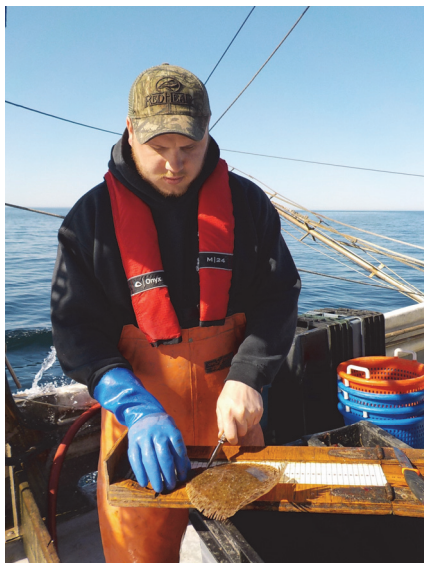


NORTHEAST FISHERIES SCIENCE CENTER FISHERIES SAMPLING BRANCH OBSERVER ON-DECK REFERENCE GUIDE 2020



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

OBSERVER DUTIES OVERVIEW

1

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 age samples, depending on trip type)
 - Collect photos and/or samples for ID verification

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

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

- Actual weights of discarded groundfish.
If actual weights are not possible, tally or basket count are next preferred methods.
- Weights of all other discarded catch, using most accurate method possible.
- 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.
- Length frequencies of discarded groundfish.
- Length frequencies of kept groundfish.
- Length frequencies of other species (as listed in the priority tables).
- While taking weights and length frequencies, photograph species for ID verification
- *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.
- *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 its 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

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. FSB manages at-sea human observing, at-sea electronic monitoring (EM), and shore-side sampling programs.



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.

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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.

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

NEFOP	Northeast Fisheries Observer Program
ASM	At-Sea Monitoring Program for multispecies groundfish
IFS	Industry Funded Scallop Program
HVF	High Volume Fisheries includes Industry Funded Monitoring (IFM)*

*HVF ASM assumed to follow HVF protocols, unless otherwise noted

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DEFINITIONS

5

Observed Haul: A haul for which weights are collected for all species, both kept and discarded. This includes everything brought up in the gear: vertebrate and invertebrate animals, rocks, plants, and debris. See the Operations Manual for specific examples.

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.

Always 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 (groundfish and HVF): only length frequencies are collected.

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. These should be taken as a guide, with adjustments made for haul duration and frequency, observer health and fatigue, and weather/safety concerns.

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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 7), 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

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)

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.

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BIOLOGICAL SAMPLING REQUIREMENTS BY SPECIES

7

Targets per statistical area, for kept and discard separately.

SPECIES NAME	LENGTHS		SEX	SAMPLES
Alewife	100	FL	-	-
Bass, Striped	100	FL	-	-
Bluefish	100	FL	-	25 Otoliths
Butterfish	100	FL	-	20 Otoliths*
Clam, Surf	30 [†]	SW	-	-
Cod, Atlantic	100	FL	-	20 Otoliths
Crab, NK [‡]	200	CW	YES	-
Croaker, Atlantic	50	TL	-	-
Cusk	100	TL	-	20 Otoliths
Dogfish, Spiny	200	TL	YES	-
Drum, Black	50	FL	-	-
Drum, Red	50	FL	-	-
Flounder, American Plaice	100	TL	-	20 Otoliths
Flounder, Summer	100	TL	-	20 Otoliths
Flounder, Windowpane	100	TL	-	20 Otoliths
Flounder, Winter	100	TL	-	20 Otoliths
Flounder, Witch	100	TL	-	20 Otoliths
Flounder, Yellowtail	100	TL	-	20 Otoliths
Haddock, Large (>56 cm)	100	FL	-	20 Otoliths
Haddock, Scrod (48-56 cm)	50	FL	-	20 Otoliths
Haddock, Small (<48 cm)	50	FL	-	20 Otoliths
Hagfish	100	TL	-	-
Hake, Red	100	TL	-	20 Otoliths
Hake, Silver	100	FL	-	20 Otoliths
Hake, White	100	TL	-	20 Otoliths
Halibut, Atlantic	100	TL	-	20 Otoliths

SPECIES NAME	LENGTHS		SEX	SAMPLES
Herring, Atlantic	50	FL	-	-
Herring, Blueback	100	FL	-	-
Lobster, American ^α	200	CL	YES	-
Mackerel, Atlantic	100	FL	-	20 Otoliths*
Mackerel, Spanish	100	FL	-	-
Menhaden	50	FL	-	-
Monkfish (≥40 cm)	100	O	-	-
Monkfish (<40 cm)	100	O	-	-
Ocean Pout	100	TL	-	-
Pollock	100	FL	-	20 Otoliths
Quahog, Ocean	30 [†]	SW	-	-
Redfish, NK	100	FL	YES	20 Otoliths
Scallop, Sea	100	SH	-	-
Scup	100	FL	-	20 Otoliths
Sea Bass, Black	100	TL	-	20 Otoliths
Shad, American	100	FL	-	-
Skate, NK [‡]	100	TL	-	-
Spot	100	FL	-	-
Squid, Atlantic Long-fin	100	ML	-	-
Squid, Short-fin	100	ML	-	-
Tautog	100	TL	-	-
Tilefish	100	FL	-	20 Otoliths [§]
Weakfish	100	FL	-	-
Whelk, NK [‡]	100	SW	-	-
Wolffish, Atlantic	100	TL	-	20 Otoliths

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- * 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
- α Pot/Trap fisheries only

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

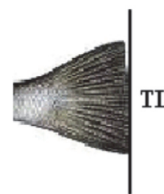
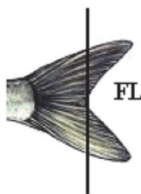
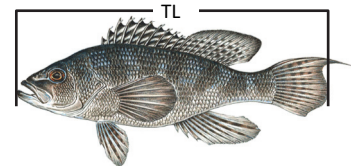
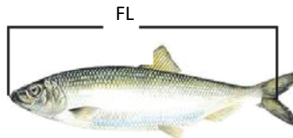
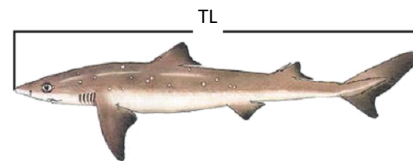
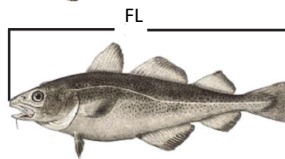
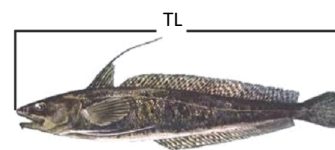
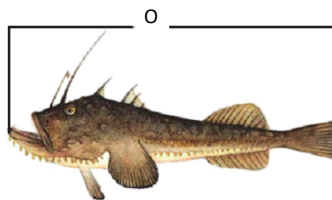
ML = Mantle Length, cm

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)



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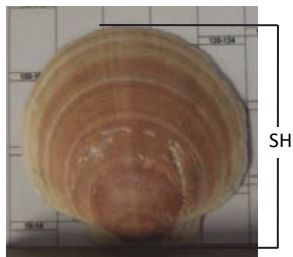
ASM

IFS

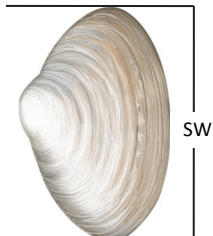
LENGTH MEASUREMENT ILLUSTRATIONS

9

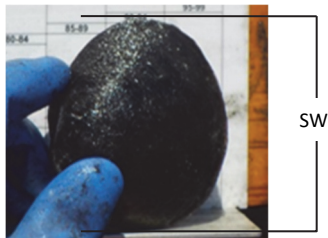
Scallop Shell Height (mm)



Clam Shell Width (mm)

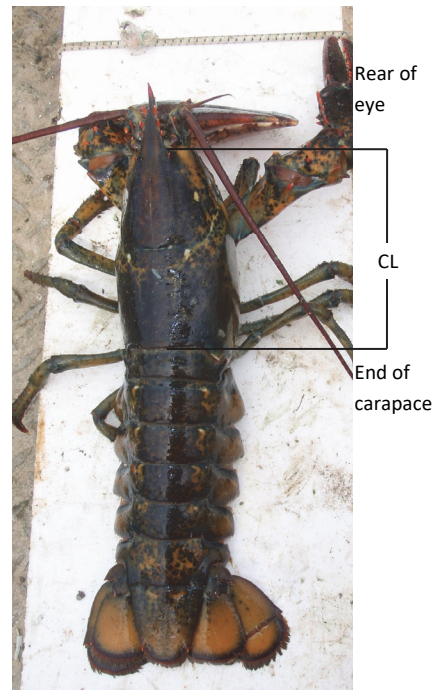


Surf Clam

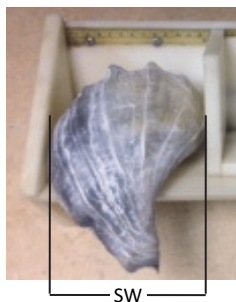


Quahog

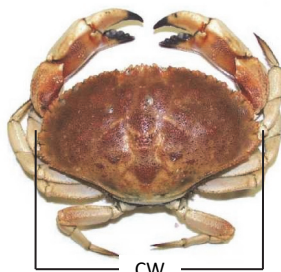
Lobster Carapace Length (mm)



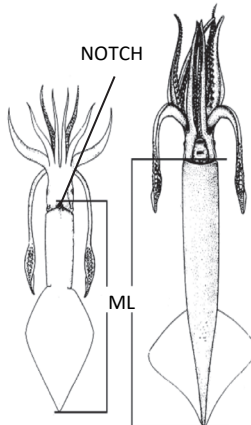
Whelk Shell Width (mm)



Crab Carapace Width (mm)



Squid Mantle Length (cm)



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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)

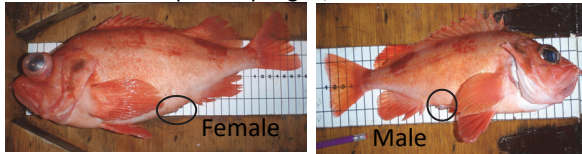


Redfish

Squeeze body slightly near pelvic fin

Females: No external copulatory organ; orange eggs

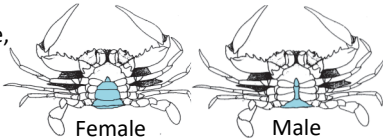
Males: External copulatory organ; white milt



Crabs

Females: Abdomen wide, "U" shaped

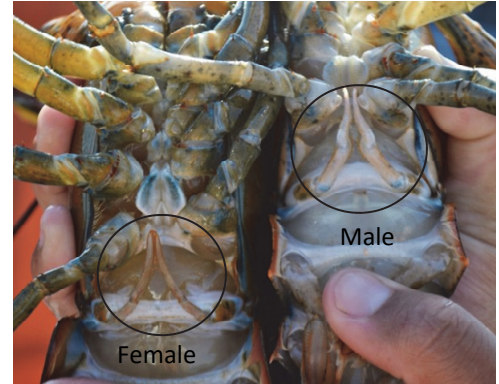
Males: Abdomen thin, "V" shaped



Lobsters

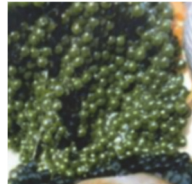
Females: First pair of swimmerets soft, feathery, bendable, flat. Large genital opening on 3rd pair of walking legs

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



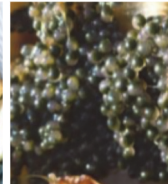
Lobster Egg Stages

Newly Extruded



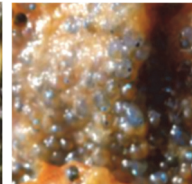
Uniform color, no eye spots visible.

