish (LF KD, AS D)	Lobster, American (K)	Herring, Atlantic	Flounder, Windowpane
Flounder, Winter	Flounder, Windowpane	Dogfish, Spiny	Mackerel, Atlantic	Herring, Blueback	Hake, Silver (LF)
Flounder, Yellowtail (LF)	Hake, Silver	Flounder, Summer	Ocean Pout	Monkfish	Lobster, American
Herring, Blueback	Herring, Atlantic	Flounder, Windowpane	Skate, Clearnose	Scup	Ocean Pout
Monkfish	Mackerel, Atlantic	Flounder, Winter	Skate, Little	Sea Bass, Black	Skate, Barndoor (D)
Scup	Ocean Pout	Flounder, Yellowtail (LF)		Shad, American	Skate, Clearnose
Sea Bass, Black	Skate, Barndoor (D)	Herring, Blueback	<u>Priority 3</u>	Squid, Atl. Long-fin	Skate, Little
Shad, American	Skate, Little	Lobster, American (D)	Croaker, Atlantic	Squid, Short-fin	Skate, Rosette
Squid, Atl. Long-fin	Skate, Thorny (D)	Monkfish	Drum, Black		Skate, Smooth (D)
	Skate, Winter	Scup	Drum, Red		Skate, Thorny (D)
	Squid, Short-fin	Sea Bass, Black	Flounder, Yellowtail (AS)		
		Shad, American	Mackerel, Spanish		<u>Priority 3</u>
		Squid, Atl. Long-fin	Menhaden, Atlantic		Bluefish (LF KD, AS D)
		Squid, Short-fin	Spot		Hake, Red
		Weakfish	Tautog		Hake, Silver (AS)
					Scallop, Sea
					Skate, Smooth (K)
					Skate, Winter
					Weakfish
					

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Program Code 042

Note: This list supersedes traditional NEFOP priorities.

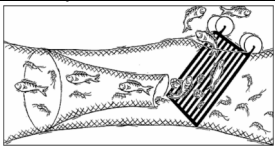
Bottom otter trawl (050), mesh size <5.5" (140mm)

Check with provider before deploying on small-mesh trips

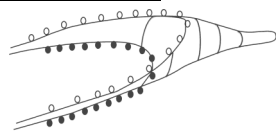
Species	State Sailed	Stat Areas	Target # Samples (per trip)	Comments
Black Sea Bass	RI, NY, MD, VA	533-539, 611-636	25 Otoliths	If otoliths cannot be taken, scales are the second preference.
Bluefish	RI, NY, NJ, MD, VA	Any	25 Otoliths	Only collect otoliths from fish > 45 cm. Heads can be taken in lieu of otoliths.
Atlantic Croaker	RI, NY, NJ, MD, VA	Any	25 Otoliths	
Atlantic Herring	RI, NJ	511-562, 611-636	50 Otoliths	
Alewife	RI, NY, NJ, MD, VA	Any	20 Scales	Freeze whole samples when possible.
Blueback Herring	RI, NY, NJ, MD, VA	Any	20 Scales	Freeze whole samples when possible.
Scup	RI, NY, NJ	521-562, 611-636	25 Scales	Larger fish are priority (>23cm).
Summer Flounder	RI, NY, NJ, MD, VA	521-562, 611-636	25 Otoliths	
Weakfish	RI, NY, NJ, MD	Any	25 Otoliths	Freeze samples when possible.
Winter Flounder	RI, NY, NJ	521-562, 631-636	25 Otoliths	

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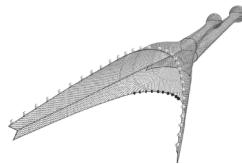
Examples of Excluder/Separator Devices



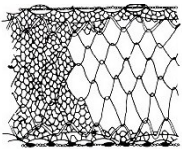
Grate / Guiding Device



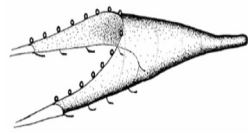
Headrope longer than footrope



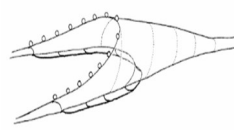
Separator Panel



Large Mesh



Sweepless Raised Footrope

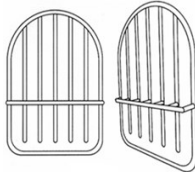


Raised Footrope

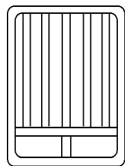
Examples of Turtle Excluder Devices (T.E.D.)



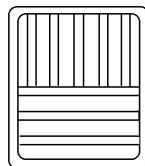
Standard



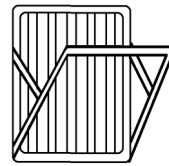
Weedless



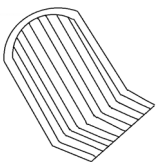
Conch



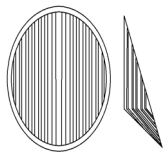
Flounder



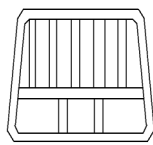
Fixed Angle



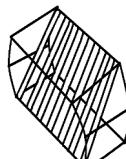
Bent Pipe



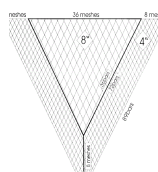
Bent Rod



Wheelk



Hooped

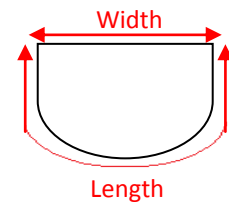
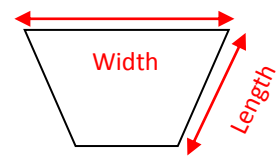
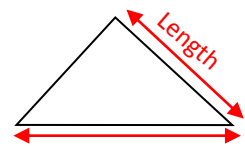


Parker Soft

Examples of Escape Outlets

- Section of large meshes
 - Opening or hole allowing non-target fish to exit
- Must** have an excluder or separator present

Measuring Bycatch Reduction Devices and Escape Outlets



Length = Front to back of net (mouth to codend)
Width = Seam to seam

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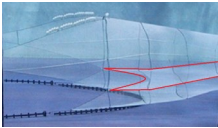
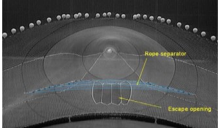
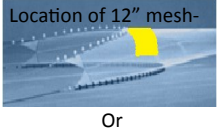


COMMUNICATION POINTS FOR IDENTIFYING TRAWL GEARS

Raised Footrope Trawl	<ul style="list-style-type: none"> No ground gear on the sweep (bare wire or chain sweep) 	<ul style="list-style-type: none"> Drop chains at least 42 inches long
Sweepless Trawl	<ul style="list-style-type: none"> No sweep attached to drop chains 	<ul style="list-style-type: none"> Drop chains at least 42 inches long
Balloon Trawl	<ul style="list-style-type: none"> High mouth, high-rise net 	<ul style="list-style-type: none"> Lighter net material and floats help net fish just off the bottom
Box Trawl	<ul style="list-style-type: none"> Always 4-seam 	<ul style="list-style-type: none"> Box-shaped, high rise net
Flynet	<ul style="list-style-type: none"> High profile net Headrope slightly longer than footrope 	<ul style="list-style-type: none"> Wing mesh size of 16-64 inches that slowly tapers Large number of floats– keeps net slightly off bottom
Millionaire Trawl	<ul style="list-style-type: none"> Always 4-seam, usually 3 bridles Very large openings in mouth, large meshes in wings 	<ul style="list-style-type: none"> Also called “40-footers”
Eliminator Trawl	<ul style="list-style-type: none"> Typically 4-seam, 3-bridle design Large mesh in wings, square and bottom belly 	<ul style="list-style-type: none"> May have kite panels Ruhle Trawl is a specialized type of Eliminator Trawl
Shuman Trawl	<ul style="list-style-type: none"> Very large meshes in mouth High-opening net 	<ul style="list-style-type: none"> May have kite panels
Monkfish Trawl	<ul style="list-style-type: none"> Large wing extensions 	<ul style="list-style-type: none"> Also called an “OLAK”
Flatfish Trawl	<ul style="list-style-type: none"> A net targeting flatfish that does not meet the specific criteria for a Flounder Trawl and is not described by a more specific type 	
Scallop Trawl	<ul style="list-style-type: none"> A trawl, or twin trawl, that is used to target scallops 	<ul style="list-style-type: none"> Headrope and footrope may be similar in length
Groundfish Trawl	<ul style="list-style-type: none"> Net targeting groundfish that is not described by a more specific net type 	

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Ruhle Trawl (054)		<ul style="list-style-type: none"> Large leading meshes (~8 feet) that taper towards the codend Kite panels 3-bridle configuration 4-seam net 	<p>If captain says it is a Ruhle Trawl but it doesn't have these characteristics, record "Eliminator Trawl". This includes if a liner has been added.</p>
Haddock Separator Trawl (057)		<ul style="list-style-type: none"> Mesh separator panel separates closed codend on the top from escape outlet on the bottom Could be either a 2-Seam or 4-Seam 	<p>If escape outlet is closed or the separator panel is removed during the trip and the gear is fished again, fill out a new gear log using gear code "050". Net type will be "Groundfish Trawl". Comment required.</p>
Rope Separator Trawl (050)		<ul style="list-style-type: none"> 4-seam net Horizontal separator panel made from parallel ropes spaced 1-2 feet apart Escape outlet in the bottom panel of net 	<ul style="list-style-type: none"> Vertical lines may be used to maintain the shape of the escape outlet <p>If possible, comment on distance between ropes in separator panel and take photos</p>
Flounder Trawl (050)	 <p>Location of 12" mesh- Or</p> 	<ul style="list-style-type: none"> 2-seam net Section of 12-inch meshes stretching back 10 feet behind head rope from seam to seam OR Headrope at least 30% longer than foot-rope, creating an "underbite" effect 	<p>If captain says his net is a flounder trawl, but it doesn't meet either of the criteria listed above, record it as a Flatfish Trawl on your gear log</p>
Large Mesh Belly Panel Trawl (150)		<ul style="list-style-type: none"> Panel of large meshes in the first belly Meshes are 80cm (30" inside knot-to-knot) 	<ul style="list-style-type: none"> Panel goes all the way from one bottom gore to the other Panel is 3 meshes deep (~90")

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COMMUNICATION POINTS FOR IDENTIFYING TRAWL GEARS

Volume-to-Volume Method Reminders

- Sketch and measure the checker pen or pile area
 - Include inside measurements for complicated shapes
- Collect 10 depths systematically
 - Before pen is flooded or catch is sorted
 - From all parts of the pile (tic-tac-toe)
 - Don't target high or low spots
 - Include one 0.0ft for piles not bounded on all sides
- Collect representative subsamples
 - From multiple parts of the pile (top, middle, bottom, sides, center)
 - Fill baskets and totes flush to the top, not heaped
 - Don't target certain species or animals
- Sort subsample by species and disposition
 - Ask captain or crew for help determining kept vs. discard
 - **Do not assume**
- Subsample weights must be actual, not estimates
 - For low weights, use your most precise scale
- Rare species
 - Pull out before volume-to-volume and get actual weights

Guidelines for determining how many baskets and/or totes you will need to obtain for an appropriate subsample.

Approximate Size all measurements in feet	Est. Catch Volume	# Baskets OR # Totes needed for 10-20% subsample	
		Baskets	Totes
5 x 5 x 1 or 5 x 10 x 0.5	25ft ³	2 - 3	1 - 2
5 x 5 x 2 or 5 x 10 x 1	50ft ³	3 - 7	2 - 4
5 x 10 x 1.5 or 10 x 10 x 0.8	75ft ³	5 - 10	3 - 6
5 x 10 x 2 or 10 x 10 x 1	100ft ³	7 - 14	4 - 8
5 x 10 x 2.5 or 10 x 10 x 1.3	125ft ³	9 - 17	5 - 9
10 x 10 x 1.5 or 10 x 15 x 1	150ft ³	10 - 20	6 - 11

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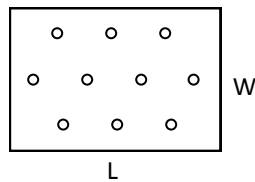
Example: 5.6' x 11.2' x 0.8' is approximately 5' x 10' x 1', so you should aim for 3-7 baskets or 2-4 totes.

Reminder: Examples are rounded for simplicity. Continue to record actual measurements on your logs.

