

Biological Data – Specimen Collection, Tags, Identification

Objectives

- ▶ List 3 types of age structures
- ▶ Explain how to select a random otolith sample
- ▶ Describe 5 components of the species ID form for Scorpaenidae
- ▶ Demonstrate your ability to complete the Specimen Collection, Tag Encounter/Recovery and Species Identification forms

Whole fish / invertebrates

- ▶ Reference collection / Unidentifiable / rare species
 - ▶ Take photo if can't collect whole specimen
- ▶ Document on Specimen Collection form
- ▶ Preservation
 - ▶ Salt
 - ▶ Ice
 - ▶ Freezing *
 - ▶ Chemicals
- ▶ Label

Age structures

- ▶ **Scales**



<http://en.wikipedia.org>

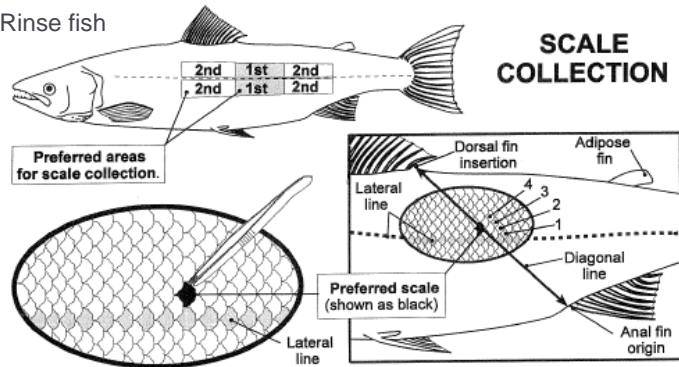


Bob Magnien www.eralabs.com

Age structures

▶ Scales

- ▶ Rinse fish



- ▶ Place in envelope

Image from Hanrahan et al.(1997)

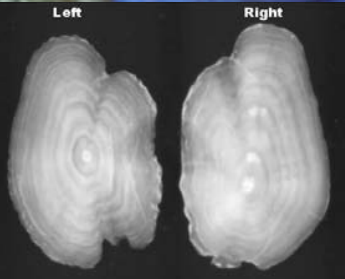
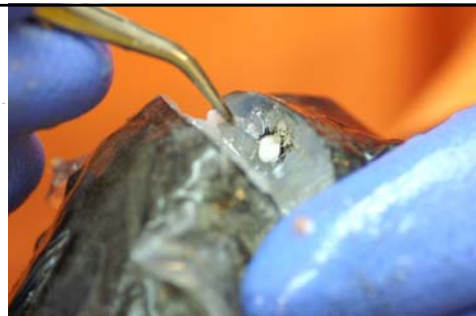
Age structures

- ▶ Scales
- ▶ Spines / rays



Age structures

- ▶ Scales
- ▶ Spines / rays
- ▶ Otoliths (inner ear bones)



Age structures

- ▶ Scales
- ▶ Spines / rays
- ▶ Otoliths

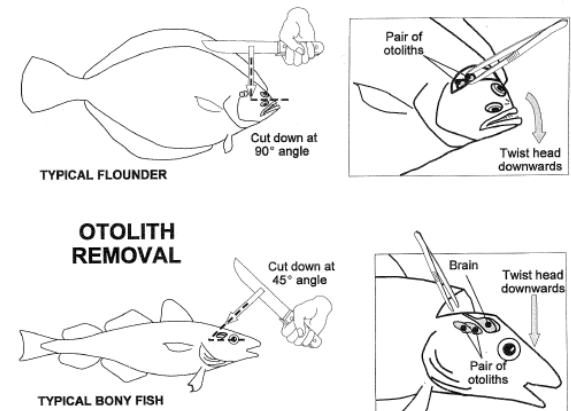


Image from Hanrahan et al.(1997)

Age structures

- ▶ Scales
- ▶ Spines / rays
- ▶ **Otoliths** – remove membrane & dry before storing

Scale Sample No. _____
 Species _____
 Length _____
 Sex _____ Weight _____
 Location _____ State of Organs _____
 Gear _____
 Collector _____ Date _____
 Wildlife Supply Co. • 800-799-8301 • www.wildco.com