Eyed



Start as black specks, turn turquoise, then red/brown.

Hatching



Blue appearance with brown fibrous material.

Spent



Furry appearance of the setae.

SPECIES VERIFICATION PROGRAM REQUIREMENTS

11

Send in actual specimens and/or photographs of the following species each calendar 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)	dorsal fin with filament	rakers above 'elbow' of first arch
White Hake	whole animal (side shot)	dorsal fin with filament	rakers above 'elbow' of first arch
Silver Hake	whole animal (side shot)	all rakers on first gill arch (arch removed from gill cavity)	
Offshore Hake	whole animal (side shot)	all rakers on first gill arch (arch removed from gill cavity)	

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 near vent 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 near vent or claspers	

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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 (peritoneum)	lower jaw slope (angle) into mouth
Blueback	whole animal (side shot)	gut lining (peritoneum)	lower jaw slope (angle) into mouth
Am. Shad	whole animal (side shot)	rakers on first gill arch	lower jaw slope (angle) into mouth
Hickory Shad	whole animal (side shot)	rakers on first gill arch	lower jaw slope (angle) into mouth
Atl. Herring	whole animal (side shot)		
Atl. Menhaden	whole animal (side shot)		

Additional photo requirements for every trip

High Volume and herring trips: all herrings listed above *plus* Atlantic Thread Herring, Atlantic Mackerel, and Chub Mackerel (minimum of whole animal, side shot of each)

Scallop trips: yellowtail flounder, both scallop dredges

Lobster trips: lobster egg stages

Any unknown ID (Fish NK): also submit whole sample when possible

Damaged by sharks or marine mammals: any animal

Always include something in each picture for scale.

Quarters

Jan - Mar

Apr - Jun

Jul - Sep

Oct - Dec



American shad with seal damage

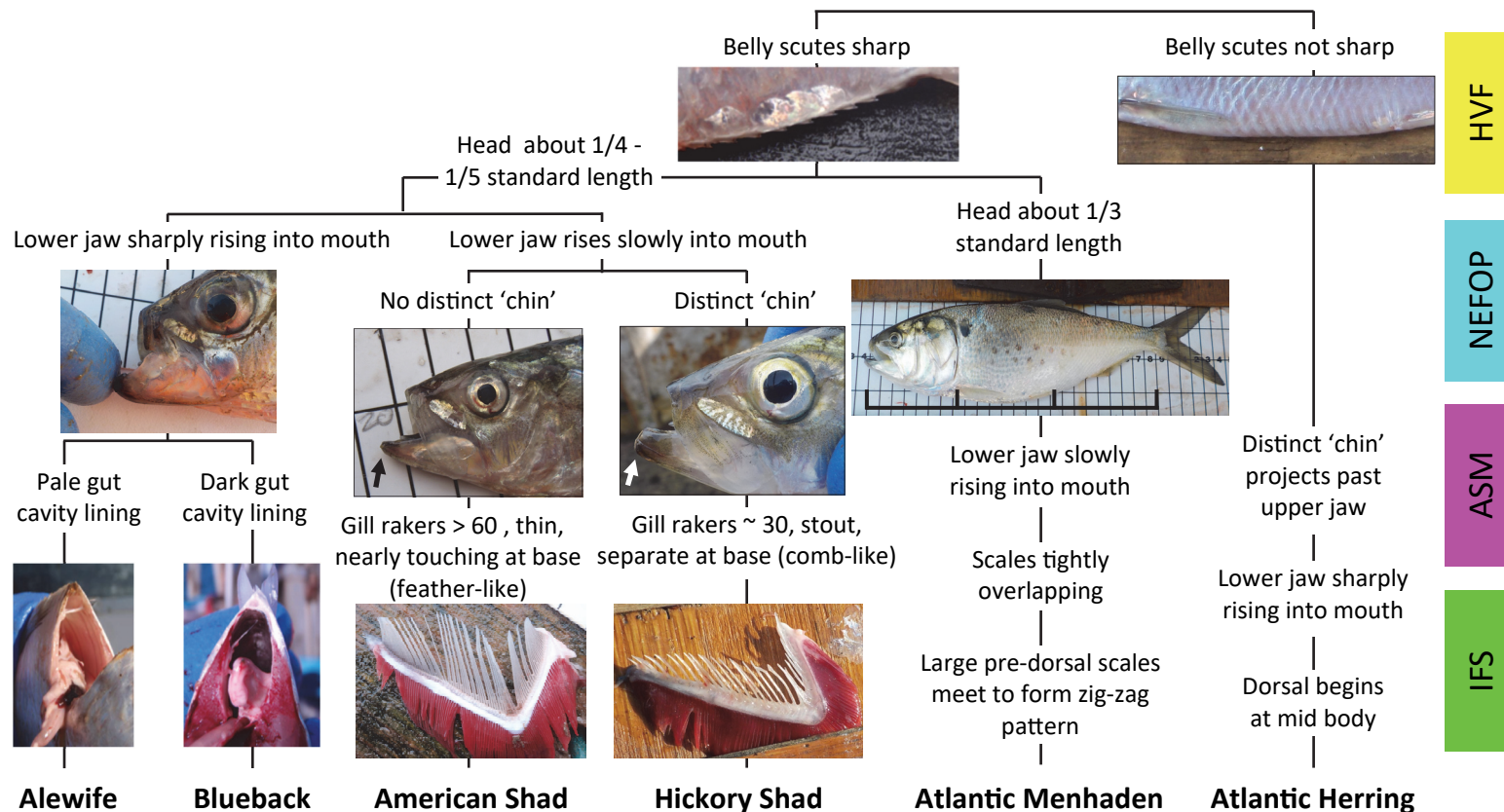
SPECIES VERIFICATION PROGRAM REQUIREMENTS

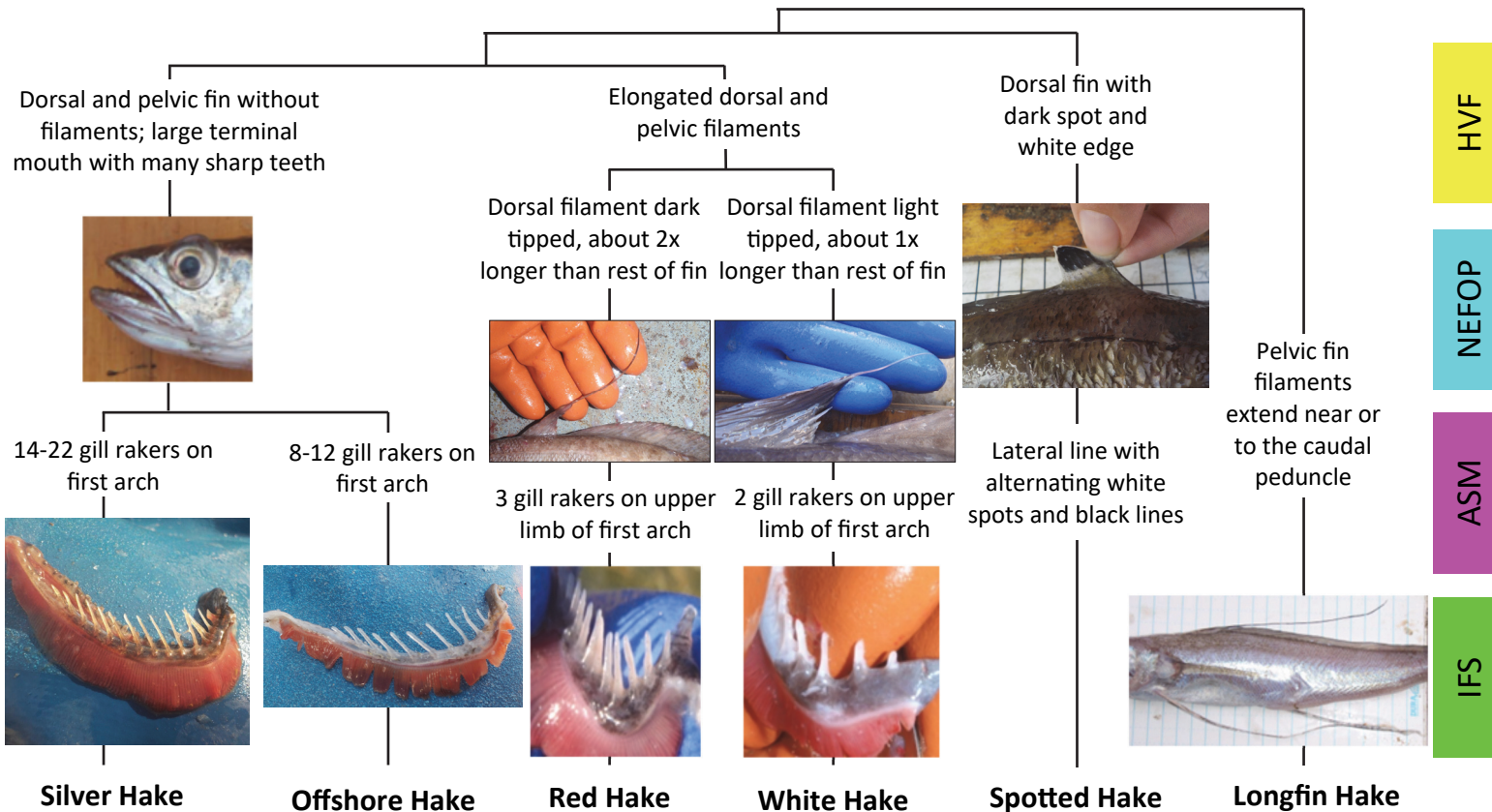
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Sexual Maturity

Males: calcified claspers extending beyond pelvic fins



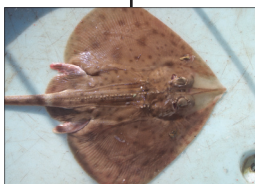
Females: patches of tiny spines beside vent that are rough to touch



Single mid-dorsal row of spines

Tail with 3 distinct rows of spines

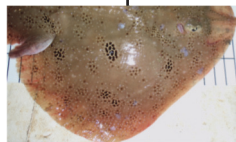
Low central row of uniform spines on disc with a raised ridge on each side



Large, widely spaced, thorn-like spines down mid-dorsal and tail



Distinct starburst or 'rosette' pattern



Dark underside, no obvious spines in middle of back, spines present along sides of tail



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Multiple rows of spines on tail (7+)