Area Calculations

V = Volume
L = Length
W = Width
D = Depth
 $\pi = 3.14$
o = suggested locations to take depth measurements

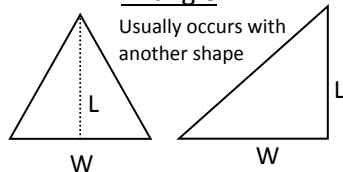
Rectangle



$V = L \times W \times D$

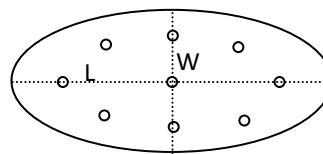
Triangle

Usually occurs with another shape

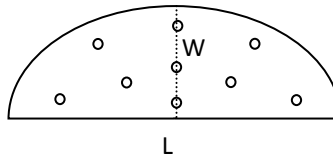


$V = L \times W \times D \div 2$

Oval and Half-Oval

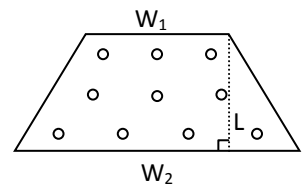


o Include one depth of 0.0ft



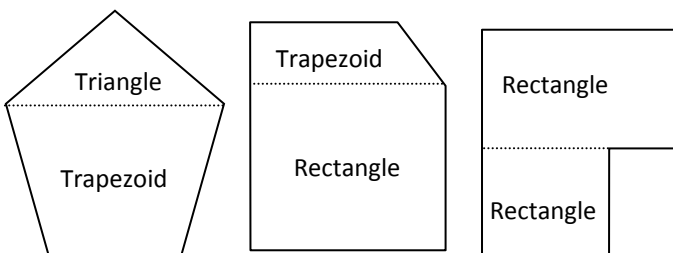
$V = W \times L \times D \times 0.785$

Trapezoid



$V = [(W_1 + W_2)] \times L \times D \times 0.5$

Combination



Working with gaps in catch



Many Small Holes
Spread catch to fill in holes before taking measurements



Checker Pen not Full
Square off and re-measure pile to only include area with catch; add 1 depth of 0.0ft

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Scallop Dredge and Scallop Trawl

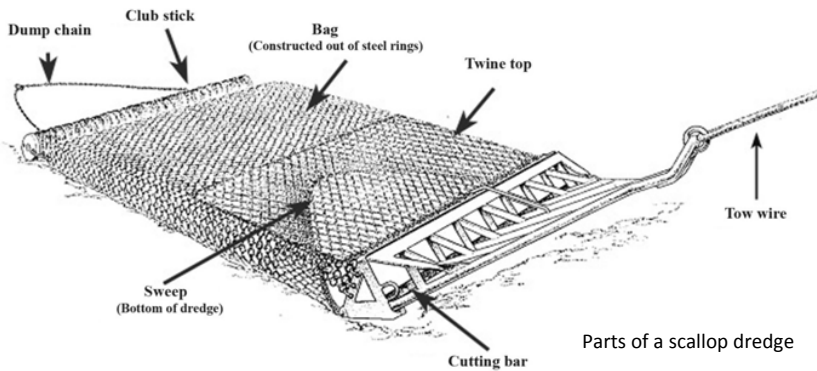
- Observe every haul during on-watch periods
- Record catch from both nets/dredges combined
- Biologically sample scallop shell heights from every other observed haul

First Haul of Watch

- Measure scallops from one basket of kept scallops in the shell
- Have crew member shuck scallops from that basket, obtain the meat weight (to the nearest 0.1lb) and obtain corresponding volume (to the nearest 50mL)

Other Hauls in Watch

- Measure 100 scallops in the shell from both dredges for each disposition
- Biologically sample finfish at least once per watch, and any hauls with exceptionally large amounts of finfish bycatch
- If grey meats or parasites are observed, resample meat weight at least twice per watch; weigh affected meats separately from clean meats



All areas	
<u>Priority 1</u>	<u>Priority 2</u>
Flounder, Summer	Cod, Atlantic
Flounder, Windowpane (LF)	Flounder, Windowpane (AS)
Flounder, Winter	Skate, Barndoor (D)
Flounder, Yellowtail (LF)	
Monkfish	<u>Priority 3</u>
Scallop, Sea	Flounder, Yellowtail (AS)
	Ocean Pout
	Skate, nk

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General Strategies

- Communicate with captain and crew
 - Ask them not to throw discards overboard, especially finfish
- Be present for all hauls in a deckload period, if possible (may have to adjust on/off-watches)
- Be organized, keep track of pile measurements
- If crew sorts catch during the deckload, keep track of weight/baskets removed

Scenario 1: Starting and ending with a clear deck

- Once deckloading has stopped and crew finishes sorting catch, record baskets counts for kept catch and actual weights for all other species
- Divide total weights evenly among all hauls (cumulative sum)
 - Round to nearest whole pound
 - All hauls will have the same weights
- Actual weights are priority for totals
 - Kept catch: use basket count
 - Large catches: use volume-to-volume
 - Record all intermediate math

Preferred strategy for scallop trips

Scenario 2: Start with a clear deck and end with catch on deck

- Keep track of any catch removed during deckload
- Before going off-watch, measure the remaining volume of the catch pile
 - Collect subsample baskets of the remaining pile from multiple locations (top, middle, bottom, sides, center)
 - Use volume-to-volume method to extrapolate
- Add extrapolated weight to any previously removed catch
 - Divide those weights by number of hauls in the deckload period
 - Record as combination estimation method on all hauls

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Scenario 3: Start with catch on deck

- Do not double-count catch from unobserved hauls
- Measure volume of the remainder (existing pile)
- After the first pile (of the on-watch) is dumped, measure the pile again
- Collect a subsample from just the top of the pile (the catch just dumped)

$$\text{Volume of new haul} = \text{Total volume after new haul dumped} - \text{Remainder volume before new haul dumped}$$

- Use volume-to-volume to extrapolate
- Repeat for all hauls in deckload period

Preferred strategy for groundfish trips

1. Measure remainder volume
2. Measure total volume
3. Sub-sample only top layer



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Ideal situation: collect actual weights on all discards

If not possible, follow strategies below, keeping in mind:

- Communicate with the captain and crew to determine if the discard chute can be removed
- Take checker pen depths as soon as it is safe to do so because the checker pen may quickly be flooded or the conveyor may start moving catch
- Obtain kept catch weights by actual weights or basket/tote counts

Strategies are listed in priority order

Sampling Strategy 1: basket count of discards

- Collect and count baskets/totes of discards at end of conveyor by removing chute and allow all discards to drop into baskets/totes (total discards)
- Periodically save basket/totes for subsample (target 20%, about every 5th basket), dump others overboard
- Sort through basket/totes and obtain species weights
- Calculate total discards using the volume to volume section of the CEW
- Obtain actual weights or estimates of kept catch



Sampling Strategy 2: Subtract kept volume from total catch volume

- Obtain total catch volume from checker pen
- Collect subsamples from end of conveyor, spaced evenly apart
- Obtain volume of kept catch by counting catch containers and calculate total kept volume (e.g., # of baskets x 1.47ft³/basket)
- **Discard volume = total volume - kept volume**
- Extrapolate discard subsample weights to calculated discard volume
- Obtain kept catch weights by actual weights or basket/tote counts

Sampling Strategy 3: Standard volume to volume

- Used when you cannot collect catch at the end of the conveyor (e.g., chute cannot be removed, winches in way, safety)
- Obtain total catch volume from checker pen
- Collect subsamples directly from checker pen and follow standard volume-to-volume extrapolation
- Obtain kept catch weights by actual weights or basket/tote counts
 - Record kept catch subsample weight/extrapolation in comments

For subsampled species that are both kept and discarded

- A.** Have crew member sort subsample to distinguish, or
- B.** Extrapolate total weight from subsample for that species
Discard weight = Total extrapolated weight - kept weight

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High Volume Fisheries are defined by very large catches of many small fish, which are typically pumped onboard, rather than hauled.

Every haul requires a Discard Log, unless there is no catch (kept or discard).

Catch Composition method:

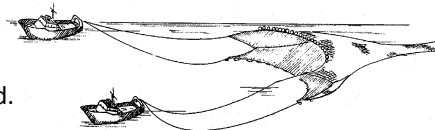
Sampling interval = estimated pumping time ÷ 10

At beginning of pumping, and then again after each sampling interval, take a full flush basket of catch from the chute(s) leading into the hold.

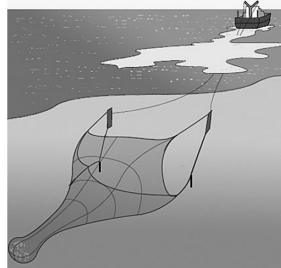
After pumping has completed, sort and weigh catch from each basket individually, then record and follow extrapolation instructions on the Catch Composition Log.

Operational Discards: Fish that cannot be pumped and remain in the net at the end of pumping operations.

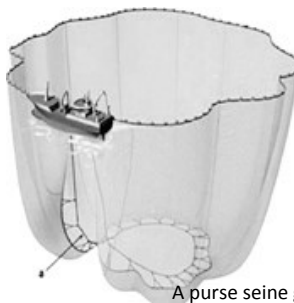
Slippage: Catch that is discarded prior to being observed, sorted, sampled, and/or brought onboard the fishing vessel.



A paired midwater trawl gear



A single midwater trawl gear



A purse seine gear

Paired and Single Midwater Trawl and Purse Seine Sampling Priorities

- Observe every haul
- Biologically sample every haul
- Obtain actual weights from subsample baskets collected at evenly spaced intervals throughout haul/pumping for Catch Composition extrapolation
- Fully document all discarding events, including catch discarded before coming onboard

Pair Trawl*

Paired vessel does have observer

- Only record catch pumped to your vessel
- Comment on catch pumped to any other vessel

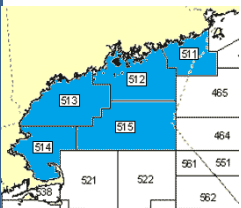
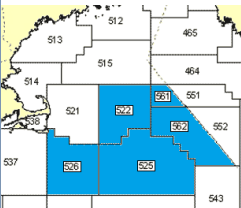
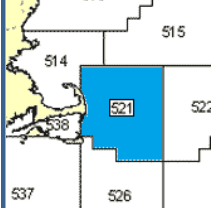
Paired vessel does not have observer

- Record catch for both vessels
- Use disposition code 110 for catch pumped/transferred to other vessel

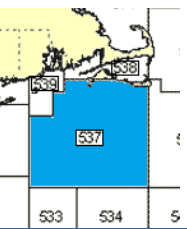
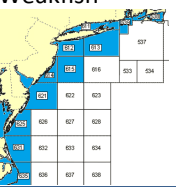
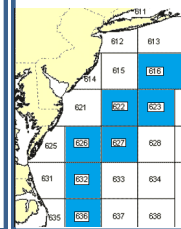
*And purse seine, if pumping to a carrier vessel

See Tables on pages 27-28

NEFOP

Gulf of Maine (Statistical areas 511-515)		Georges Bank (Statistical areas 522, 525, 526, 561, 562)		Cape Cod (Statistical area 521)	
<u>Priority 1</u>	<u>Priority 2</u>	<u>Priority 1</u>	<u>Priority 2</u>	<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Dogfish, Spiny	Cod, Atlantic	Dogfish, Spiny	Alewife	Flounder, Windowpane
Cod, Atlantic	Flounder, Witch (AS)	Cusk	Flounder, Am. Plaice	Cod, Atlantic	Haddock (K)
Cusk	Hake, Silver	Flounder, Summer	Flounder, Windowpane	Cusk	Hake, Silver
Flounder, Am. Plaice	Hake, White (K)	Flounder, Winter	Flounder, Witch	Flounder, Summer	Redfish, nk
Flounder, Winter	Redfish, nk	Flounder, Yellowtail (LF)	Hake, Silver	Flounder, Winter	Skate, Barndoor (D)
Flounder, Witch (LF)	Skate, Barndoor (D)	Haddock	Hake, White (K)	Flounder, Yellowtail (LF)	Skate, Little
Flounder, Yellowtail (LF)	Skate, Little	Hake, White (D)	Lobster, American	Haddock (D)	Skate, Smooth
Haddock	Skate, Thorny (D)	Herring, Atlantic	Ocean Pout	Hake, White	Skate, Thorny (D)
Hake, White (D)	Skate, Winter	Monkfish	Redfish, nk	Herring, Atlantic	Skate, Winter
Herring, Atlantic	Wolffish, Atlantic (AS)	Pollock	Skate, Barndoor (D)	Herring, Blueback	Squid, Atl. Long-fin
Herring, Blueback		Wolffish, Atlantic (LF)	Skate, Little	Mackerel, Atlantic (LF)	Squid, Short-fin
Monkfish	<u>Priority 3</u>		Skate, Smooth (D)	Monkfish	Wolffish, Atlantic (AS)
Pollock	Bluefish (LF KD, AS D)		Skate, Thorny (D)	Pollock	
Shad, American	Flounder, Yellowtail (AS)		Skate, Winter	Shad, American	<u>Priority 3</u>
Wolffish, Atlantic (LF)	Hake, Red		Wolffish, Atlantic (AS)	Wolffish, Atlantic (LF)	Bluefish (LF KD, AS D)
	Skate, Smooth (D)				Butterfish
					