Age structures

- ▶ Scales
- ▶ Spines / rays
- ▶ Otoliths
- ▶ **Thorns / vertebrae**

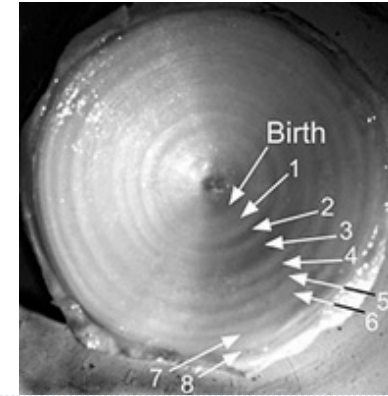
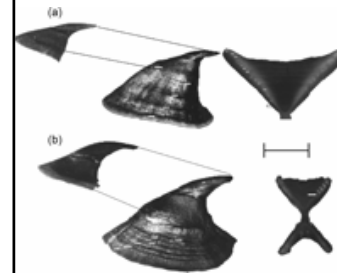


Image from Arkhipkin et al. 2008

Image :S. Campana, Bedford Institute of Oceanography, Canada, http://earthguide.ucsd.edu/fishes/kinds/kinds_lifestyle.html

Selecting individuals

- ▶ Species – depends on assignment
- ▶ Individuals
 - ▶ Whole fish / inverts – haphazard
 - ▶ Age structures – random selection from length sample

Specimen Collection

Page ____ of ____

Observer code _____ Vessel code _____ Trip ID _____
 Date (dd/mm/yy) _____ Haul _____

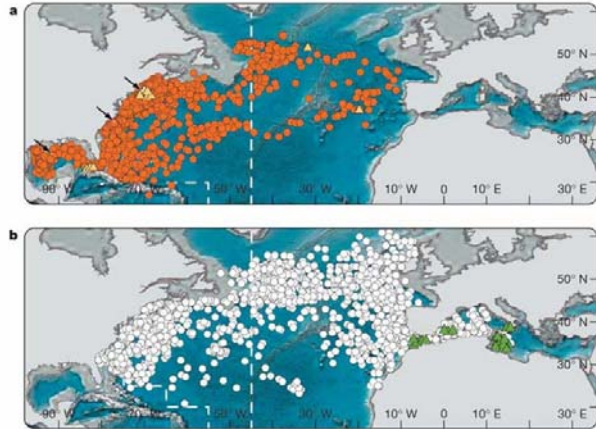
Species Name	Species Code	Spec. Type	Specimen #	Sex	Mat.	Length (cm)	Weight (kg)	Comment
		↑	↑				↑	

Specimen Type

1 - whole animal	2d - thorn	Sex:
2a - scales	2e - vertebrae	M - Male
2b - spine/ray	3 - stomachs	F - Female
2c - otoliths		- Indeterminate
		J - Unknown

Tags

▶ Atlantic bluefin tuna – tagging data



Tags

▶ Conventional

- ▶ Spaghetti
- ▶ Streamer
- ▶ Disc

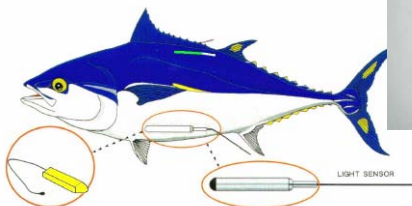


Tags

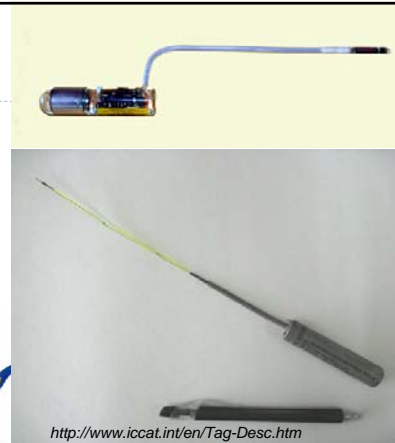
▶ Conventional

▶ Electronic

- ▶ Archival (implanted)



Drawing from Anon. (2008)



<http://www.iccat.int/en/Tag-Desc.htm>

Tags

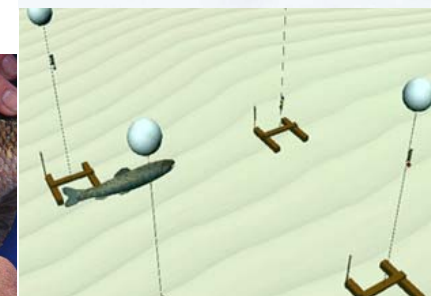
▶ Conventional

▶ Electronic

- ▶ Archival
- ▶ Acoustic (implanted)



http://www.pier.org/CA_coastal_tagging.shtml



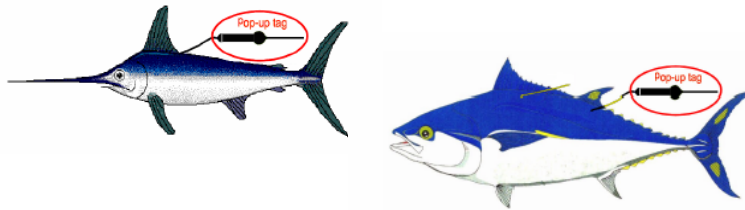
<http://www.htisonar.com/>

Tags

- ▶ Conventional
- ▶ **Electronic**
 - ▶ Archival
 - ▶ Acoustic
 - ▶ Pop-up (satellite; external)