≥35cm

<35cm

Sexually mature >60cm

Sexually mature at 35-56cm

Winter Skate

Little Skate

Little/Winter Skate NK

Smooth Skate

Clearnose Skate

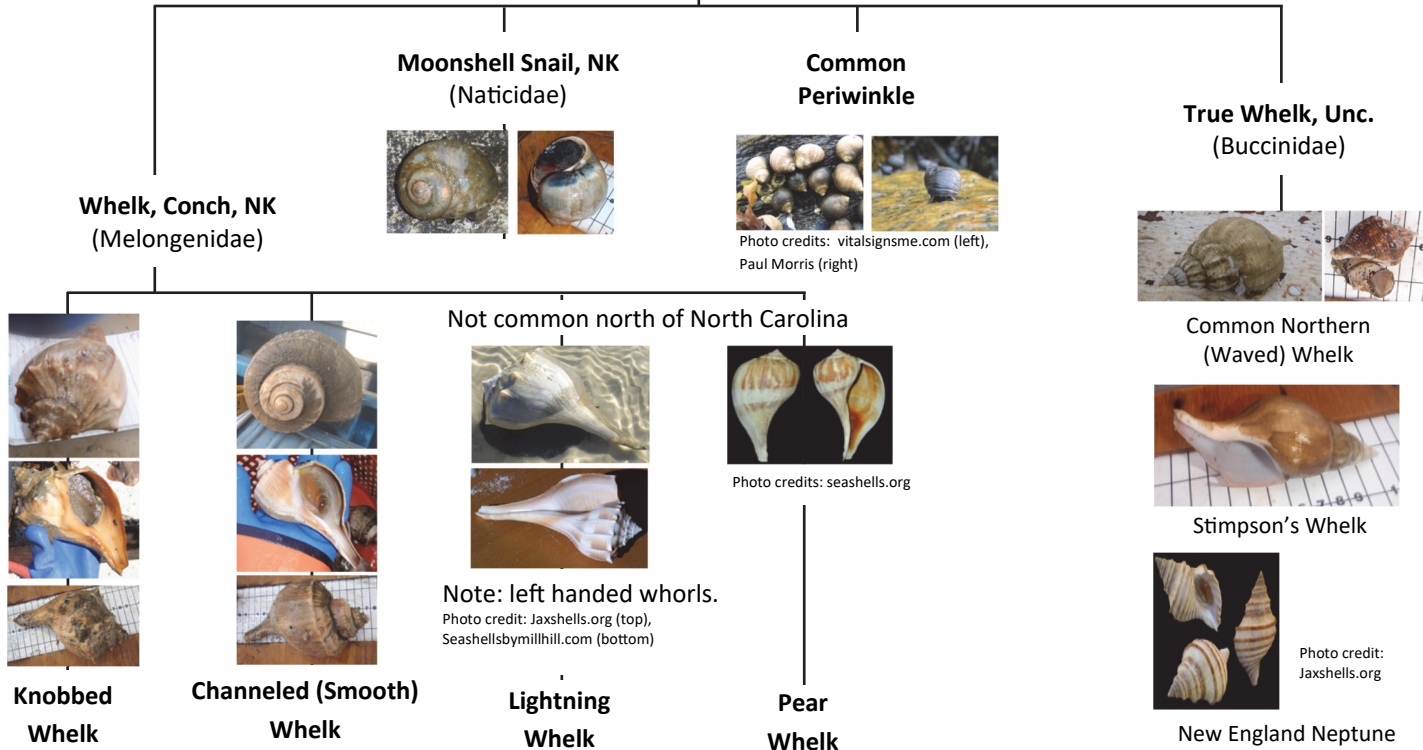
Rosette Skate

Thorny Skate

Barndoor Skate

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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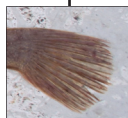
IDENTIFICATION KEY FOR COMMON FLOUNDERS

17

Right-eyed



Convex Caudal Fin



Concave Caudal Fin



Light blind side

Flat lateral line

**High arched lateral line
(lateral line shown in red)**

**Dusky blind side,
black fin margins,
flat lateral line**

**Light blind
side, arched
lateral line**

**Dusky blind
side, flat
lateral line**

**Large mouth, thin
caudal peduncle**

**Small mouth, thick
caudal peduncle**



**American
Plaice**

**Winter
Flounder**

**Yellowtail
Flounder**

**Witch
Flounder**

**Atlantic
Halibut**

**Greenland
Halibut**

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Left-eyed



Thick body,
thick caudal
peduncle

No ocelli



**Southern
Flounder**

Many ocelli
(5 or more)



**Summer
Flounder**

Thin body

4 prominent ocelli,
eyes close-set



**Fourspot
Flounder**

Spade-shaped,
speckled, spots
onto fins



**Windowpane
Flounder**

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Fixed gears are those that are set to soak in a particular area, typically unattached 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)



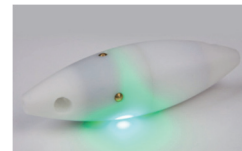
AIRMAR



FISHTEK



FUMUNDA



FUTURE OCEANS LED

Anchors

Dead Weight



Chain



Railroad Track



Mushroom

Danforth-Style (Burying Anchor)



Other



Kedge



Grapnel



Claw Hook

Additional Weights

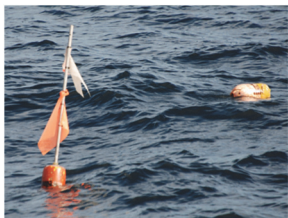
- NOT anchors
- Used on the leadline
- Do not combine the weight of the leadline with additional weights.



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



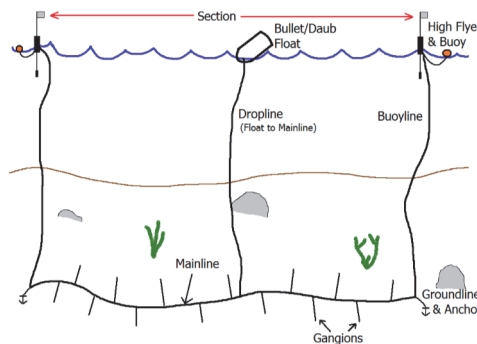
Buoyline Marks

- 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)



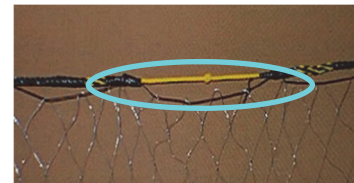
Off-the Shelf



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



Rope of Appropriate Breaking Strength



Overhand Knot/Jumper Line

GILLNET AND BEACH SEINE SAMPLING PRIORITIES

21

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)

Priority 1

Alewife

Cod, Atlantic

Cusk

Flounder, Winter

Flounder, Witch (LF)

Haddock

Hake, White

Halibut, Atlantic

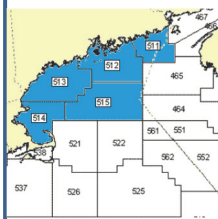
Herring, Blueback

Monkfish

Pollock

Shad, American

Wolffish, Atlantic



Priority 2

Bass, Striped

Dogfish, Spiny

Flounder, Am. Plaice

Flounder, Witch (AS K)

Flounder, Yellowtail (LF)

Hake, Silver

Redfish

Skate, Barndoor (D)

Skate, Little

Skate, Thorny (D)

Skate, Winter

Priority 3

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)

Priority 1

Cod, Atlantic

Cusk

Haddock

Hake, White

Halibut, Atlantic

Monkfish

Pollock

Wolffish, Atlantic

Priority 2

Dogfish, Spiny

Flounder, Am. Plaice

Flounder, Witch

Hake, Silver

Redfish

Skate, Barndoor (D)

Skate, Little

Skate, Smooth

Skate, Thorny (D)

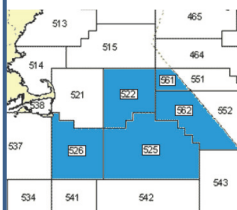
Skate, Winter

Priority 3

Bluefish (LF KD, AS D)

Hake, Red

Skate, Rosette

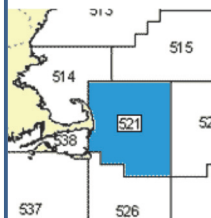


NEFOP

ASM

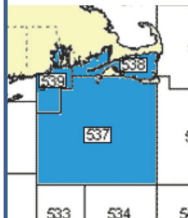
Cape Cod (Statistical area 521)

<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



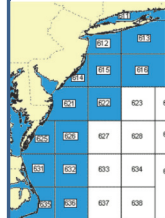
Southern New England (Statistical areas 537-539)

<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	Mackerel, Atlantic
Flounder, Winter	Mackerel, Spanish
Flounder, Yellowtail (LF)	Menhaden, Atlantic
Herring, Blueback	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



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

All areas

Priority 1

Cusk (LF)

Hagfish

Lobster, American

Other Fish*

Wolffish

Priority 2

Crab, Jonah

Crab, Red

Crab, Rock

Cusk (AS)

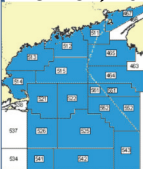
* Any other commercially important species, such as: striped bass, bluefish, butterfish, cod, dogfish, flounders, haddock, hakes, herring, shads, mackerels, monkfish, ocean pout, pollock, redfish, scup, black sea bass, skates, squids, tautog, and tilefish.

Bottom Longline

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

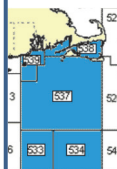
Gulf of Maine and Georges Bank (Statistical areas 464, 465, 467, 511-515, 521, 522, 525, 526, 541-543, 561, 562)

<u>Priority 1</u>	<u>Priority 2</u>
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)



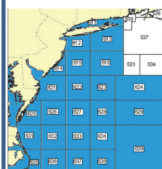
Southern New England (Statistical areas 533, 534, 537-539)

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

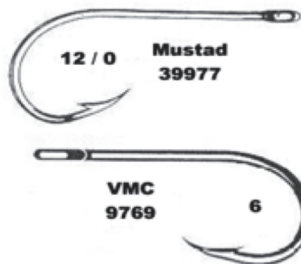


Mid-Atlantic (Statistical areas 611-616, 621-629, 631-639)

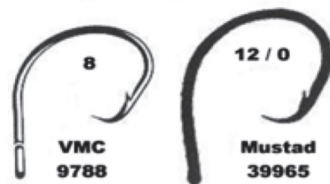
<u>Priority 1</u>
Flounder, Summer
Monkfish
Tilefish
<u>Priority 2</u>
Hake, Red (LF)
Skate, nk
<u>Priority 3</u>
Hake, Red (AS)