		<u>Priority 3</u>			
		Bluefish (LF KD, AS D)			Flounder, Yellowtail (AS)
		Butterfish			Hake, Red
		Flounder, Yellowtail (AS)			Mackerel, Atlantic (AS)
		Hake, Red			Tautog
		Squid, Atl. Long-fin			
		Squid, Short-fin			

NEFOP

Southern New England (Statistical area 537)		Mid-Atlantic inshore (Statistical areas 538, 539, 611-615, 621, 625, 631, 635)		Mid-Atlantic offshore (Statistical areas 616, 622, 623, 626, 627, 632, 636)	
<u>Priority 1</u>	<u>Priority 2</u>	<u>Priority 1</u>	<u>Priority 2</u>	<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Cod, Atlantic	Alewife	Lobster, American (K)	Alewife	Dogfish, Spiny
Flounder, Summer	Dogfish, Spiny	Bass, Striped	Mackerel, Atlantic (AS)	Flounder, Summer	Flounder, Windowpane
Flounder, Winter	Flounder, Windowpane	Bluefish (LF KD, AS D)	Skate, Clearnose	Herring, Atlantic	Hake, Silver
Flounder, Yellowtail (LF)	Hake, Silver	Dogfish, Spiny	Skate, Little	Herring, Blueback	Mackerel, Atlantic (AS)
Herring, Atlantic	Mackerel, Atlantic (AS)	Flounder, Summer		Mackerel, Atlantic (LF)	Skate, Barndoor (D)
Herring, Blueback	Skate, Barndoor (D)	Flounder, Windowpane	<u>Priority 3</u>	Monkfish	Skate, Clearnose
Mackerel, Atlantic (LF)	Skate, Little	Flounder, Winter	Croaker, Atlantic	Scup	Skate, Little
Monkfish	Skate, Thorny (D)	Flounder, Yellowtail (LF)	Drum, Black	Sea Bass, Black	Skate, Rosette
Scup	Skate, Winter	Herring, Atlantic	Drum, Red	Shad, American	Skate, Smooth (D)
Sea Bass, Black	Squid, Short-fin	Herring, Blueback	Flounder, Yellowtail (AS)	Squid, Atl. Long-fin	Skate, Thorny (D)
Shad, American		Lobster, American (D)	Mackerel, Spanish		Squid, Short-fin
Squid, Atl. Long-fin	<u>Priority 3</u>	Mackerel, Atlantic (LF)	Menhaden, Atlantic		
	Bluefish (LF KD, AS D)	Monkfish	Spot		<u>Priority 3</u>
	Bonito	Scup	Tautog		Bluefish (LF KD, AS D)
	Butterfish	Sea Bass, Black			Butterfish
	Flounder, Yellowtail (AS)	Shad, American			Hake, Red
	Hake, Red	Weakfish			Scallop, Sea
	Ocean Pout				Skate, Smooth (K)
	Skate, Clearnose				
	Skate, Rosette				Skate, Winter
	Skate, Smooth				Weakfish
	Tautog				

NEFOP

Targets per statistical area, for kept and discard separately.

SPECIES NAME	LENGTHS		SEX	SAMPLES	SPECIES NAME	LENGTHS		SEX	SAMPLES
Alewife	100	FL	-	-	Herring, Atlantic	50	FL	-	-
Bass, Striped	100	FL	-	-	Herring, Blueback	100	FL	-	-
Bluefish	100	FL	-	25 Otoliths	Lobster, American	200	CL	YES	-
Butterfish	100	FL	-	20 Otoliths*	Mackerel, Atlantic	100	FL	-	20 Otoliths*
Cod, Atlantic	100	FL	-	20 Otoliths	Mackerel, Spanish	100	FL	-	-
Clam, Surf	30 [†]	SW	-	-	Menhaden	50	FL	-	-
Crab, NK [‡]	200	CW	YES	-	Monkfish (≥40 cm)	100	O	-	15 Illicia
Croaker, Atlantic	50	TL	-	-	Monkfish (<40 cm)	100	O	-	10 Illicia
Cusk	100	TL	-	20 Otoliths	Ocean Pout	100	TL	-	-
Dogfish, Spiny	200	TL	YES	-	Pollock	100	FL	-	20 Otoliths
Drum, Black	50	FL	-	-	Quahog, Ocean	30 [†]	SW	-	-
Drum, Red	50	FL	-	-	Redfish, NK	100	FL	YES	20 Otoliths
Flounder, American Plaice	100	TL	-	20 Otoliths	Scallop, Sea	100	SH	-	-
Flounder, Summer	100	TL	-	20 Otoliths	Scup	100	FL	-	20 Otoliths
Flounder, Windowpane	100	TL	-	20 Otoliths	Sea Bass, Black	100	TL	-	20 Otoliths
Flounder, Winter	100	TL	-	20 Otoliths	Shad, American	100	FL	-	-
Flounder, Witch	100	TL	-	20 Otoliths	Spot	100	FL	-	-
Flounder, Yellowtail	100	TL	YES	20 Scales	Skate, NK [‡]	100	TL	-	-
Haddock, Large (>56 cm)	100	FL	-	20 Otoliths	Squid, Atlantic Long-fin	100	ML	-	-
Haddock, Scrod (48-56 cm)	50	FL	-	20 Otoliths	Squid, Short-fin	100	ML	-	-
Haddock, Small (<48 cm)	50	FL	-	20 Otoliths	Tautog	100	TL	-	-
Hagfish	100	TL	-	-	Tilefish	100	FL	-	20 Otoliths [§]
Hake, Red	100	TL	-	20 Otoliths	Weakfish	100	FL	-	-
Hake, Silver	100	FL	-	20 Otoliths	Whelk, NK [‡]	100	SW	-	-
Hake, White	100	TL	-	20 Otoliths	Wolffish, Atlantic	100	TL	-	20 Otoliths
Halibut, Atlantic	100	TL	-	20 Otoliths					

NEFOP

ASM

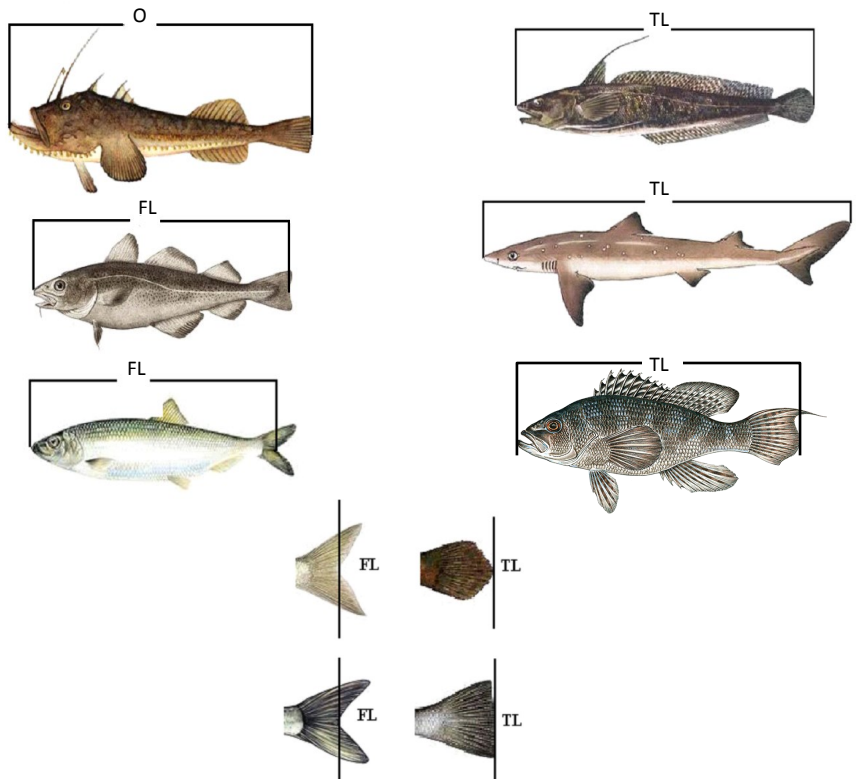
IFS

- * Heads may be collected in lieu of otoliths
- † If size distribution is variable, length target is 50
- § Bottom Longline fishery only
- ‡ "NK" indicates any species within that group

If sexing is required, obtain a random sample of that species, and then separate by sex while taking lengths.

TL = Total Length, cm
 FL = Fork Length, cm
 ML = Mantle Length, cm
 SW/SH = Shell Width/Height, mm
 CW/CL = Carapace Width/Length, mm
 O = Lower jaw to tip of tail, cm

Length Types of Various Fish (cm)



NEFOP

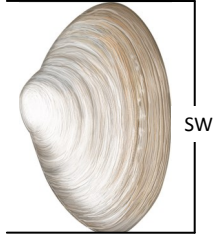
ASM

IFS

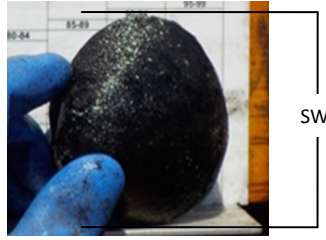
Scallop Shell Height (mm)



Clam Shell Width (mm)

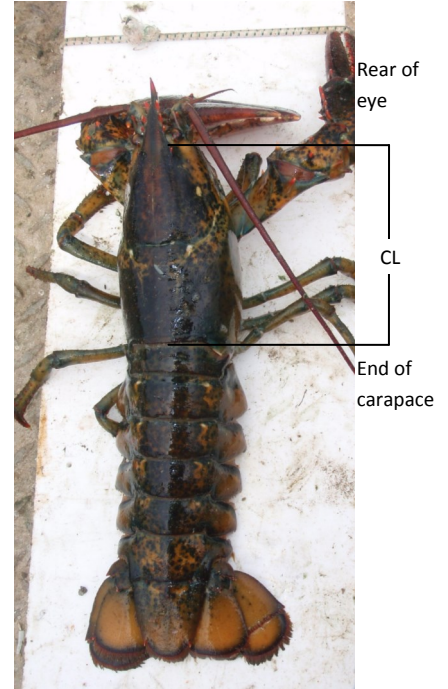


Surf Clam



Quahog

Lobster Carapace Length (mm)



Rear of eye

End of carapace

NEFOP

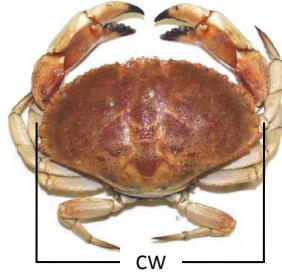
ASM

IFS

Whelk Shell Width (mm)

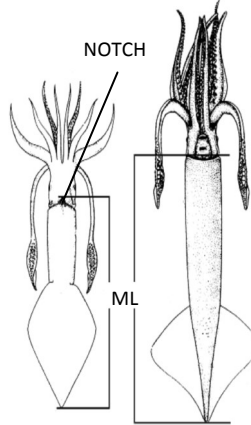


Crab Carapace Width (mm)



CW

Squid Mantle Length (cm)



NOTCH

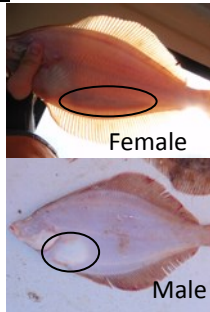
ML

Yellowtail Flounder

Hold fish up so light shines from behind it

Females: Dark sac (ovary); sickle shape extends towards tail along ventral side; orange eggs

Males: Small, light sac (testis); triangular shape near head; white milt



Female

Male

Sharks, Rays, and Skates

Females: No testes present

Skates: mature females have rough patches on both sides of anus

Males: 2 testes present (very small in juveniles)



Female

Adult Male

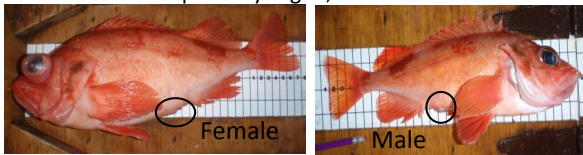
NEFOP

Redfish

Squeeze body slightly near pelvic fin

Females: No external copulatory organ; orange eggs

Males: External copulatory organ; white milt



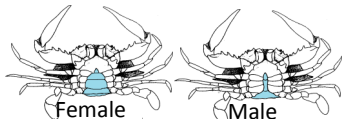
Female

Male

Crabs

Females: Abdomen wide, "U" shaped

Males: Abdomen thin, "V" shaped



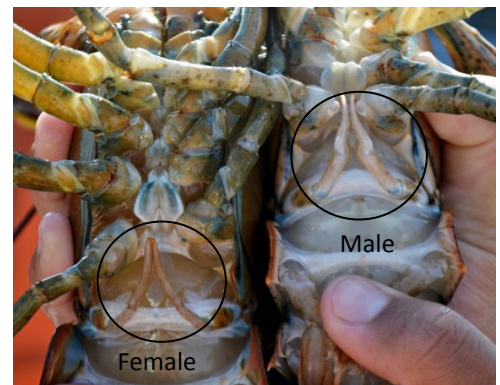
Female

Male

Lobsters

Females: First pair of swimmerets soft, feathery, bendable, flat. Large genital opening on 3rd pair of walking legs

Males: First pair of swimmerets hard, rigid, firm, round, smooth. Small genital opening on 5th pair of walking legs



Female

Male

IFS

Sampling for Each Animal

1. Photograph, including something for scale
2. Weigh or visually estimate
3. Measure lengths (see pages 35-36)
4. Check for the presence of tags
5. Scan for PIT tags (if issued a PIT tag scanner)
6. Determine sex (sharks & rays)
7. Describe identifying characteristics and condition

- If too many animals to sample individually:
- Count the number of individuals for each species.
 - If able, also break down your count by sex (if applicable) and estimate length/weight groupings.
 - You will still write each animal separately on the IAL.