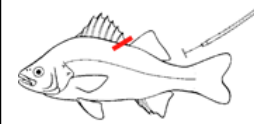


<http://www.tunalab.unh.edu/PSATresearch.htm>



▶ Drawings from Anon. (2008)

Tags



Tag Encounter and Recovery			
Observer code	Vessel code	Trip ID	Haul / Set
Tag Information			
Tag Number		Check one: <input type="checkbox"/> Applied <input type="checkbox"/> Recaptured & released alive <input type="checkbox"/> Removed	
Tag type	Tag location	Tag color	
<input type="checkbox"/> Conventional <input type="checkbox"/> Archival (implanted) <input type="checkbox"/> Electronic (other) <input type="checkbox"/> Other	<input type="checkbox"/> Below 1st dorsal fin <input type="checkbox"/> Behind pectoral <input type="checkbox"/> Opercle <input type="checkbox"/> Belly	<input type="checkbox"/> Blue <input type="checkbox"/> Green <input type="checkbox"/> Pink <input type="checkbox"/> White <input type="checkbox"/> Other	
Who found tag?		When was tag found?	
Name:		<input type="checkbox"/> While fishing	
Address:		<input type="checkbox"/> During offload	
Phone/email:		Date:	
Location:			
Fish Information			
Species name	Species code	Length (cm)	Weight (kg)
Sex (M,F,I,U)			
Structures collected?	Length types (Circle # and letter)	Weight types (Circle # and letter)	
<input type="checkbox"/> Otoliths <input type="checkbox"/> Scales <input type="checkbox"/> Other: _____ <input type="checkbox"/> None	01 Fork C Curved 02 Total S Straight 03 Standard E Estimated 04 Eye to fork 05 Lower jaw to fork 11 Disc width	Blank - no weight A Actual 01 Whole E Estimated 02 Gilled & gutted 03 Gilled & headed 04 Headed & gutted 99 Other, describe in comment	
Invertebrate Information			
Species name	Species code	Length (cm)	Weight (kg)
Sex (M,F,I,U)			
Structures collected?	Length types (Circle one)	Weight types (Circle # and letter)	
<input type="checkbox"/> Carapace <input type="checkbox"/> Eggs <input type="checkbox"/> Other: _____ <input type="checkbox"/> None	02 Total 32 Body 34 Carapace length (lobster) 37 Carapace length (crab) 38 Carapace width (crab)	Blank - no weight A Actual 01 Whole E Estimated 99 Other, describe in comment	
Comments			
Invertebrate Information			

Phone/email:		Date:	
Location:			
Fish Information			
Species name	Species code	Length (cm)	Weight (kg)
Sex (M,F,I,U)			
Structures collected?	Length types (Circle # and letter)	Weight types (Circle # and letter)	
<input type="checkbox"/> Otoliths <input type="checkbox"/> Scales <input type="checkbox"/> Other: _____ <input type="checkbox"/> None	01 Fork C Curved 02 Total S Straight 03 Standard E Estimated 04 Eye to fork 05 Lower jaw to fork 11 Disc width	Blank - no weight A Actual 01 Whole E Estimated 02 Gilled & gutted 03 Gilled & headed 04 Headed & gutted 99 Other, describe in comment	
Invertebrate Information			
Species name	Species code	Length (cm)	Weight (kg)
Sex (M,F,I,U)			
Structures collected?	Length types (Circle one)	Weight types (Circle # and letter)	
<input type="checkbox"/> Carapace <input type="checkbox"/> Eggs <input type="checkbox"/> Other: _____ <input type="checkbox"/> None	02 Total 32 Body 34 Carapace length (lobster) 37 Carapace length (crab) 38 Carapace width (crab)	Blank - no weight A Actual 01 Whole E Estimated 99 Other, describe in comment	
Comments			
Version 1.2 6/2011			

Tag rewards

REWARD
for the recapture of a tagged fish



If you find a tagged fish don't pull out the tag until the specimen is measured or weighed. If you can save the fish for examination, do so.