PARTIAL CIRCLE HOOKS



CIRCLE HOOKS



*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

BOTTOM LONGLINE SAMPLING PRIORITIES

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

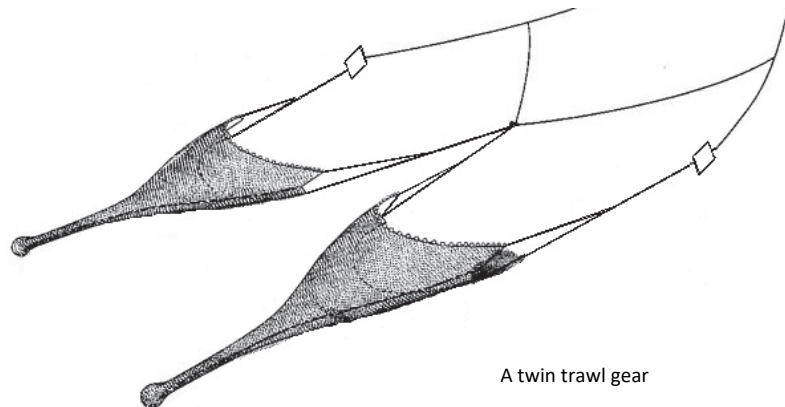
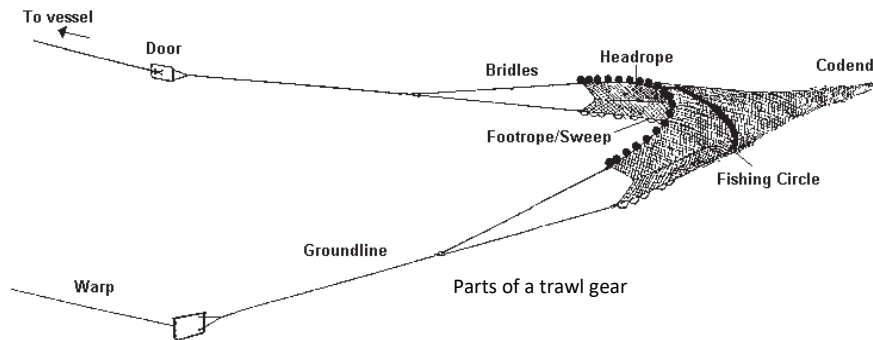
Common features:

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

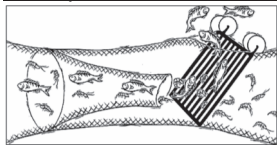
On dredges, the frame provides a fixed opening, while the cutting bar stirs up benthic creatures.

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.

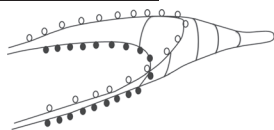
Catch is collected at the end of the gear, in a codend, chain bag, or bunt. Catch is often dumped into checker pens or on deck for sorting.



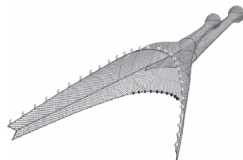
Examples of Excluder/Separator Devices



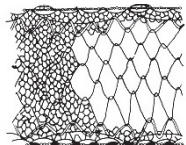
Grate / Guiding Device



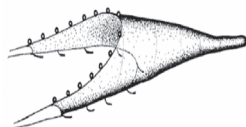
Headrope longer than footrope



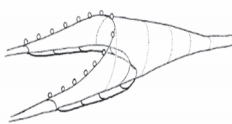
Separator Panel



Large Mesh



Sweepless Raised Footrope

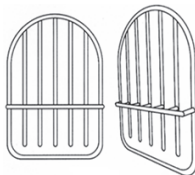


Raised Footrope

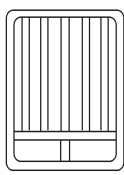
Examples of Turtle Excluder Devices (T.E.D.)



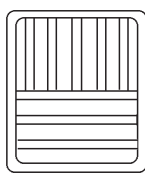
Standard



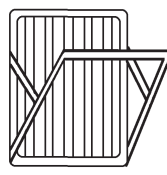
Weedless



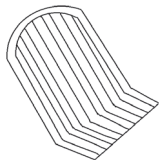
Conch



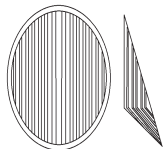
Flounder



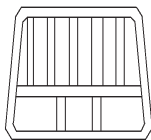
Fixed Angle



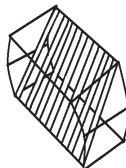
Bent Pipe



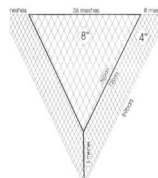
Bent Rod



Whelk



Hoopd



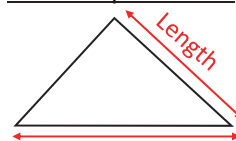
Parker Soft

Examples of Escape Outlets

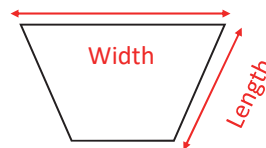
- Section of large meshes
- Opening or hole allowing non-target fish to exit

Must have an excluder or separator present

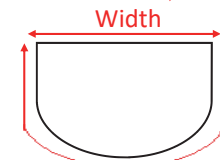
Measuring Bycatch Reduction Devices and Escape Outlets



Width



Width



Length

Length = Front to back of net (mouth to codend)

Width = Seam to seam

HVF

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ASM

IFS

COMMUNICATION POINTS FOR IDENTIFYING TRAWL GEARS

27


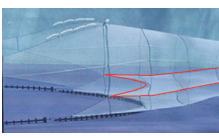
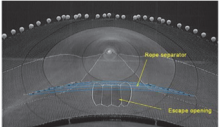

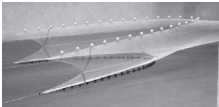

Raised Footrope Trawl	<ul style="list-style-type: none"> No ground gear on the sweep (bare wire or chain sweep) Drop chains at least 42 inches long
Sweepless Trawl	<ul style="list-style-type: none"> No sweep attached to drop chains Drop chains at least 42 inches long
Balloon Trawl	<ul style="list-style-type: none"> High mouth, high-rise net Lighter net material and floats help net fish just off the bottom
Box Trawl	<ul style="list-style-type: none"> Always 4-seam Box-shaped, high rise net
Flynet	<ul style="list-style-type: none"> High profile net Headrope slightly longer than footrope 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 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 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 May have kite panels
Monkfish Trawl	<ul style="list-style-type: none"> Large wing extensions 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 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

HVF

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IFS

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 <p>• Vertical lines may be used to maintain the shape of the escape outlet If possible, comment on distance between ropes in separator panel and take photos</p>
Flounder Trawl (050)	<p>Location of 12"</p>  <p>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 footrope, 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) <p>• Panel goes all the way from one bottom gore to the other • Panel is 3 meshes deep (~90")</p>

COMMUNICATION POINTS FOR IDENTIFYING TRAWL GEARS

Scallop Dredge and Scallop Trawl

- *Day trips*: observe every haul
- *Multiday trips*: observe at least 50% of hauls
 - All hauls during on-watch hauls should be observed
- 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

Priority 1

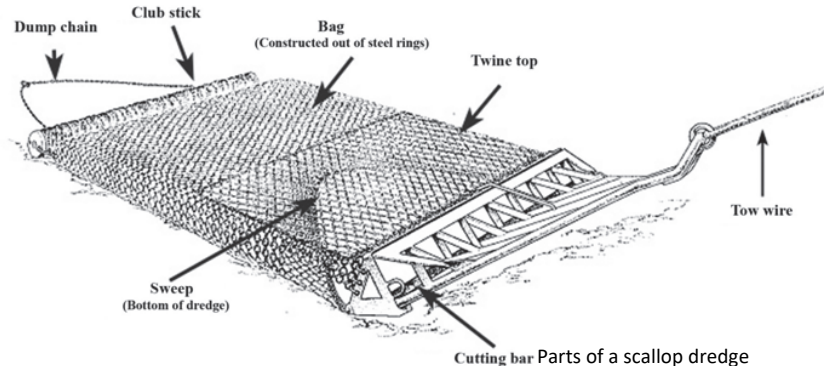
Flounder, Summer
Flounder, Windowpane (LF)
Flounder, Winter
Flounder, Yellowtail (LF)
Monkfish
Scallop, Sea

Priority 2

Cod, Atlantic
Flounder, Windowpane (AS)
Skate, Barndoor (D)

Priority 3

Flounder, Yellowtail (AS)
Ocean Pout
Skate, nk



All Bottom Trawls

- *Day trips*: observe every haul
- *Multiday trips*: 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 31-32

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

Priority 1

Alewife

Cod, Atlantic

Flounder, Am. Plaice

Flounder, Winter

Flounder, Witch

Flounder, Yellowtail (LF)

Haddock

Herring, Blueback

Monkfish

Ocean Pout

Pollock

Redfish, nk

Shad, American

Wolffish, Atlantic (LF)

Priority 2

Flounder, Windowpane

Hake, Silver

Hake, White

Herring, Atlantic

Skate, Barndoor (D)

Skate, Little

Skate, Thorny (D)

Skate, Winter

Wolffish, Atlantic (AS)

Priority 3

Flounder, Yellowtail (AS)

Hake, Red

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

Priority 1

Clam, Surf

Flounder, Summer

Quahog, Ocean

Scallop, Sea

Priority 2

Flounder, Yellowtail (LF)

Monkfish

Skate, Barndoor (D)

Priority 3

Flounder, Yellowtail (AS)

Skate, nk

BOTTOM OTTER TRAWL SAMPLING PRIORITIES

31

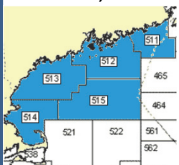
HVF

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ASM

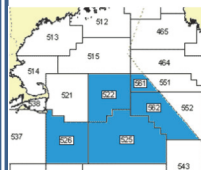
Gulf of Maine (Statistical areas 511-515)

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



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

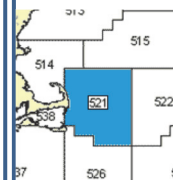
<u>Priority 1</u>	<u>Priority 2</u>
Cod, Atlantic	Butterfish
Cusk	Dogfish, Spiny
Flounder, Summer	Flounder, Am. Plaice
Flounder, Winter	Flounder, Windowpane
Flounder, Yellowtail (LF)	Flounder, Witch
Haddock	Hake, Silver
Hake, White	Herring, Atlantic
Halibut, Atlantic	Ocean Pout
Monkfish	Redfish, nk
Pollock	Skate, Barndoor (D)
Wolffish, Atlantic	Skate, Little



<u>Priority 3</u>
Bluefish (LF KD, AS D)
Flounder, Yellowtail (AS)
Hake, Red
Squid, Atl. Long-fin
Squid, Short-fin

Cape Cod (Statistical area 521)

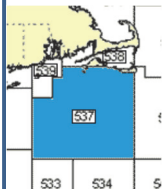
<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Bass, Striped
Cod, Atlantic	Flounder, Windowpane
Cusk	Flounder, Witch
Flounder, Summer	Haddock (K)
Flounder, Winter	Hake, Silver
Flounder, Yellowtail (LF)	Herring, Atlantic
Haddock (D)	Ocean Pout
Hake, White	Redfish, nk
Herring, Blueback	Skate, Barndoor (D)
Monkfish	Skate, Little
Pollock	Skate, Smooth
Shad, American	Skate, Thorny (D)
Wolffish, Atlantic	Skate, Winter