Species to be recorded on the IAL

For a complete list and full species names: see Appendix T in the FSB Observer Data Entry Manual.

Amberjacks	Molas	Trout
Barracudas	Needlefish	Tunas***
Bonito, Atlantic*	Oilfish	Terrapin Turtles
Cobia	Opah	Wahoo
Dolphinfish (Mahi Mahi)	Rays & Stingrays**	Wreckfish
Escolar	Sailfish	
Groupers	Salmons	
Houndfish	Sharks (except Dogfish)	
Lancetfish	Spearfish	
Louvar	Sturgeons	
Mackerel, Frigate	Swordfish	
Mackerel, King*	Tarpon	
Marlins	Tripletail	

All tagged fish, shellfish, and crustaceans must be recorded on the IAL.

*These IAL species are recorded on the Haul Log in the gillnet fisheries.

**Bullnose & Cownose Rays should be recorded on the Haul Log.

***Little Tuna (False Albacore) and Skipjack Tuna are recorded on the Haul Log in the gillnet fisheries.

NEFOP

ASM

IFS

Record **all** tag recaptures on the Individual Animal Log and fully sample when possible (i.e., weather permitting and without interfering with the processing of a kept fish).

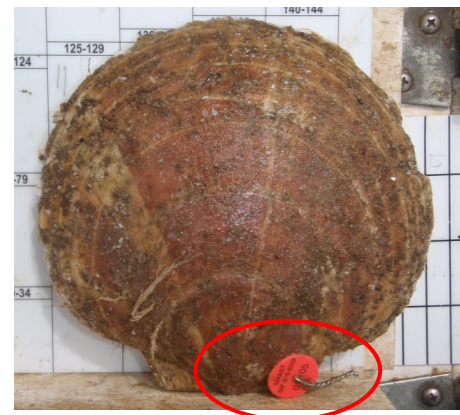
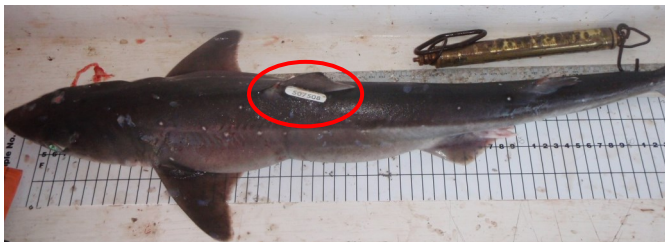
Record the following information:

Tag Number

Tag program name, address, phone number, and/or website

Comments regarding the animal condition at the tag location

Photograph all tagged fish, including a close-up of the tag location.



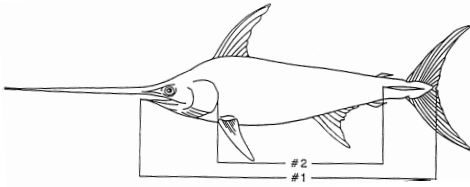
NEFOP

ASM

IFS

Length Measurements by Species/Group

Swordfish



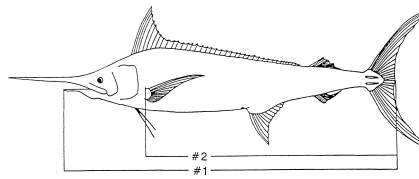
Measurements

- #1: LJFL, Tip of lower jaw to fork (curved)
- #2: CK, Cleithrum to anterior origin of caudal keel (curved)

Photographs to Take

1. Whole animal (side shot)
2. Dorsal fin, extended
3. Anal fin to anus

Marlin, Sailfish, Spearfish



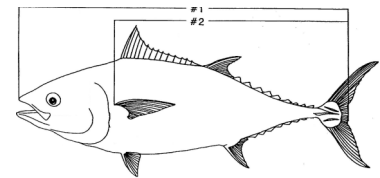
Measurements

- #1: LJFL, Tip of lower jaw to fork (curved)
- #2: PFL, Anterior pectoral fin to fork (curved)

Photographs to Take

1. Whole animal (side shot)
2. Dorsal fin, extended
3. Anal fin to anus

Tunas & Bonitos



Measurements

- #1: FL, Tip of upper jaw to fork
- #2: PFL, Anterior pectoral fin to fork

Photographs to Take

1. Whole animal (side shot)
2. Pectoral fin flat on body in relation to 2nd dorsal fin
3. 2nd dorsal fin and finlets
4. Belly/caudal peduncle

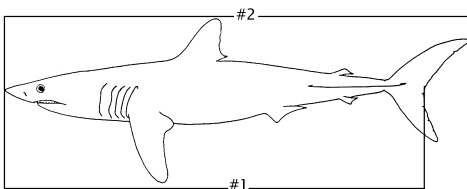
NEFOP

ASM

IFS

NOTE: All measurements straight unless otherwise

Sharks



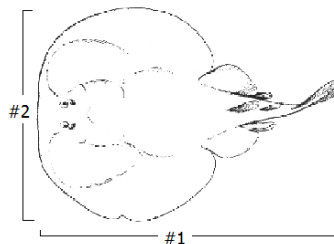
Measurements

- #1: FL, Tip of snout to fork
- #2: TL, Tip of snout to tip of upper caudal lobe

Photographs to Take

1. Whole animal (side shot)
2. Dorsal fin in relation to pectoral fin
3. Underside of snout
4. Caudal fin

Rays and Stingrays



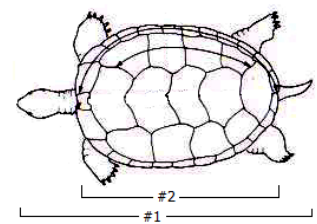
Measurements

- #1: TL, Total Length
- #2: DW, Disk Width

Photographs to Take

1. Whole animal (dorsal)
2. Whole animal (ventral)
3. Fin folds

Terrapins



Measurements

- #1: TL, Total Length (curved)
- #2: NL, Notch Length (curved)

Photographs to Take

1. Whole animal (dorsal)
2. Whole animal (ventral)
3. Close-up of head

NEFOP

ASM

IFS

Other IAL Species

Dogfish

- #1: TL, Total Length, Tip of snout to tip of upper caudal lobe

Measurements

- #1: FL, Fork Length

Photographs to Take

1. Whole animal (side shot)
2. Close-up of head
3. Any unique characteristics

Genetic Sample Collection Instructions

- *1. Photograph, including something for scale
- 2. Take biological samples:

Gill Swab

- 1. Remove sterile foam-tipped applicator from packaging, being careful not to contaminate the swab. Rub the foam tip along the inside of gills for 30 seconds, soaking as much mucus as possible, ensuring not to damage the gills. Repeat using opposite side.
- 2. Lift paper cover of FTA card. Roll the foam time along the circle sample area from tip-to-tip 3 times. Turn the applicator over and repeat in the same area.
- 3. If the sample area appears dry, repeat with a new applicator, applying the sample to the second circle on the card.
- 4. Once complete, circle around the outside of each sample area using a pencil. Allow card to dry at room temperature. Refold the paper cover over the sample area and record the TRIPID, Haul #, and IAL sequence # on the outside of the card in PERMANENT MARKER. STORE CARDS IN A DRY PLACE — DO NOT REFRIGERATE OR FREEZE.

Fin Clip

- 1. Using a CLEAN knife, cut a 1cm square sized piece of pelvic fin, place it into a vial of 95% non-denatured ethanol (one vial per fish).
- 2. Once you have screwed on the cap, wrap the cap in parafilm to minimize evaporation and leaking. Label the vial with TRIPID, Haul #, and IAL sequence # on the outside of the vial in PERMANENT MARKER.
- 3. Vials should be refrigerated and kept chilled for the first 24-48 hours. Otherwise, they can be stored at room temperature.
- 3. Scan for PIT tags on entire sturgeon (if issued a PIT tag scanner). If present, record the PIT tag number in the tag number field on the Individual Animal Log.
- *4. Measure fork length and actual weight, if possible.
- *5. Record all ID characteristics and animal condition (injuries, bruises, etc.).
- *ASM Trips: Follow steps 1, 4, and 5: photograph, measure, describe.



In 1994, sturgeon were stocked in the Hudson River, New York. These fish were marked by removing their left pelvic fin. Today these fish would be near 6 feet in length. Should you come across a large sturgeon that is missing its left pelvic, in addition to the above protocols, photograph the missing fin and comment on the Individual Animal Log.

NEFOP

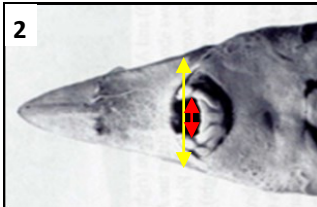
ASM

IFS

Atlantic Sturgeon

Max Length: over 9'

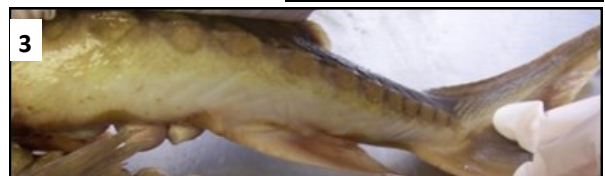
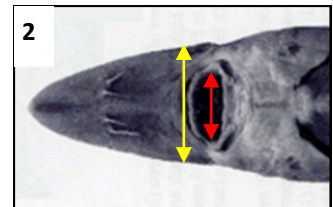
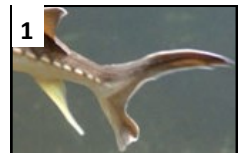
- 1. Post-dorsal fin plates above lateral plates
- 2. Width inside lips <60% interorbital width
- 3. 2-6 rows of bony plates between base of anal fin and lateral row of plates
- 4. More complex/paired post anal scutes
- 5. "Soft spot" on the head between dermal plates (raised) on skull



Shortnose Sturgeon

Max Length: 4'

- 1. No post-dorsal fin plates above lateral plates
- 2. Width inside lips >60% interorbital width
- 3. No bony plates between base of anal fin and lateral row of plates
- 4. Simple patterned post anal scutes
- 5. More contiguous with no "soft-spot"



NEFOP

ASM

IFS

Reminder: Use field guides for complete ID characteristics, and always submit photos of all criteria for verification. **BE SURE TO PROVIDE ID CHARACTERISTICS IN THE COMMENTS SECTION.**

IDENTIFICATION KEY FOR STURGEONS

Precautions When Handling Marine Mammals

Marine mammals can carry microbes which may cause illness in humans and other animals.

Safety measures to prevent illness and infections

- Use common sense!
- Wear gloves, face shield, and other protective gear when handling animals and specimens.
- Wash hands and other exposed areas thoroughly after contact.
- Clean/wash gear thoroughly after each use.
- Report any animal bite, scratch, or other significant exposure to marine animal blood, saliva, or excretions on an Incident Report.
- Tell your physician that you work with marine animals

NEFOP

ASM

IFS

Marine Mammal Samples

Minimum sampling requirements should always be completed.

Whole animals should be collected whenever possible. If the whole animal cannot be retained, collect the **head/jaw**.

After obtaining a DNA sample, if unable to retain whole specimen collect the following samples, if feasible:

whiskers (3 longest, pinnipeds only) blubber fetus (if aborted on deck)

On ASM trips, no samples are required. However, whole animals may be retained as time and space allow.