The following information needs to be reported (as detailed as possible):
Tag code (letters and numbers), colour and address printed in the tag
Species, size (if possible) and length or weight (specify type & units of measurements)
Date and place where the fish was caught and the fishing gear used

Please provide any additional information, such as water temperature, fish condition, wounds, etc.



> Tags implanted on fish are used to learn about fish behaviour and migrations and to estimate important population parameters, such as abundance, mortality and growth. There are three main types of tags: (1) Conventional, (2) Pop-up Satellite Archival, and (3) Internal Archival.

> Pop-up Satellite Archival tags are electronic data logging devices that provide location estimates, swimming depth and water temperature. This information is collected and stored in the tag's memory. A summary of these data is then transmitted to the tag's satellite system after the tag pops off at a predetermined time. Pop-up tags are valuable even when found on a beach years later because their memory still maintains the data accurately.

> Internal Archival Tags are implanted in the abdomen of the fish and only the sensor can be seen protruding from the body. These are electronic data-logging devices that provide the same information as pop-up tags, as well as the fish body temperature. This information is stored in the tag until the fish is recaptured. **Please avoid pulling the sensor when removing the tag from the fish.** To remove the tag make an incision on the fish's body.

Acoustic tags are also electronic tags placed inside the body cavity and are not visible from the outside.



To claim your reward please contact or send information together with the tag and your address to:
ICCAT, E-mail: info@iccat.int, Address: C.P. 542, Madrid, Spain
ICCAT
Closest Local Fishing Agency Recovery form available in www.iccat.int

INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNA

Species Identification

Genus / Species

- Marine mammals
- Sea turtles
- Sharks & rays
- Bony fish: Tunas & tuna-like fishes, see also country specific list in Appendix 1
- Shrimp: *Penaeus notialis*, *Penaeus kerathurus*, *Parapenaeopsis atlantica*, *Parapenaeus longirostris*
- Crab: *Callinectes amnicola*, *C. pallidus*, *Portunus validus*, *Callapa roboarguttata*
- Lobsters: *Panulirus regius*, *P. argus*
- Cuttlefish, octopus and squids: *Sepia officinalis hieredda*, *Sepia bertheloti*, *Octopus vulgaris*, *Illex coindetii*, *Alloteutis africana*, *Loligo vulgaris*

Family

- Seabirds
- Fish: all except those listed in Species column and country specific list

Phylum / Class / Order

- Phyla**
- Porifera – sponges;
- Classes**
- Scyphozoa – jellyfish
 - Polycheta
 - Gastropoda – snails, limpets, nudibranchs
 - Pycnogonida – sea spiders
 - Crinoidea – feather stars
 - Stellerioidea – starfishes
 - Echinoidea – sea urchins, sand dollars
- Order**
- Holothuroidea – sea cucumbers
 - Actinaria – sea anemones
 - Scleractinia – corals
 - Pennatulata & Gorgonacea – sea pens, sea whips, sea fans

Species Identification Forms

- ▶ Verification of ID
- ▶ Different forms for different groups
 - ▶ Sharks
 - ▶ Rays, skates } Elasmobranch ID
 - ▶ Scorpaenidae
 - ▶ Flatfish
 - ▶ Misc. Fish
 - ▶ Crustacean
 - ▶ Invert
 - ▶ Seabirds
- ▶ Check boxes for presence/absence & counts of various features

Species ID – Scorpaenidae

- ▶ *Scorpaena angolensis*



Scorpaenidae Species Description

Observer code: _____ Vessel Code: _____ Trip ID: _____

Common name / code: _____


Month: _____ Specimen collected? Y / N Total length (cm): _____ Fork length (cm): _____

Date: _____ Photos? Y / N Sex: M / F / U Weight (kg): _____

Check box for presence/absence Present Absent Head spine strength (circle one) WEAK STRONG

Occipital pit	
Posterior teeth	

Circle the numbers of all head spines present



Describe color: _____

Fin spine & ray counts: Spines Rays Pencil fin ray (circle one) BRANCHED UNBRANCHED