<u>Priority 3</u>
Bluefish (LF KD, AS D)
Butterfish
Flounder, Am. Plaice
Flounder, Yellowtail (AS)
Hake, Red
Mackerel, Atlantic
Tautog

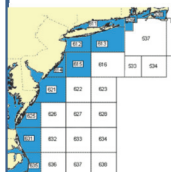
Southern New England (Statistical area 537)

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Bass, Striped
Butterfish	Cod, Atlantic
Flounder, Summer	Dogfish, Spiny
Flounder, Winter	Flounder, Windowpane
Flounder, Yellowtail (LF)	Hake, Silver
Herring, Blueback	Herring, Atlantic
Monkfish	Mackerel, Atlantic
Scup	Ocean Pout
Sea Bass, Black	Skate, Barndoor (D)
Shad, American	Skate, Little
Squid, Atl. Long-fin	Skate, Thorny (D)
	Skate, Winter
	Squid, Short-fin
	<u>Priority 3</u>
	Bluefish (LF KD, AS D)
	Flounder, Yellowtail (AS)
	Hake, Red
	Skate, Clearnose
	Skate, Rosette
	Skate, Smooth
	Tautog



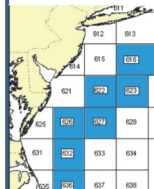
Mid-Atlantic inshore (Statistical areas 538, 539, 611-615, 621, 625, 631, 635)

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Butterfish
Bass, Striped	Herring, Atlantic
Bluefish (LF KD, AS D)	Mackerel, Atlantic
Dogfish, Spiny	Ocean Pout
Flounder, Summer	Skate, Clearnose
Flounder, Windowpane	Skate, Little
Flounder, Winter	
Flounder, Yellowtail (LF)	<u>Priority 3</u>
Herring, Blueback	Croaker, Atlantic
Monkfish	Drum, Black
Scup	Drum, Red
Sea Bass, Black	Flounder, Yellowtail (AS)
Shad, American	Mackerel, Spanish
Squid, Atl. Long-fin	Menhaden, Atlantic
Squid, Short-fin	Spot
Weakfish	Tautog



Mid-Atlantic offshore (Statistical areas 616, 622, 623, 626, 627, 632, 636)

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Butterfish
Flounder, Summer	Dogfish, Spiny
Herring, Atlantic	Flounder, Windowpane
Herring, Blueback	Hake, Silver (LF)
Monkfish	Ocean Pout
Scup	Skate, Barndoor (D)
Sea Bass, Black	Skate, Clearnose
Shad, American	Skate, Little
Squid, Atl. Long-fin	Skate, Rosette
Squid, Short-fin	Skate, Smooth (D)
	Skate, Thorny (D)
	<u>Priority 3</u>
	Bluefish (LF KD, AS D)
	Hake, Red
	Hake, Silver (AS)
	Scallop, Sea
	Skate, Smooth (K)
	Skate, Winter
	Weakfish



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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	
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

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.

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Area Calculations

V = Volume

L = Length

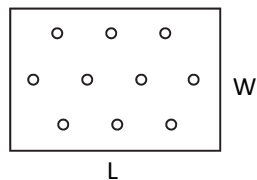
W = Width

D = Depth

$\pi = 3.14$

o = suggested locations to
take depth measurements

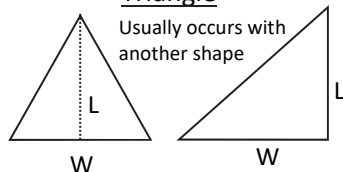
Rectangle



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

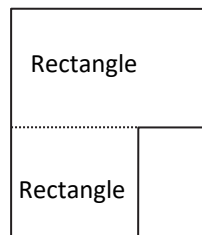
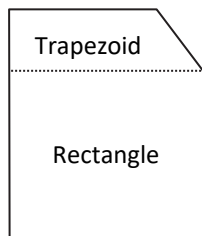
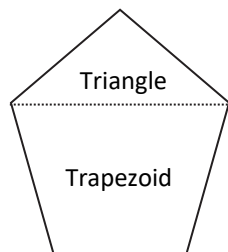
Triangle

Usually occurs with
another shape

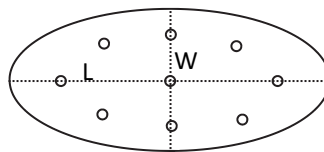


$$V = L \times W \times D \div 2$$

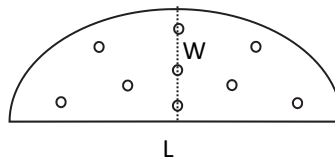
Combination



Oval and Half-Oval

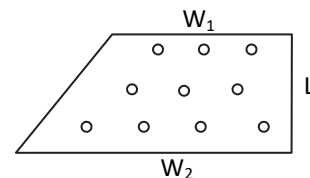
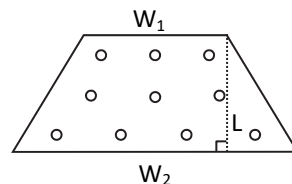


o Include one depth of 0.0ft



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

Trapezoid



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

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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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 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

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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 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

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

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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

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)

$$\begin{array}{rcl} \text{Volume of} & & \text{Total volume} \\ \text{new haul} & = & \text{after new haul} \\ & & \text{dumped} \end{array} \quad \begin{array}{rcl} & & \text{Remainder volume} \\ & - & \text{before new haul} \\ & & \text{dumped} \end{array}$$

- 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



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

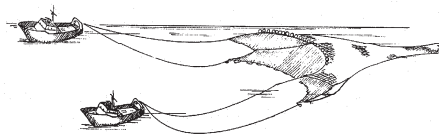
High Volume Fisheries are defined as:

- Any trip where a pump is used to bring catch onboard
- Any bottom otter trawl trip targeting herring, mackerel, or menhaden (regardless of pumping)
- Any purse seine trip (regardless of target species)

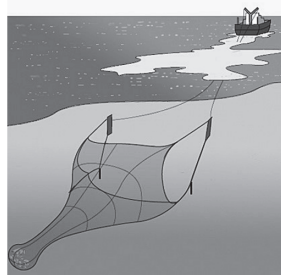
Every haul requires a Discard Log, unless there is no catch (kept or discard).

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

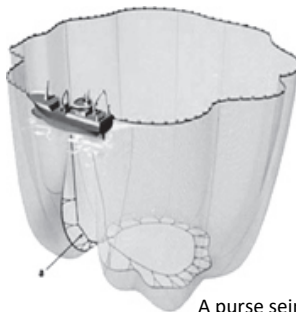
Slippage: Catch that is discarded prior to being observed, sorted, sampled, and/or brought onboard the fishing vessel.



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

Catch Composition method

Used when catch is pumped onboard

Sampling interval = estimated pumping time \div 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.

If pumping ends early, do not try to get more baskets at the end. Keep sampling intervals consistent.

If pumping goes long, empty every even numbered basket and sample at double original interval.

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

Obtain a captain's estimate of the total weight of catch going into the hold.

Ratio = $\frac{\text{total basket weight for individual species}}{\text{total basket weight for all species}}$

Extrapolated weight = species ratio x captain's estimated total

Estimation method = "Catch Composition"

Splitting the bag

Used when catch is hauled onboard in sections or when catch is going directly into the hold

Sampling interval = number of splits

Take 5-10 (if possible) subsample baskets spaced evenly throughout the sorting process.

Sort and weigh baskets by species and disposition, and record the subsample weight on the Haul Log.

Obtain a captain's estimate of the total weight of catch.

Multiplier = Captain's estimated total \div subsample weight

Estimation method = "other" with comment "captain's estimate + weight-to-weight"

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PAIR AND SINGLE MID-WATER TRAWL & PURSE SEINE SAMPLING PRIORITIES

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

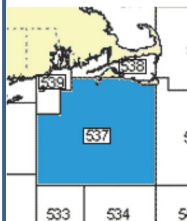


Cape Cod (Statistical area 521)	
<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Flounder, Windowpane
Cod, Atlantic	Haddock (K)
Cusk	Hake, Silver
Flounder, Summer	Redfish, nk
Flounder, Winter	Skate, Barndoor (D)
Flounder, Yellowtail (LF)	Skate, Little
Haddock (D)	Skate, Smooth
Hake, White	Skate, Thorny (D)
Herring, Atlantic	Skate, Winter
Herring, Blueback	Squid, Atl. Long-fin
Mackerel, Atlantic (LF)	Squid, Short-fin
Monkfish	Wolffish, Atlantic (AS)
Pollock	
Shad, American	<u>Priority 3</u>
Wolffish, Atlantic (LF)	Bluefish (LF KD, AS D)
	Butterfish
	Flounder, Yellowtail (AS)
	Hake, Red
	Mackerel, Atlantic (AS)
	Tautog



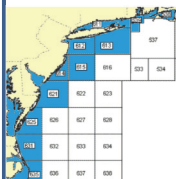
Southern New England (Statistical area 537)

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Cod, Atlantic
Flounder, Summer	Dogfish, Spiny
Flounder, Winter	Flounder, Windowpane
Flounder, Yellowtail (LF)	Hake, Silver
Herring, Atlantic	Mackerel, Atlantic (AS)
Herring, Blueback	Skate, Barndoor (D)
Mackerel, Atlantic (LF)	Skate, Little
Monkfish	Skate, Thorny (D)
Scup	Skate, Winter
Sea Bass, Black	Squid, Short-fin
Shad, American	
Squid, Atl. Long-fin	<u>Priority 3</u>
	Bluefish (LF KD, AS D)
	Butterfish
	Flounder, Yellowtail (AS)
	Hake, Red
	Ocean Pout
	Skate, Clearnose
	Skate, Rosette
	Skate, Smooth
	Tautog



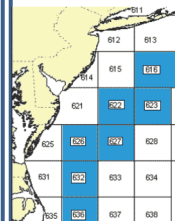
Mid-Atlantic inshore (Statistical areas 538, 539, 611-615, 621, 625, 631, 635)

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



Mid-Atlantic offshore (Statistical areas 616, 622, 623, 626, 627, 632, 636)

<u>Priority 1</u>	<u>Priority 2</u>
Alewife	Dogfish, Spiny
Flounder, Summer	Flounder, Windowpane
Herring, Atlantic	Hake, Silver
Herring, Blueback	Mackerel, Atlantic (AS)
Mackerel, Atlantic (LF)	Skate, Barndoor (D)
Monkfish	Skate, Clearnose
Scup	Skate, Little
Sea Bass, Black	Skate, Rosette
Shad, American	Skate, Smooth (D)
Squid, Atl. Long-fin	Skate, Thorny (D)
	Squid, Short-fin
	<u>Priority 3</u>
	Bluefish (LF KD, AS D)
	Butterfish
	Hake, Red
	Scallop, Sea
	Skate, Smooth (K)
	Skate, Winter
	Weakfish



Sampling for Each Animal

1. Photograph, including something for scale
2. Weigh or visually estimate
3. Measure lengths (see pages 43-44)
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	
Grouper	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.

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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).