Minimum Sampling Requirements

Live animals:

1. Photograph and video (see box at right)
2. Describe identifying characteristics and condition, including any visible wounds
3. Release and comment on behavior and any gear remaining on animal

DO NOT TAG LIVE ANIMALS

Dead animals:

1. Collect DNA Sample (2"x2") from trailing edge of dorsal fin (cetaceans) or rear flipper webbing (pinnipeds)
- *2. Tag, using **yellow** marine mammal carcass tag
Apply around tail stock (cetaceans) or hind flipper (pinnipeds)
- *3. Photograph (see box at right), including something for scale
- *4. Describe identifying characteristics and condition, incl. any visible wounds
5. Collect Body Measurements (shown on next page):
7 for cetaceans (bottlenose = 11), 4 for pinnipeds
6. Collect Body Temperature
7. Determine Sex
- *8. Release and comment on behavior (e.g., sank immediately) and any gear remaining on animal

*ASM Trips: Follow steps 2, 3, 4, and 8: tag, photograph, describe, and release
Tagged animals (alive or dead): record tag number and photograph tag site

Photographs to take

- Entire animal on **all** sides
- Close-up of gear entanglement
- Close-ups of the head and teeth
- Genital area
- Any wounds, marks, scars, or damages
- Close-up of dorsal fin on both sides (cetaceans)
- Any tags, new or existing

NEFOP

ASM

IFS



Dorsal fin photos (both sides) are required for all bottlenose dolphin takes



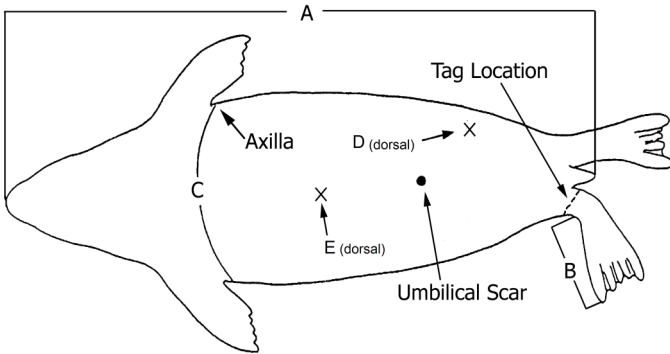
Marine Mammal Measurements

All measurements must be taken in a straight line (i.e., not curved with the body) except girth

Blubber thickness: include skin layer

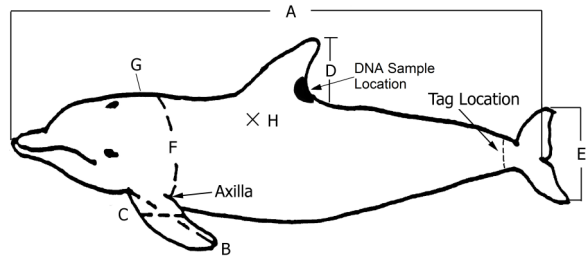
Body temperature: insert probe about 1" deep

Pinnipeds



- A. Total Length - snout to tip of tail
- B. Rear Flipper Length
- C. Girth at Axilla (circumference)
- D. Blubber Thickness (ventral)
- E. Body Temperature (dorsal)

Cetaceans

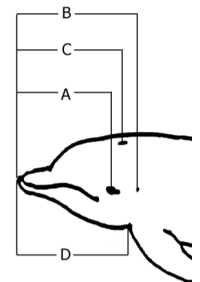


- A. Total Length - snout tip to fluke notch
- B. Flipper Length
- C. Flipper Width, maximum
- D. Height of Dorsal Fin
- E. Fluke Width, from tips of flukes
- F. Girth at Axilla (circumference)
- G. Blubber Thickness

Bottlenose Dolphins

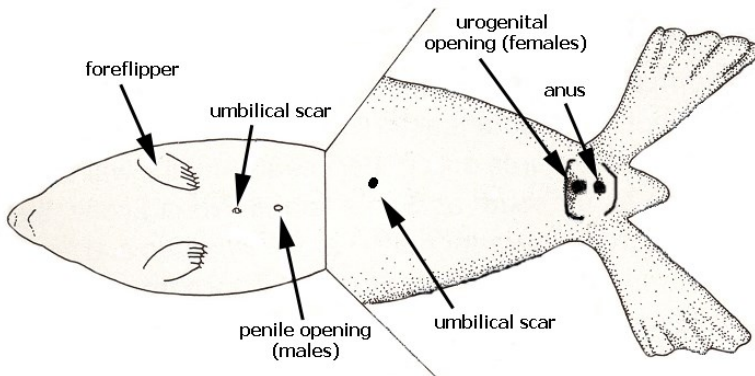
Additional measurements to take on **all** bottlenose dolphins.

- A. Snout to Center of Eye
- B. Snout to Ear
- C. Snout to Center of Blowhole
- D. Snout to Flipper Anterior Insertion



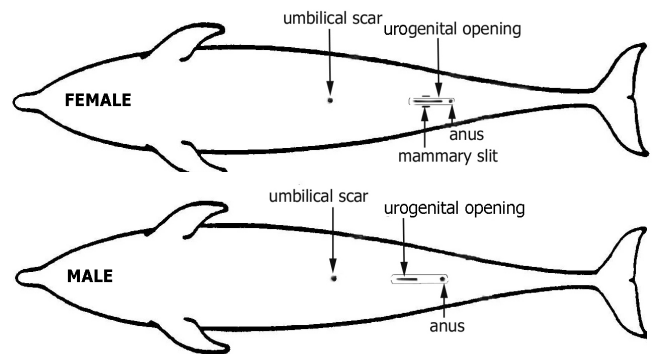
Marine Mammal Sex Determination

Pinnipeds



Stretch the rear flippers very wide apart at base of tail
 Look inside the outer (urogenital) opening
Female: 2 distinct inner openings (anal and vaginal)
Male: 1 inner opening (anal)

Cetaceans



Probe the urogenital opening
Female: forward, towards the head
Male: backward, towards the fluke

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HARBOR SEAL *Phoca vitulina concolor*

Light to dark gray, tan or reddish brown; most are paler on ventral side. Light and dark speckles with ring-like patterns or halos.



Distance from ear to eye and eye to end of snout nearly equal



Dog-like concave snout



Post-canines are multi-cusped & overlapping (like roof shingles).



V-Shaped nostrils

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HARP SEAL *Pagophilus groenlandica*

Pups have white-coats. Juveniles have dark "ink-blotches" randomly scattered on gray coat.

Adults are gray with black head and black harp pattern on back.

Post-canines are multi-cusped with distinct spaces between each tooth.



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GRAY SEAL *Halichoerus grypus*

Dark reddish brown, black to silvery gray. **Males:** Brown to black with light spots. **Females:** gray, yellowish tan with dark spots.

Distance from ear to eye much shorter than eye to end of snout



Flattened snout with W-shaped nostrils



Post-canines are canine-like with small cusps on each side



Horse-like head

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HOODED SEAL *Cystophora cristina*

Takes in Gulf of Maine, pups only. Bluish gray back with contrasting white belly.

Post-canines are round and multi-cusped.



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Animal brought onboard:

Follow minimum sampling requirements on page 40

Animal not brought onboard:

1. Photograph and video (see box at right)
2. Describe identifying characteristics and condition, including any visible wounds
3. Comment on behavior and any gear remaining on animal

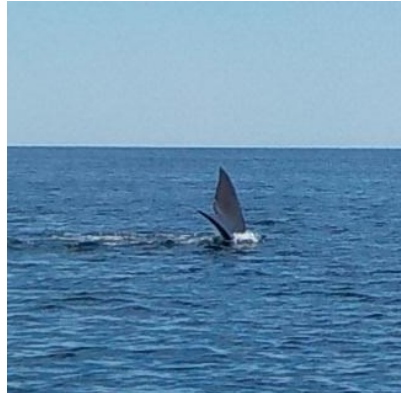
Photographs and videos to take

- Entire animal on **all** sides seen
- Gear entanglement
- Flukes, dorsal and ventral
- Dorsal fin
- Pectoral fins
- Callosities (right whales)
- Any wounds, marks, scars, or damages
- Any trailing gear
- Any tags, new or existing

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Reporting Right Whales and Dead Whales

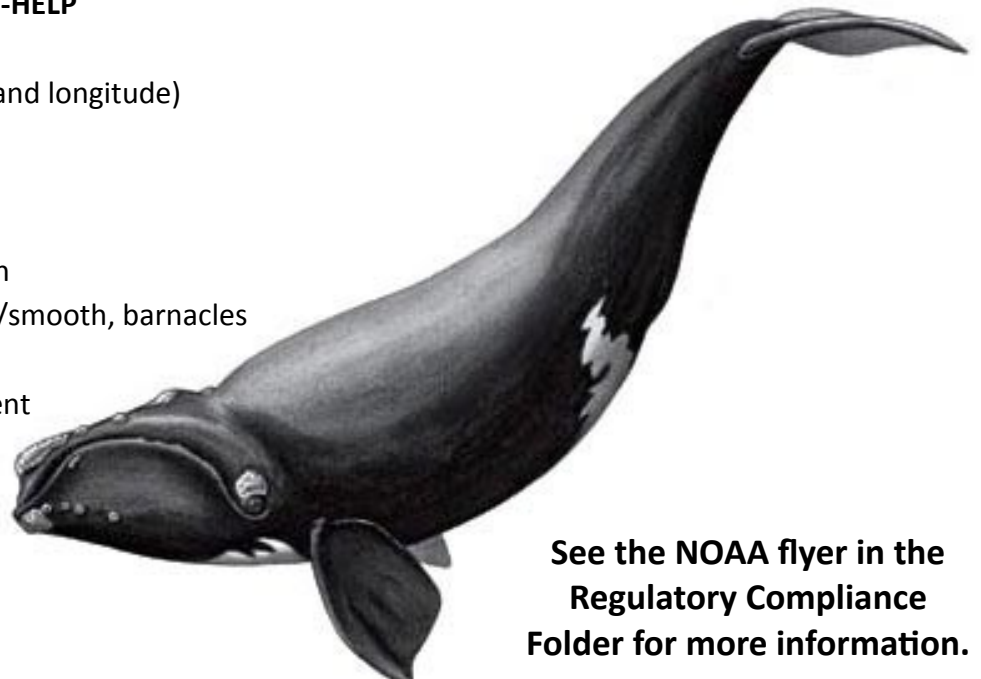
Coast Guard (channel 16)

Maine to Virginia: **866-755-NOAA**

North Carolina to Florida: **877-WHALE-HELP**

Provide:

- Date, time, and location (latitude and longitude)
- Identifying characteristics
 - Color
 - Size
 - Flippers - color, shape, length
 - Flukes - color, shape, ragged/smooth, barnacles
 - Dorsal fin present/absent
 - Throat grooves present/absent
 - Callosities present/absent
- Condition
- Any gear entanglement
- Number of whales
- Behavior (right whales)



See the NOAA flyer in the Regulatory Compliance Folder for more information.

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Live animals:

1. Photograph and video
2. Describe identifying characteristics and condition, including any visible wounds
3. Check for the presence of bands
4. Release and comment on behavior and any gear remaining on animal
Release away from gear, with vessel slowed
Lower bird by hand as close to water as possible, releasing hold of head last

- Photographs to take
- Entire animal, dorsal
 - Entire animal, ventral
 - Close-up of beak/head
 - Any wounds, marks, scars, or damages
 - Any existing bands or tags

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Dead animals:

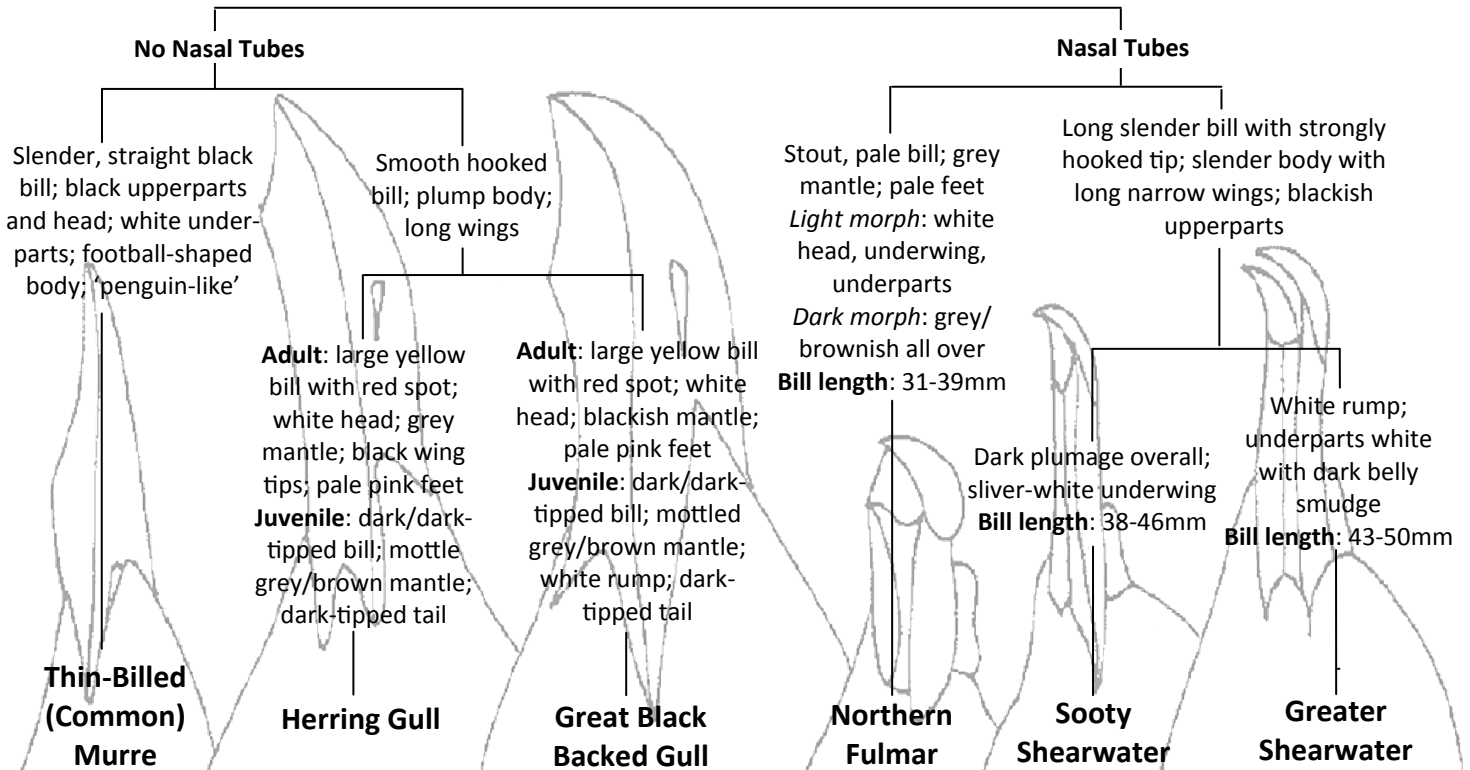
1. Photograph, including something for scale
2. Describe identifying characteristics and condition, including any visible wounds
3. Check for the presence of bands
Record band number and retain band, if possible
4. Retain whole seabird, if possible
Only retain “dead, fresh” animals; otherwise release



Tagged sea bird with a band around the leg and a tag on the wing

Reminder: Use field guides for complete ID characteristics, and always submit photos for verification. Consult your “Beached Birds” guide if your specimen does not fall into any of these categories.

Beak images not actual size



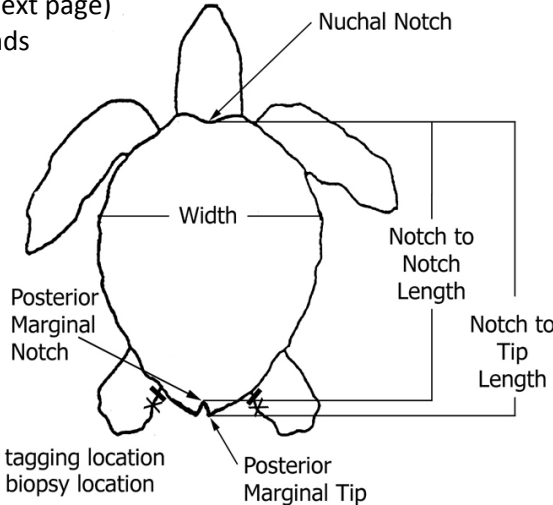
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All Turtles (alive or dead)

- *1. Photograph and video (see box to right), including something for scale
- *2. Describe identifying characteristics (see next page) and condition, including any visible wounds
- *3. Check for the presence of tags
Record tag number and photograph
- 4. Body measurements (3, curvilinear)
- 5. Biopsy/tissue (genetic) sample
Live animals: Biopsy if >25cm notch-to-tip
Dead animals: Retain whole animal, if possible; otherwise biopsy
- 6. Tag with Inconel tag(s) on rear flipper(s)
Live animals: 2 tags if >26 cm notch-to-tip
Dead animal: 1 tag
- 7. Scan for PIT tags on flippers and all soft tissues, if issued a PIT tag scanner
- *8. If **alive or comatose**, attempt resuscitation
If **obviously dead** (e.g., damaged shell, severely wounded), release



Photographs to take

- Close-ups of head:
 - Pre-frontal scute pattern
 - Top of head
 - Each side (left/right)
- Entire animal, dorsal
- Entire animal, ventral
- Any wounds, marks, scars, or damages
- Any tags, new or existing

Videos to take

- At capture/entanglement
- Behavior on deck
- At release
- Behavior in water after release

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***ASM Trips:** Follow steps 1, 2, 3, and 8: photograph, describe, tag, and release.

Inconel Tag

Tag along trailing edge of rear flipper
Leatherback turtles: 5cm (~2") from base of tail
All other turtles: soft tissue between body and first scale
 Approximately 1/3 of the tag should overhang body after it is attached

Existing Tags - Dead Turtles Only

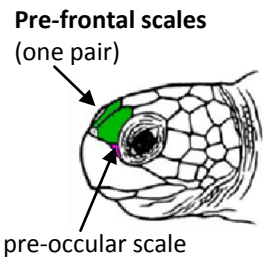
Inconel tags: record tag number and information, leave on animal.
Any other tag (metal, plastic, satellite, etc.): remove from the animal and retain.
 Tag number and information should still be recorded for all tags.

Biopsy Location

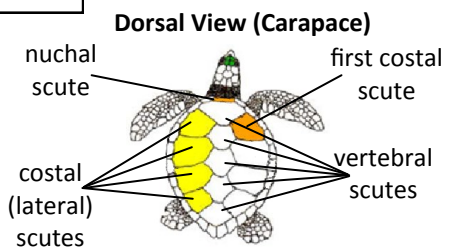
Just outside (away from the body) of the tag location
 One crescent shape biopsy per rear flipper (2 total)

Identification Criteria

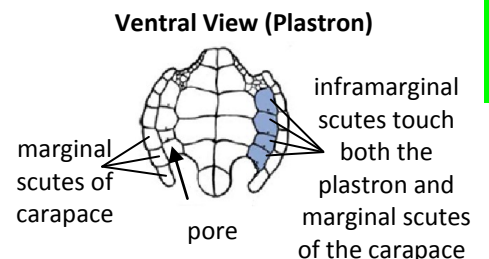
- Vertebral scute count
- Lateral scute count
- Inframarginal scute count
- 1 pair of prefrontal scales?
- Overlapping scutes?
- Dorsal color



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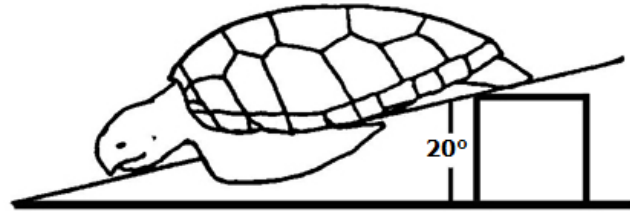


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Resuscitation must be attempted on sea turtles that are comatose or inactive, but not dead. **Do not assume that an inactive turtle is dead.** The onset of rigor mortis is often the only definitive indication that a turtle is dead.

1. Place the turtle right side up (on the bottom shell or plastron).
2. Elevate the hindquarter 20° for a period of 4 up to 24 hours.
3. Protect from environmental conditions.
4. Periodically rock the turtle from side to side (left to right) by holding the outer edge of the carapace and lifting one side about 3 inches.
5. Reflex Test: Lightly touch the upper eyelid, soft tissues surrounding the nose, or pinch the tail or flippers periodically to see if there is a response.

Those that revive and become active must be **re-leased over the stern** of the boat when **fishing gear is not in use**, when the **engine gears are in neutral** position, and in areas where they are unlikely to be recaptured or injured by fishing gear or vessels. Sea turtles that fail to respond to the reflex test or fail to move within several hours (up to 24, if possible) should be returned to the water in the same manner.

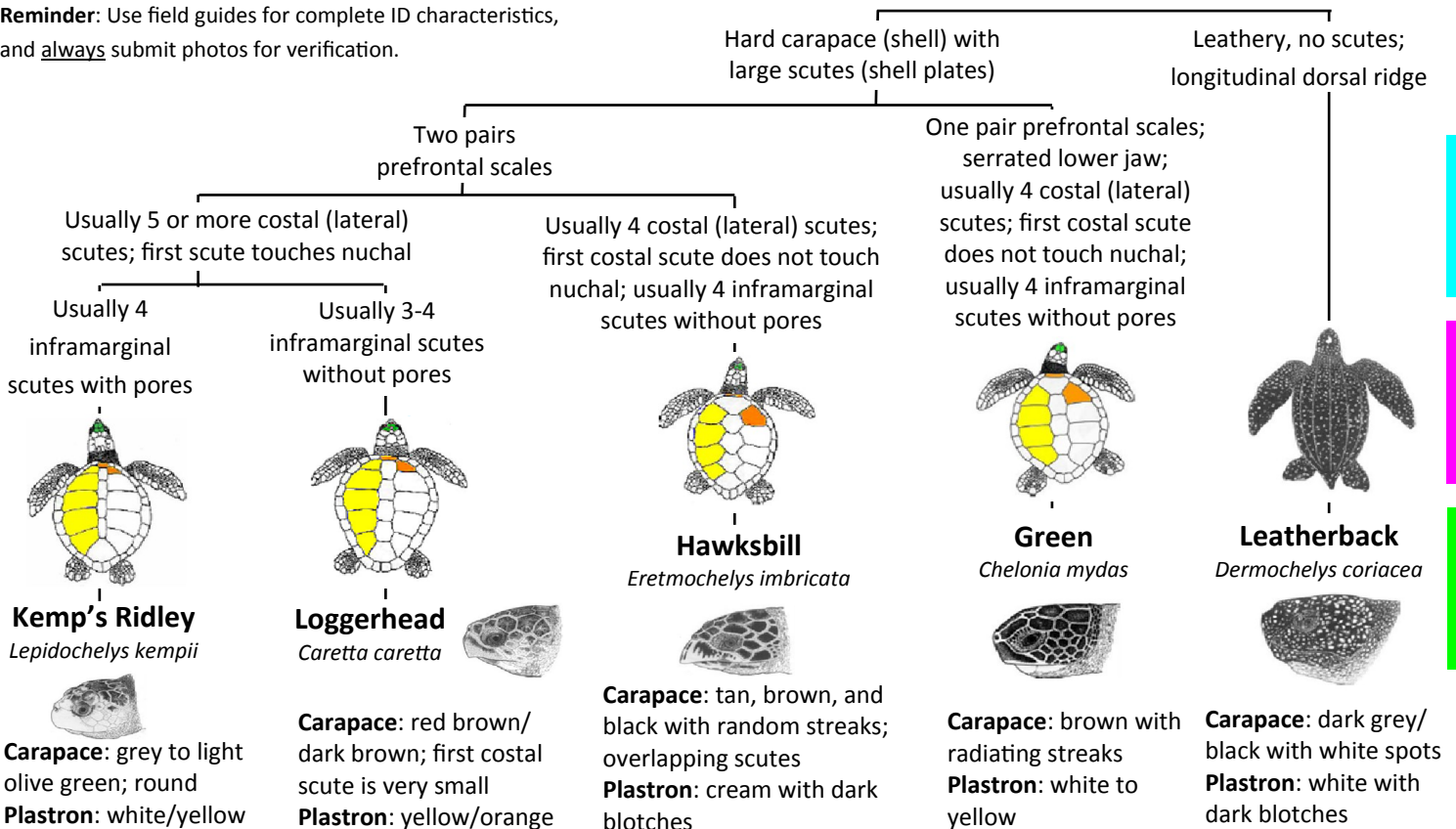


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Reminder: Use field guides for complete ID characteristics, and always submit photos for verification.