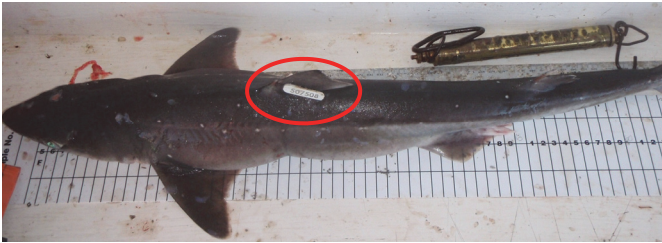
Record the following information:

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.



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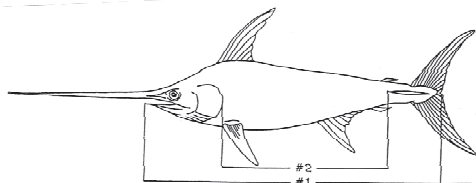
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Length Measurements by Species/Group

Swordfish



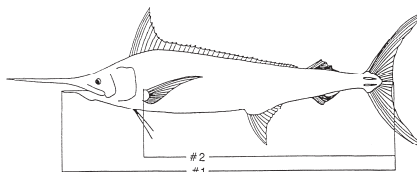
Measurements

- #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



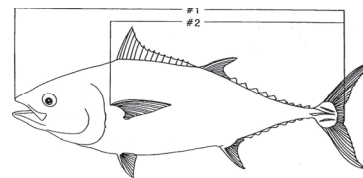
Measurements

- #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

NOTE: All measurements straight unless otherwise noted.

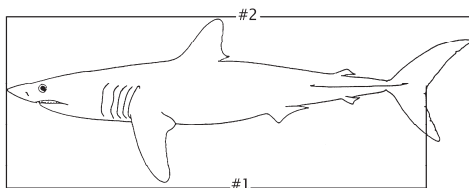
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Sharks



Measurements

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

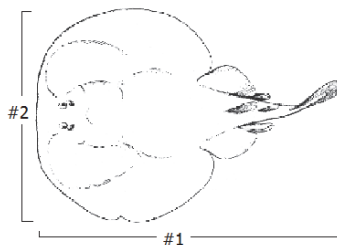
Photographs to Take

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

Dogfish

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

Rays and Stingrays



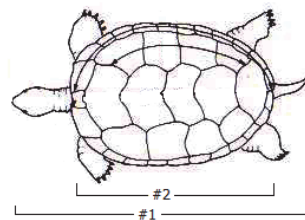
Measurements

- #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

Other IAL Species

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:

Fin Clip

1. Using a CLEAN knife, cut a 1/4 cm square sized piece of pelvic fin, place it into a vial of RNALater (one vial per fish).

Note: The volume of the RNALater solution to tissue sample should be approximately 5 times the volume of the tissue sample. If needed, clip a larger piece of pelvic fin and then trim an appropriately sized tissue sample for the RNALater vial.

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 may be stored at room temperature and mailed in with trip logs.

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.

Other important notes

- Only take a biological sample from Atlantic sturgeon or "sturgeon nk." If you have positively identified the species as shortnose sturgeon (*Acipenser brevirostrum*), do not biologically sample them. **Always** include appropriate photos for positive ID.
- Do not bring any sturgeon back to shore.



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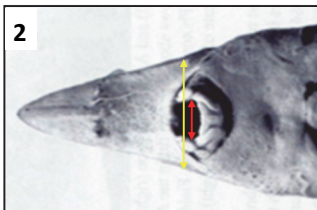
IFS

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.

Atlantic Sturgeon

Max Length: over 9'

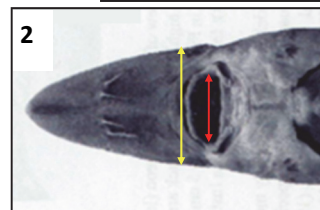
1. Post-dorsal fin plates above lateral plates
2. Width inside lips <60% interorbital width
3. 2-6 rows of bony plates between base of anal fin and lateral row of plates
4. More complex/paired post anal scutes
5. "Soft spot" on the head between dermal plates (raised) on skull



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"



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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

Marine Mammal Samples

Minimum sampling requirements should always be completed.

Whole animals should be collected whenever possible. If the whole animal can be collected, do not cut body for blubber measurement. Required DNA sample from hind flipper should still be taken and submitted.

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

- Blubber (from blubber measurement location)
- Whiskers (3 longest, cut entire cheek, pinnipeds only)
- Fetus (if aborted on deck)

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

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Left: Example of Tyvek tag filled out for marine mammal sample. Front (top) and back (bottom). All samples must be double-tagged and double-bagged.

Bottom: Examples of carcass tags. Be careful to record the tag exactly as it is printed, including the "D0" or "D0A" prefix.



NMFS FISHERIES OBSERVER PROGRAM																					
TripID	A99005C	Land mm/yy	03/20	Gear Code	100																
Species	Harbor Seal		PSID/Seq#	02																	
Haul#	004	Haul Date mm/dd/yy	03/18/20	Stat Area	521																
Tag#	D0A0242	Length	---	Disp	---																
SAMPLE CATEGORY (check all that apply): SPEC. VERIF. PROG. <input type="checkbox"/> AGE STRUCTURE <input type="checkbox"/> TRAINING <input type="checkbox"/> INC. TAKE <input checked="" type="checkbox"/> SPECIAL PROGRAM <input type="checkbox"/> SPECIAL PROGRAM: _____ OTHER: _____																					
SAMPLE TYPE: <table border="0"> <tr> <td>WHOLE <input type="checkbox"/></td> <td>FEATHER <input type="checkbox"/></td> <td>KIDNEY <input type="checkbox"/></td> <td rowspan="5"> DNA: FIN CLIP <input type="checkbox"/> FLIPPER <input checked="" type="checkbox"/> BIOPSY <input type="checkbox"/> SKIN <input type="checkbox"/> </td> </tr> <tr> <td>HEAD <input type="checkbox"/></td> <td>WHISKER <input type="checkbox"/></td> <td>LIVER <input type="checkbox"/></td> </tr> <tr> <td>JAW <input type="checkbox"/></td> <td>BLUBBER <input type="checkbox"/></td> <td>MUSCLE <input type="checkbox"/></td> </tr> <tr> <td>VERTEBRA <input type="checkbox"/></td> <td>STOMACH <input type="checkbox"/></td> <td>REP. ORG. <input type="checkbox"/></td> </tr> <tr> <td>ILLICIUM <input type="checkbox"/></td> <td>HEART <input type="checkbox"/></td> <td>FETUS <input type="checkbox"/></td> </tr> </table>						WHOLE <input type="checkbox"/>	FEATHER <input type="checkbox"/>	KIDNEY <input type="checkbox"/>	DNA: FIN CLIP <input type="checkbox"/> FLIPPER <input checked="" type="checkbox"/> BIOPSY <input type="checkbox"/> SKIN <input type="checkbox"/>	HEAD <input type="checkbox"/>	WHISKER <input type="checkbox"/>	LIVER <input type="checkbox"/>	JAW <input type="checkbox"/>	BLUBBER <input type="checkbox"/>	MUSCLE <input type="checkbox"/>	VERTEBRA <input type="checkbox"/>	STOMACH <input type="checkbox"/>	REP. ORG. <input type="checkbox"/>	ILLICIUM <input type="checkbox"/>	HEART <input type="checkbox"/>	FETUS <input type="checkbox"/>
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OTHER: _____																					

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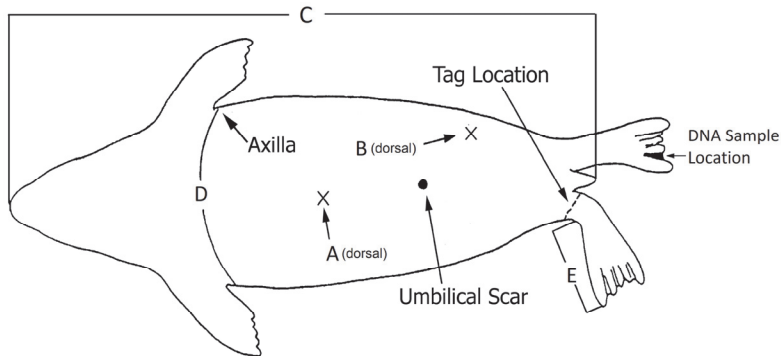
All measurements must be taken in a **straight line** (i.e., not curved with the body) except girth, recorded in cm

Blubber thickness: include skin layer

Body temperature: insert probe about 1" deep

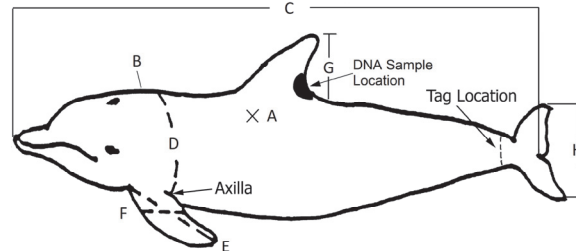
DNA sample: should measure approximately 2" x 2".

Pinnipeds



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

Cetaceans

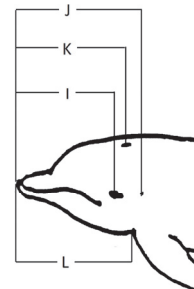


- A. Body Temperature (mid-body)
- B. Blubber Thickness (~2 in. behind blowhole)
- C. Total Length - snout tip to fluke notch
- D. Girth at Axilla (circumference)
- E. Pectoral Flipper Length
- F. Pectoral Flipper Width, maximum
- G. Height of Dorsal Fin
- H. Fluke Width, from tips of flukes

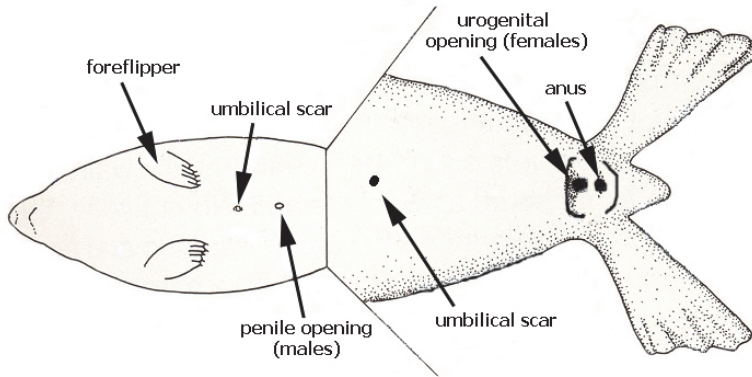
Bottlenose Dolphins

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

- I. Snout to Center of Eye
- J. Snout to Ear
- K. Snout to Center of Blowhole
- L. Snout to Flipper Anterior Insertion



Pinnipeds



Stretch the rear flippers very wide apart at base of tail

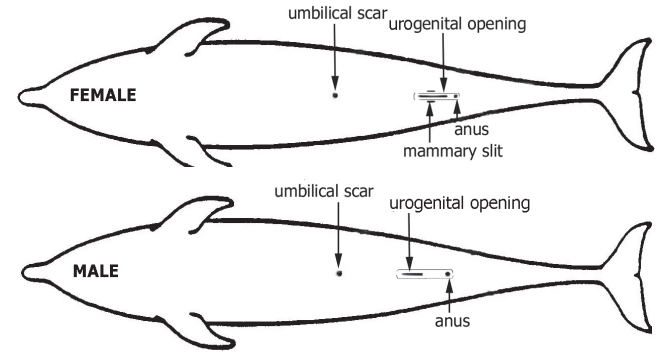
Look inside the outer (urogenital) opening