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Send in actual specimens and/or photographs of the following species each quarter

Miscellaneous	Photograph 1	Photograph 2	Photograph 3
Scup	whole animal (side shot)		
Atl. Longfin Squid	whole animal (side shot)		
Shortfin Squid	whole animal (side shot)		
Redfish	whole animal (side shot)	inside of mouth	
Ocean Pout	whole animal (side shot)		

Gadids	Photograph 1	Photograph 2	Photograph 3
Atl. Cod	whole animal (side shot)		
Haddock	whole animal (side shot)		
Pollock	whole animal (side shot)		
Red Hake	whole animal (side shot)	pelvic and dorsal filaments	rakers above the flexion point
White Hake	whole animal (side shot)	pelvic and dorsal filaments	rakers above the flexion point
Silver Hake	whole animal (side shot)	all rakers on first gill arch (removed from body)	
Offshore Hake	whole animal (side shot)	all rakers on first gill arch (removed from body)	

Skates	Photograph 1	Photograph 2	Photograph 3
Barndoor	whole animal (top of disk)	whole animal (bottom of disk)	
Clearnose	whole animal (top of disk)		
Little	whole animal (top of disk)	close-up of rough/smooth patch or claspers	
Smooth	whole animal (top of disk)		
Thorny	whole animal (top of disk)		
Winter	whole animal (top of disk)	close-up of rough/smooth patch or claspers	

Flounders	Photograph 1	Photograph 2	Photograph 3
Am. Plaice	whole animal (eyed side)	whole animal (blind side)	
Summer	whole animal (eyed side)	whole animal (blind side)	
Windowpane	whole animal (eyed side)	whole animal (blind side)	
Winter	whole animal (eyed side)	whole animal (blind side)	close-up of lateral line
Witch	whole animal (eyed side)	whole animal (blind side)	
Yellowtail	whole animal (eyed side)	whole animal (blind side)	close-up of lateral line

Herrings	Photograph 1	Photograph 2	Photograph 3
Alewife	whole animal (side shot)	gut lining	upper profile of lower jaw
Blueback	whole animal (side shot)	gut lining	upper profile of lower jaw
Am. Shad	whole animal (side shot)	rakers on first gill arch	upper profile of lower jaw
Hickory Shad	whole animal (side shot)	rakers on first gill arch	upper profile of lower jaw
Atl. Herring	whole animal (side shot)		
Atl. Menhaden	whole animal (side shot)	dorsal view (scales in front of dorsal fin)	

Always include something in each picture for scale.

<u>Quarters</u>
Jan - Mar
Apr - Jun
Jul - Aug
Sep - Dec

Additional photo requirements for every trip
High Volume and herring trips: all herrings listed above and Atlantic mackerel (whole animal, side shot)
Scallop trips: yellowtail flounder, both scallop dredges
Lobster trips: lobster egg stages
 Any unknown ID (Fish NK); also submit sample if possible
 Any animal damaged by sharks or marine mammals

American shad with seal damage



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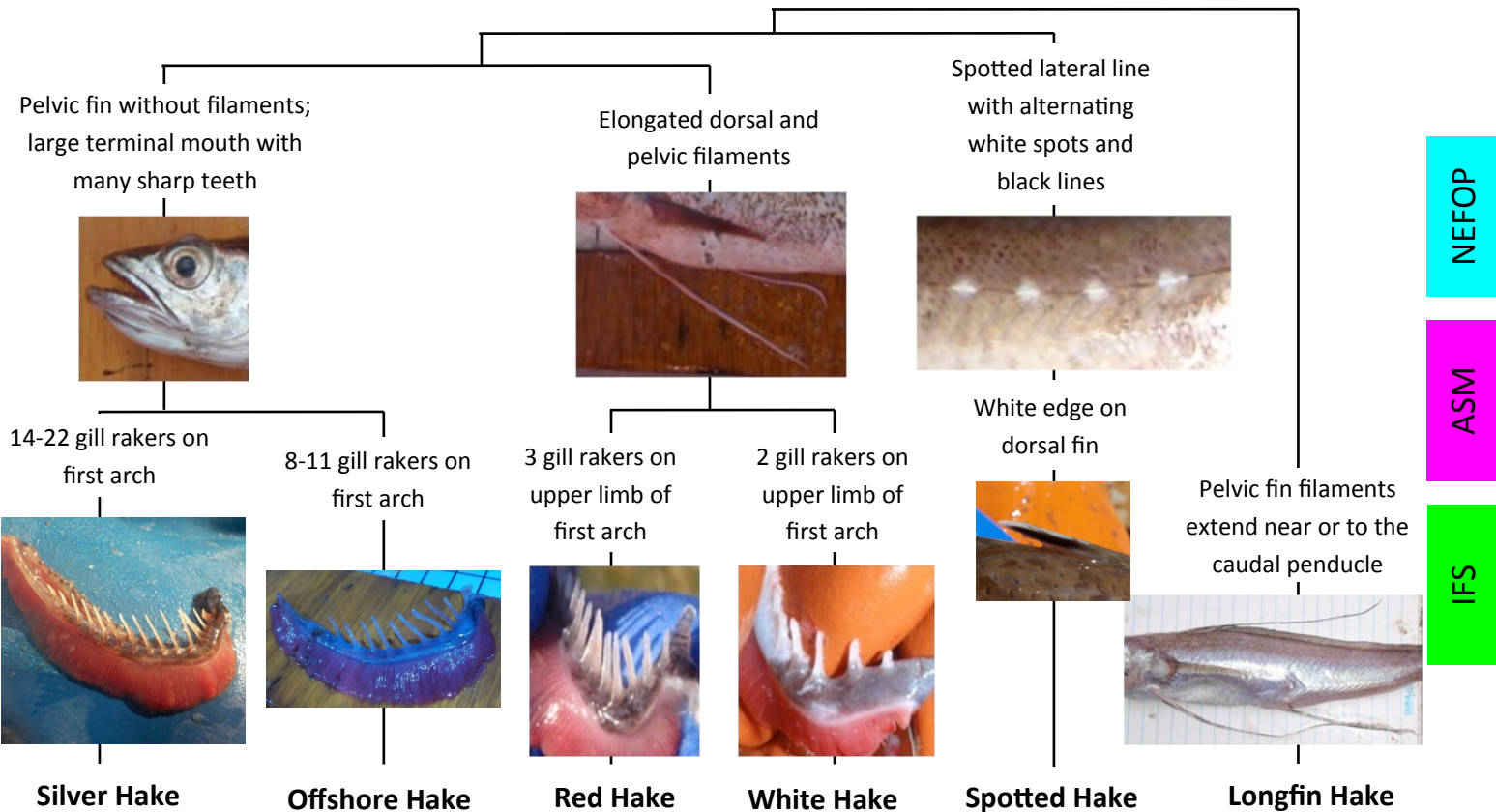
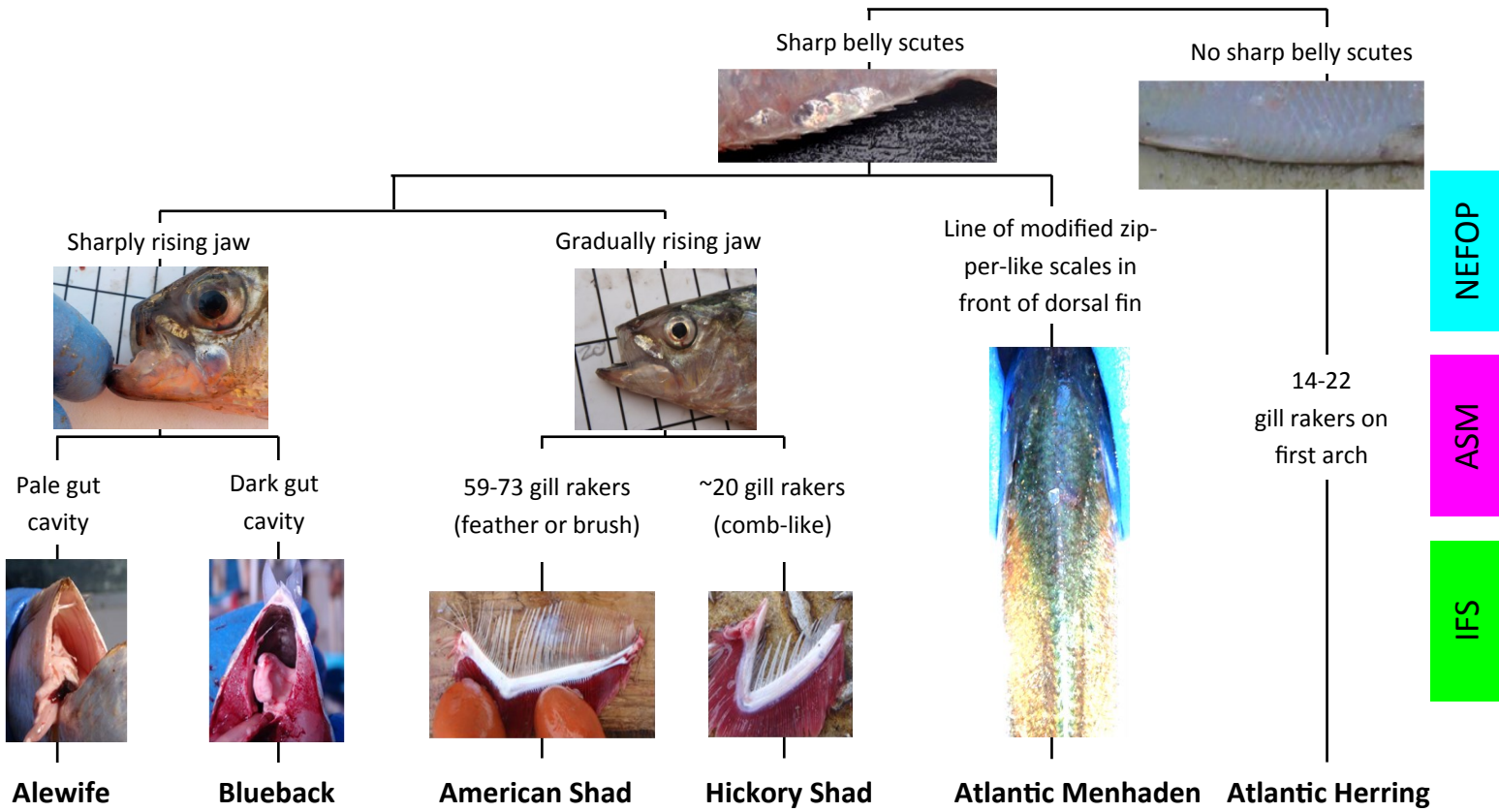
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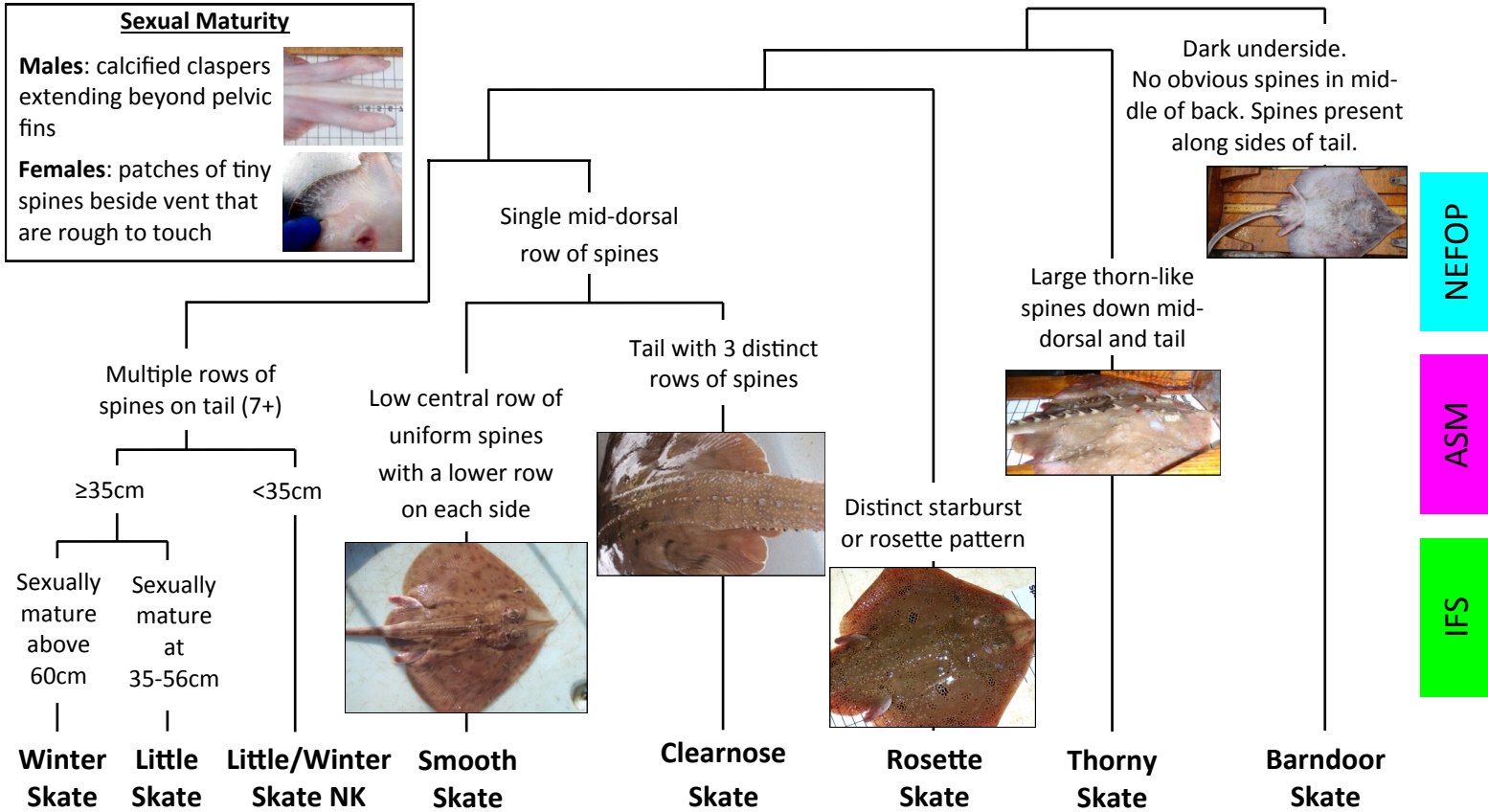
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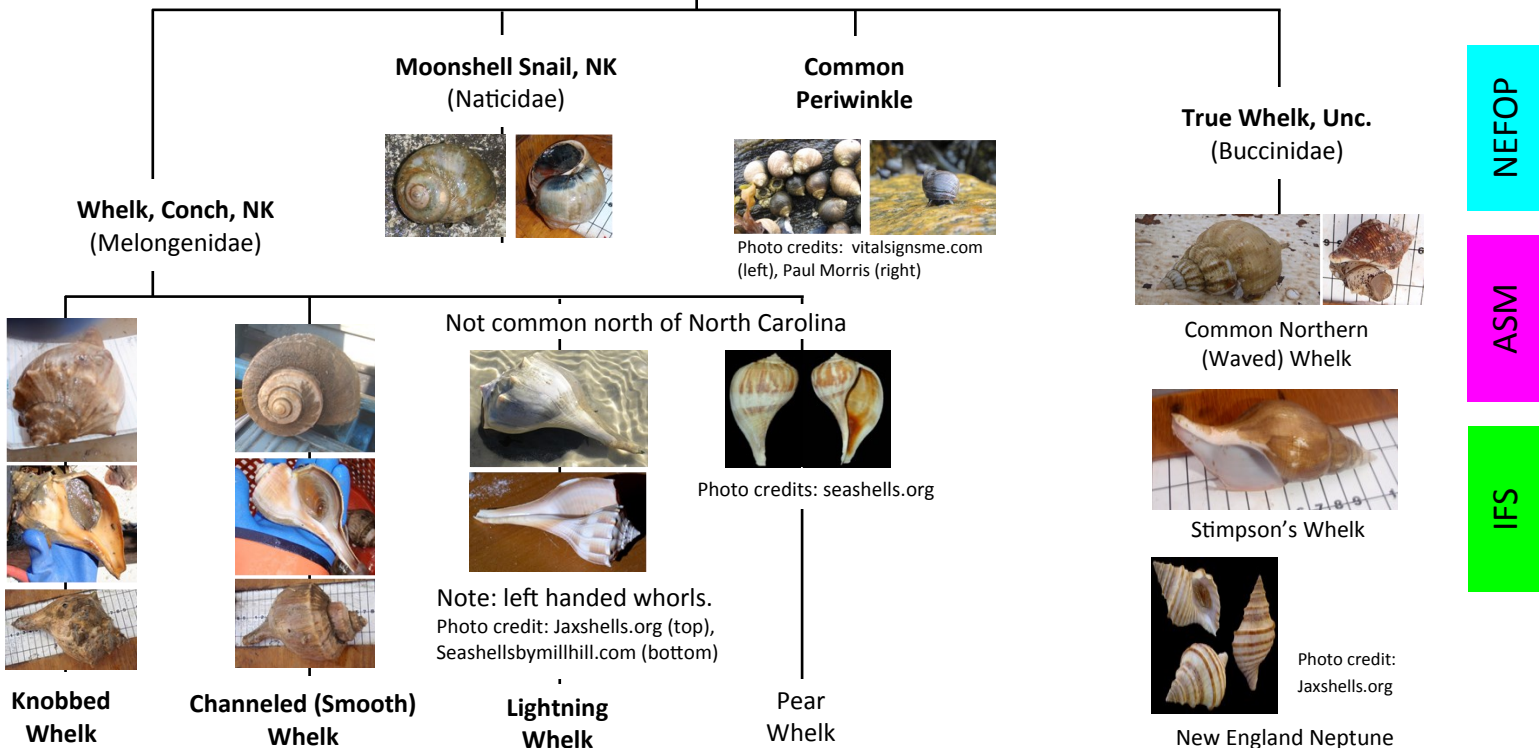
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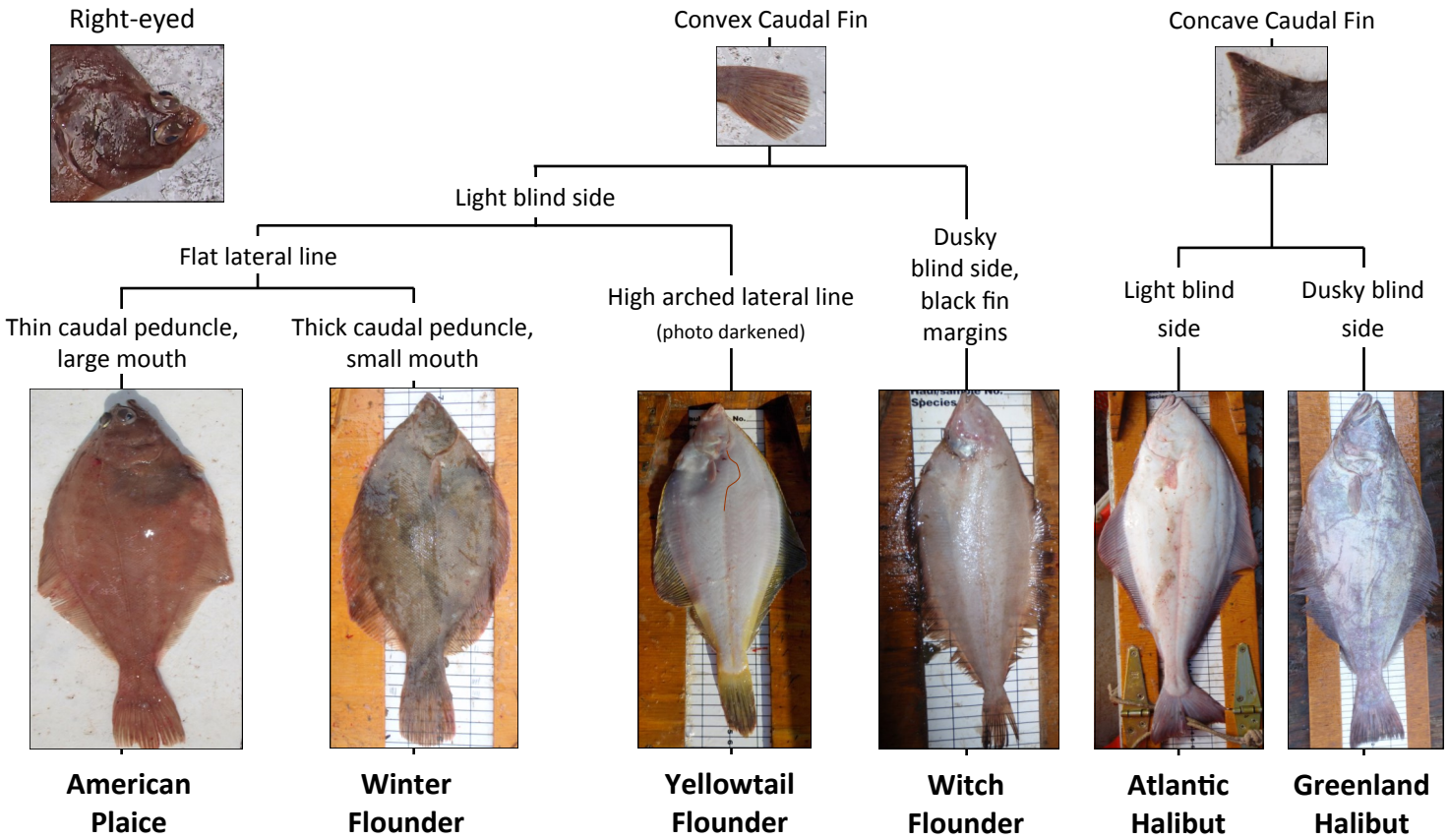