Female: 2 distinct inner openings (anal and vaginal)

Male: 1 inner opening (anal)

****Tip:** Use 1 foot to hold flipper while using hand to spread other flipper, use remaining hand to take photograph

Cetaceans



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Probe the urogenital opening

Female: forward, towards the head

Male: backward, towards the fluke

IFS

IDENTIFICATION KEY FOR COMMON SEALS

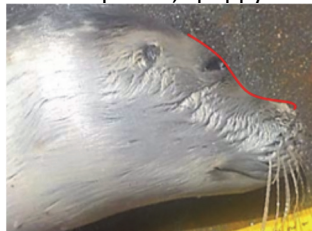
51

Always use teeth as definitive characteristic whenever possible for all seals

Coat has mottled spotting



Concave profile, "puppy-like"

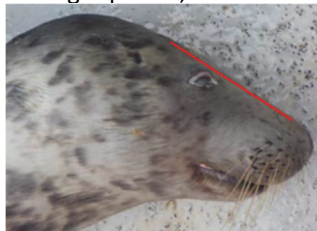


Post-canine teeth angled, close together, multi-cusped



Harbor Seal

Straight profile, "horse-like"



Post-canine teeth cone-like with very small cusps



Gray Seal

Coat is blueish gray dorsally and silver ventrally

Juvenile



Post-canine teeth flattened, mushroom-shaped



Hooded Seal

Distinct "ink splotch" spots or "harp" pattern

Juvenile



Adult



Post-canine teeth multi-cusped, spaced



Harp Seal

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Pilot Whale, NK



Adults up to 25ft in length

- Black/dark gray coloration, white 'anchor' patch on chest
- Bulbous head with prominent melon
- Dorsal fin: broad base, low profile, rounded
- Robust, muscular body, thick tail stock
- Sickle-shaped, long, tapered pectoral flippers
- Little to no beak, peg-like teeth in upper + lower Jaw

Risso's Dolphin



Adults up to 13ft in length

- Black/dark gray base with possible extensive white scarring all over body, head may be lightest in color
- Squared off bulbous melon with vertical forehead crease
- Robust body with tapered tail stock
- Dorsal fin: tall, curved, vertically prominent
- No beak, peg-like teeth only in lower jaw

Bottlenose Dolphin



Adults up to 13ft in length

- Countershaded – dark gray/blue/black dorsally and lighter ventral
- Dorsal fin: falcate, curved
- Short, thick, well defined beak
- Robust muscular body with tapered tail stock
- Coastal and offshore populations

Harbor Porpoise



Adults up to 5ft in length



- Dark gray/black dorsal with lighter sides and white belly, described as 'patchy fade' laterally
- Dorsal fin: triangular, relatively small located slightly after mid-body
- Stocky body shape with small pointed pectoral flippers
- NO BEAK, Small spade like teeth

Atlantic White Sided



Adults up to 9ft in length

- Black on back, top of beak, flippers, and fluke
- Yellow/tan band on upper tail stock with white patch mid body and ventral
- Short, stubby beak
- Dorsal fin: falcate, hooked, tall
- Thick caudal peduncle
- Small, sharp, conical teeth in upper and lower jaw

Common Dolphin



Adults up to 9ft in length

- Distinctive hourglass pattern with tan patch forward and gray towards tail
- V-shaped 'saddle' below dorsal fin
- Long black beak, eye ring, and line from jaw to pectoral flipper
- Dorsal fin: falcate, hooked, tall
- Small, sharp, conical teeth in upper and lower jaw

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IDENTIFICATION FOR COMMON LARGE WHALES

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North Atlantic Right Whale



Adults up to 52ft in length

- No dorsal fin or throat grooves
- Arched jaw; callosities on rostrums, lips, jaw, chin
- Paddle like pectoral flippers
- Fluke smooth with concave margins
- Stocky body shape

Humpback Whale



Adults up to 60ft in length

- Fleshy knobs on rostrum
- Ventral throat grooves
- Long pectoral flippers (1/3) of body
- Hump in front of dorsal fin
- Fluke edges ragged with identifiable white pattern on ventral side

Sperm Whale



Adult females up to 40ft (females) or 52ft (males) in length

- Huge square head, body may appear wrinkled
- Large triangular fluke with irregular smooth edges + deep notch
- Single smooth dorsal hump followed by 'knuckles'
- Toothed whale, small mouth

Minke Whale



Adults up to 25ft in length

- Head short, sharply pointed with pronounced rostral ridge
- Chevron pattern dorsally (behind head)
- White band on both pectoral flippers
 - "Minkes wear mittens"
- Tend to not show fluke

Fin Whale



Adults up to 85ft in length

- Dorsal fin tall, falcate, blunt tip; short gradual slope
- Pale chevron pattern dorsally (behind head)
- Lower jaw on RIGHT IS WHITE
- Rolls (like a cartwheel) when diving, tend to not show fluke

Sei Whale



Adults up to 60ft in length

- Dorsal fin tall, erect – leading edge meets back at steep angle 2/3rds back on body
- Both sides of jaw gray
- Short ventral throat grooves
- Sinks (like submarine) when diving, tend to not show fluke

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Reporting Right Whales and Dead Whales

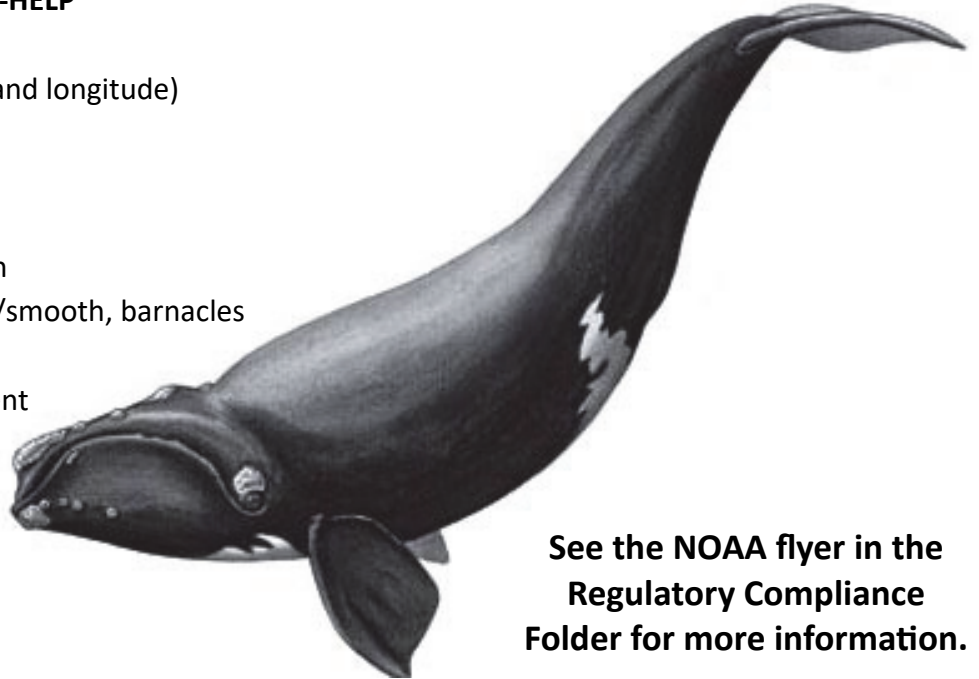
Coast Guard (channel 16)

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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Alcids

Plumage: black dorsally, white ventrally

Bill: can vary, **no** tubenose

Body Shape: football-shaped, can be held in 1 hand, stubby wings

Feet: 3 webbed toes with no 4th

Thin-Billed Murre

Plumage

Breeding: dark face/throat, possible white eye ring

Non-Breeding: whitish face with dark eye streak from eye to nape

Bill Shape: long, pointed, black



Dovekie*



Razorbill*



Puffin



*can have similar breeding vs. non-breeding plumage changes as Thin-Billed Murre

Gulls

Plumage: black/gray dorsally, white ventrally

Bill: medium in size, slightly hooked, **no** tubenose, yellow with possible red spot

Body Shape: long wings

Feet: 3 webbed toes with 4th minute, "swollen" heel



Great Black-Backed Gull

- Largest gull in world
- All black mantle
- Pink legs/feet
- Juvenile: mottled gray/brown with dark colored beak



Herring Gull

- Gray mantle with black wing tips
- Pink legs/feet
- Juvenile: mottled gray/brown with dark tipped beak



Black-Legged Kittiwake

- Small bodied
- No spot on beak
- Narrow wings
- Legs all black

Loons

Plumage: typically seen at sea in non-breeding plumage, similar between both species making ID challenging; white spots on black back, white belly + under wings (see guide for breeding plumage)

Bill: long, pointed, **no** tubenose

Body Shape: heavy bodied, "linebacker"

Feet: 3 webbed toes with 4th minute, flat tarsus (leg bone), legs set far back on body

Common Loon

- Bill thick, approx. two finger width
- "Larger" body



Red-Throated Loon

- Bill slightly upturned, needle like
- "Smaller" body



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Pouch Bill

Plumage: varies by species

Bill: can vary, **no** tubenose, gular pouch

Body Shape: larger bodied

Feet: 4 webbed toes

Double Crested Cormorant



- Beak and gular pouch orange in color, long
- Feet/legs all black
- All black plumage

Northern Gannet



- Beak heavily plated, gray/blue
- Plumage white body with black wing tips, yellow "crown"
- Feet black with blue/green stripes

Brown Pelican



- Prominent throat pouch on large bill
- Very large bird
- Possible to see white pelican

Tubenose

Plumage: varies by species

Bill: prominent nasal tubes, hooked

Body Shape: small bodied

Feet: 3 webbed toes with 4th minute, pink with black edging

Greater Shearwater



- Plumage white ventrally with brown belly smudge, dark dorsally



Sooty Shearwater



- Plumage all dark with white under wings



Northern Fulmar



- "Gull like" appearance
- Bill has thick large knob on end, "stout"
- Light AND dark color morphs

Waterfowl

Plumage: varies by species, males tend to have vibrant coloration and females will be brown

Bill: "duck like" in shape, colors can vary

Body Shape: larger bodied, appear like duck

Feet: 3 webbed toes with 4th lobed to tip of toenail

Common Eider



- Feathers go down sides of bill
- Males have green bill, females have dark brown/black bill
- Non-breeding males dark breast and head, immature similar but white breast

Surf Scoter



White-Winged Scoter



Black Scoter



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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.

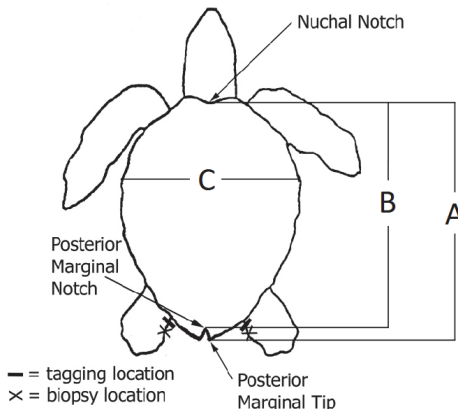
Tag number and information must be recorded for all tags.

Biopsy Location

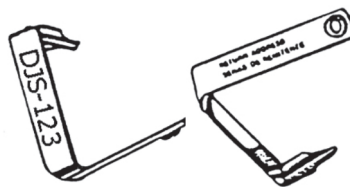
Just outside (away from the body) of the tag location

One crescent shape biopsy per rear flipper (2 total)

****Make sure to follow all requirements, such as using alcohol/betadine appropriately**

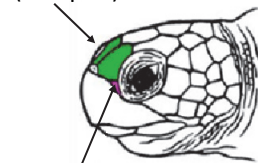


Measurements, curvilinear, in cm
A. Notch-to-Tip Length
B. Notch-to-Notch Length
C. Carapace Width



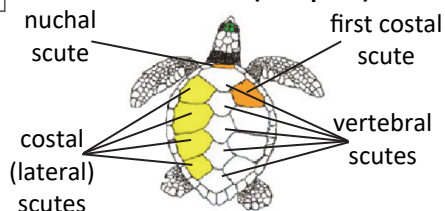
Examples of an Inconel tag.

Pre-frontal scales
(one pair)

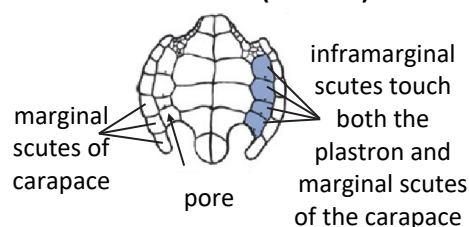


pre-ocular scale

Dorsal View (Carapace)



Ventral View (Plastron)



HVF

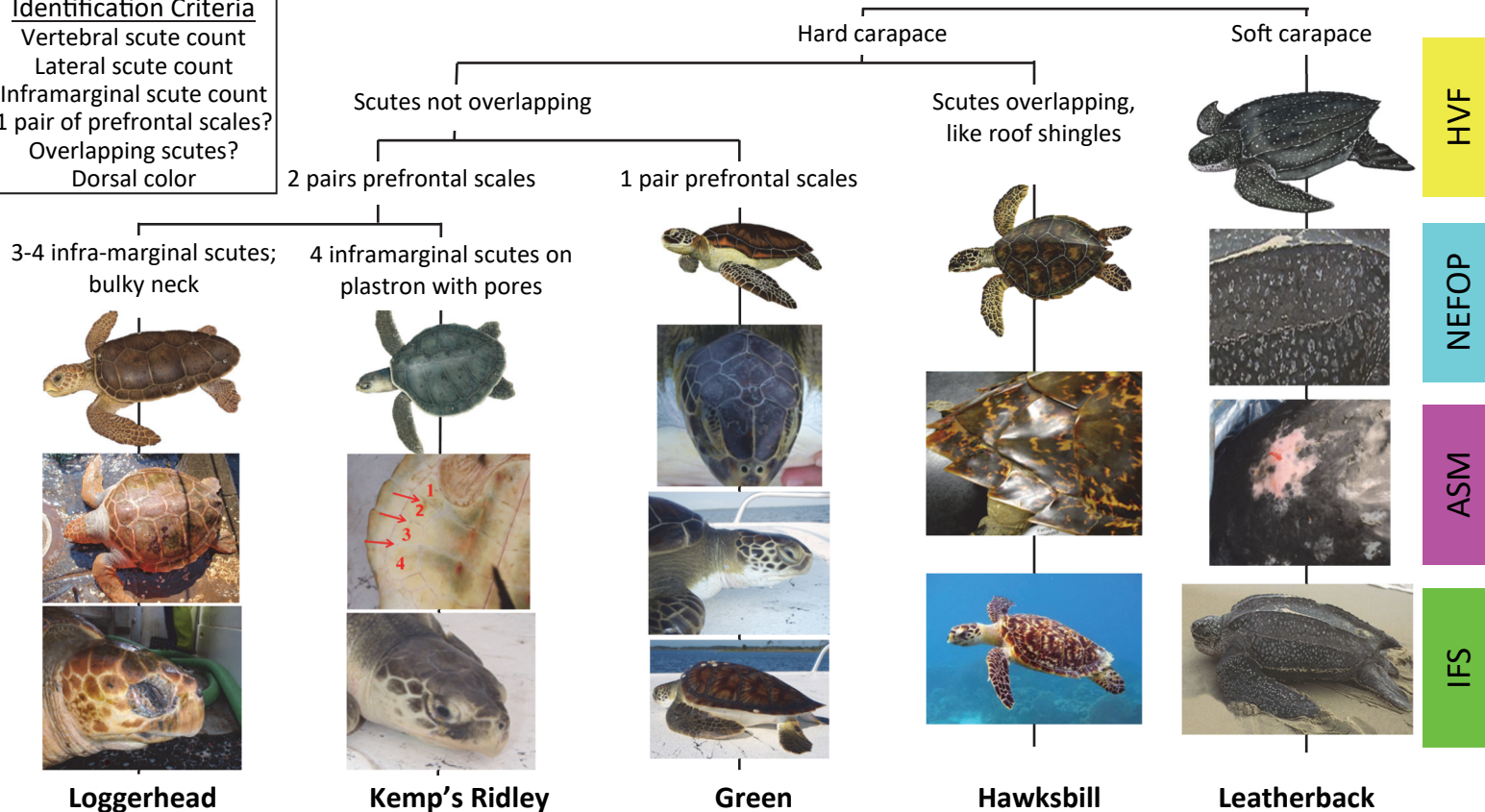
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Identification Criteria

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

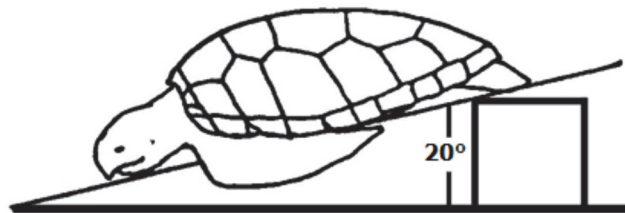


Resuscitation must be attempted on sea turtles that are comatose or inactive, but not dead.

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 (laying on its 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 **released 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.



Condition

- Odor (strength)
 - Left and right eye (if intact, color, cloudy/clear, true to life, bloodshot)
 - Feathers/fur/skin sloughing off easily or hold tight to body
 - Bloating, or lack off
 - Body texture
 - Blood color or other bodily fluids, estimate amount
 - Any other details that help determine condition, see Operations Manual
- * **Wounds/damage: include size estimates, locations, depth, color, texture —> include as much detail as possible to the point that it could be recreated based on comments alone***

Characteristics

- Coloration of overall body (plumage for birds)
- Mammals: teeth, head/body shape (rostrum length for cetaceans)
- Birds: Beak shape (tubenose or lack of) and feet description
- Turtles: Number of Scutes + Prefrontal Scales (confirmation of pores if applicable)

Story

- Entanglement
 - How was the animal first seen?
 - Describe gear interaction/orientation in gear
 - How was it removed from gear? Cutting?
- How was animal moved around on board?
- If alive:
 - What happened while animal was on deck
 - Any interaction with crew?
 - Behavior
- Sampling details:
 - What was done?
 - Reason why any required sampling not done
- How long was animal on deck?
- Release:
 - Did it sink or float?
 - How long did you watch?
 - Status of boat at release (neutral or steaming)
 - Any gear remaining on animal (how much and where on body)

HVF

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INCIDENTAL TAKE DUTIES OVERVIEW

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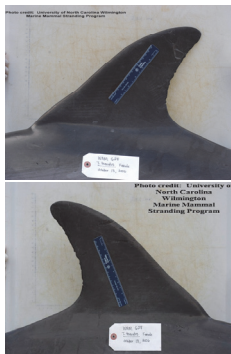
	Marine Mammals (pages 47-54)	Sea Birds (pages 55-56)	Sea Turtles (pages 57-59)	
Live Animals	<ul style="list-style-type: none"> *1. Photograph and video. *2. Describe ID, condition, story. *3. Release, comment on behavior and any gear remaining on animal. <p>DO NOT tag live marine mammals</p>	<ul style="list-style-type: none"> *1. Photograph and video. *2. Describe ID, condition, story. *3. Check for the presence of bands. *4. Release, comment on behavior and any gear remaining on animal. Release away from gear, vessel slowed. Lower by hand as close to water as possible, releasing hold of head last. 	<ul style="list-style-type: none"> *1. Photograph and video. *2. Describe ID, condition, story. *3. Check for the presence of tags. Record tag number and photograph. 4. Collect body measurements. 5. Collect biopsy/tissue (genetic) sample. Live: Biopsy if >25cm notch-to-tip Dead: Retain whole, if possible; otherwise biopsy 6. Tag, using Inconel tag(s) on rear flipper(s). Live: 2 tags if >30cm notch-to-tip Dead: 1 tag 7. Scan for PIT tags on flippers and all soft tissues *8. Live or comatose: attempt resuscitation Obviously Dead: (e.g., damaged shell, severely wounded) release. 	HVF
Dead Animals	<ul style="list-style-type: none"> 1. Collect DNA sample. *2. Tag using yellow marine mammal tag. Record and photograph any existing tags. *3. Photograph. *4. Describe ID, condition, story. 5. Collect body measurements. 6. Collect body temperature. 7. Determine sex. *8. Release, comment on behavior and any gear remaining on animal. 	<ul style="list-style-type: none"> *1. Photograph. *2. Describe ID, condition, story. *3. Check for presence of bands. Record band number/color and retain band, if possible. 4. Retain whole seabird, if possible. Only retain "dead fresh" animals; otherwise release 		NEFOP
				ASM
				IFS

***ASM trips** (groundfish and HVF): follow only starred steps.

ALL ANIMALS

Always include something for scale!

- Entire animal on **all** sides seen
 - Mammals: left/right
 - Birds/Turtles: dorsal/ventral
 - *Reminder: never flip a leatherback*
- Close-ups of head:
 - Each side (left/right with each eye visible)
- Close-up of gear entanglement
- Any wounds, marks, scars, or damages
- Any tags/bands, new or existing



Marine Mammals (Takes)

- Teeth
- Genital area
- Close-up of dorsal fin on both sides (cetaceans)
 - *REQUIRED for all bottlenose dolphins*

Marine Mammals (Sightings)

- Flukes, dorsal and ventral
- Dorsal fin
- Pectoral fins
- Callosities (right whales)
- Any trailing gear

Sea Turtles (Photos)

- Pre-frontal scute pattern
- Top of head

Sea Turtles (Videos)

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

VIDEO IS MANDATORY



Sea Birds

- Close-up of feet



HVF

NEFOP

ASM

IFS



revised 05/01/2020