Snail, NK
(record as Gastropoda)

Names in **bold** have species codes. For other species, look up the chart to next highest bolded name.



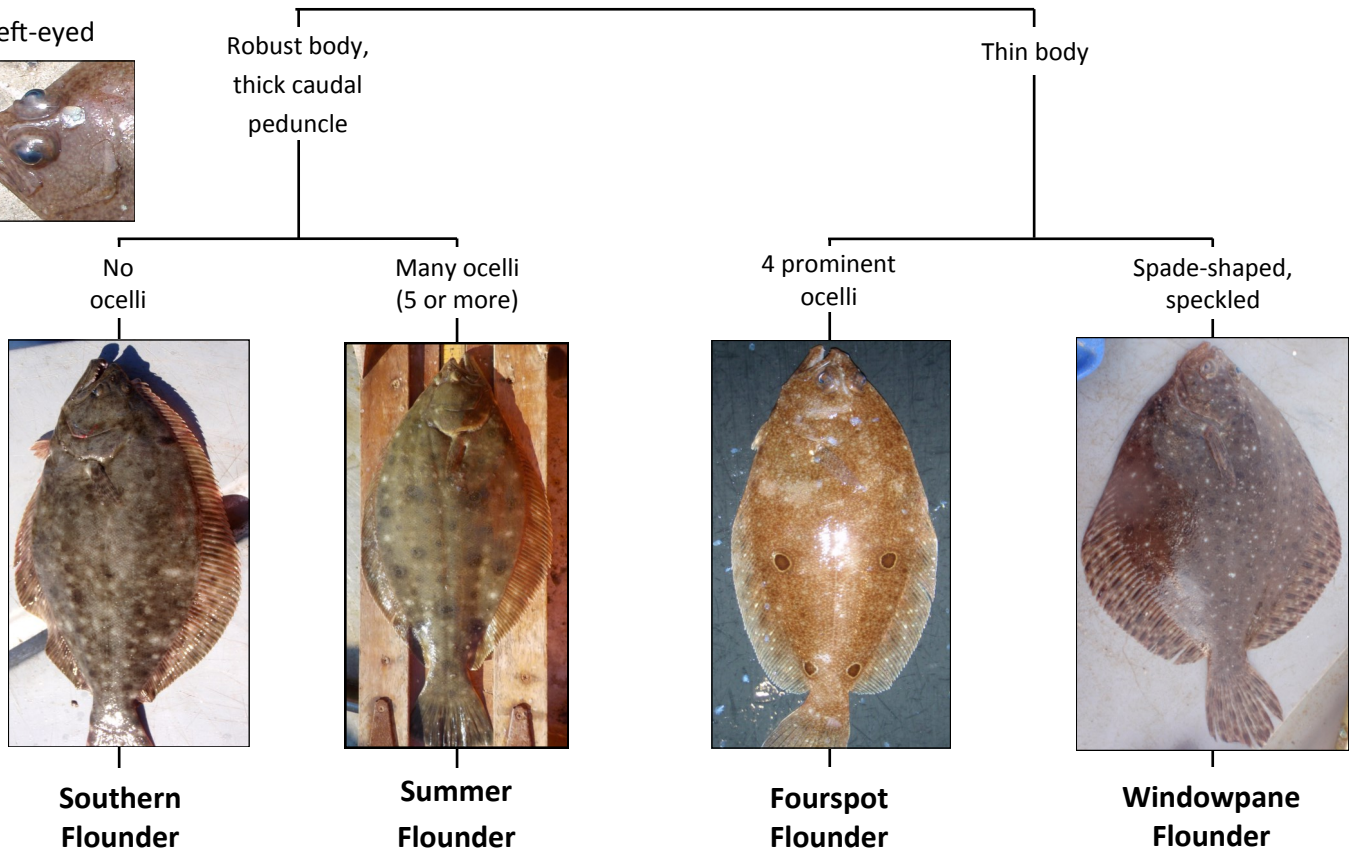


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Left-eyed



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