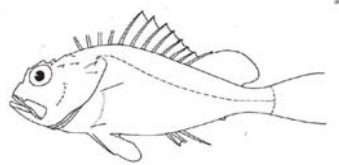
Dorsal	
Anal	

Total count: _____ # Free of melanophores: _____

Suborbital spine – count: _____

Draw the animal and include the following

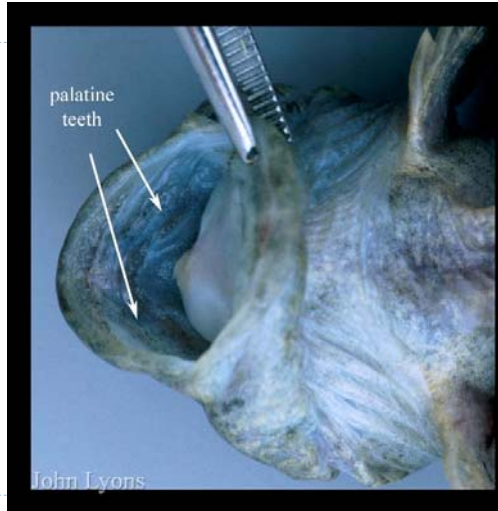
1. Shape of dorsal fin – fill in gaps (range)
2. Dorsal fin shape
3. Shape of eye
4. Anal fin
5. Suborbital spines (on chart)
6. Preopercular spine
7. One plus fin on head
8. Head profile in 3/4 view



Additional field characteristics used to identify the species

(V.L. 2005)

- ▶ Palatine teeth - patches of small teeth on the palatine bones that are found on each side of the roof of the mouth
- ▶ Occipital pit - a cavity in the hind portion of the upper surface of the skull.



<http://www.wiscfish.org/fishid/wFrmGlossary.aspx>

Crustacean Species Description

Observer code: _____ Vessel Code: _____ Trip ID: _____

Common name / code: _____

Haul: _____ Specimen collected? Y / N Total length (mm): _____ Length type: _____

Date: _____ Photos? Y / N Carapace length (mm): _____ Length type: _____

Sex: M / F / I / U Carapace width (mm): _____ Weight (g): _____

Describe color: _____

How many?	
Pairs of walking/swimming legs	<input type="text"/>
Pairs of legs with pincers	<input type="text"/>

Draw the animal and include the following:

1. Shape of carapace
2. Spines, bumps, hairs, etc.
3. Detail of rostrum

Activity

- ▶ Use information on handout to complete a Specimen collection, Tag and Species ID form
- ▶ 15 minutes



Photo by: Pedro Niny Duarte; www.fishbase.org

Summary

- ▶ Which age structures can be collected from fish?
- ▶ How will you select fish for an otolith collection?
- ▶ What do you do if you encounter a tag?
- ▶ List a few components on the Scorpaenidae species ID form

References

- ▶ AFSC. 2009. North Pacific Groundfish Observer Program, 2010 Observer Sampling Manual. North Pacific Groundfish Observer Program. Fisheries Monitoring and Assessment Division, Alaska Fisheries Science Center, 7600 Sand Point Way, NE, Seattle, WA 98115. Access at: <http://www.afsc.noaa.gov/FMA/document.htm>.
- ▶ Anon. 2008. Report of the 2007 Meeting of the Ad Hoc Working Group on Tagging Coordination, Madrid, Spain, March 15-16, 2007 (SCRS/2007/018). ICCAT Coll. Vol. Sci. Pap. **62:1973-2028**.
- ▶ Arkhipkin, A. I., Baumgartner, N., Brickle, P., Laptikhovsky, V. V., Pompert, J. H. W., and Shcherbich, Z. N. 2008. Biology of the skates *Bathyraja brachyurops* and *B. griseocauda* in waters around the Falkland Islands, Southwest Atlantic. – ICES Journal of Marine Science, 65: 560–570.
- ▶ Barbara A. Block, Steven L. H. Teo, Andreas Walli, Andre Boustany, Michael J. W. Stokesbury, Charles J. Farwell, Kevin C. Weng, Heidi Dewar & Thomas D. Williams. 2005. Electronic tagging and population structure of Atlantic bluefin tuna . Nature 434: 1121-1127
- ▶ Hanrahan, J., D. J. Melindy, and J. V. Pelrine. 1997. At-sea Observer Program Operations Manual: A Training Aid and Field Reference. National At-sea Fisheries Observer Program, Department of Fisheries and Oceans, Ottawa, Canada.
- ▶ Van Helvoort, G. 1986. Observer program operations manual. FAO Fisheries Technical Paper 275, FAO, Rome.

Activity – Biological Sampling (Part 2)

Name:

On this haul you collected 1) a fish that you encountered for the first time, 2) otoliths from one of the discard species and 3) found a tagged shark. Complete a Specimen Collection, Tag Encounter/Recovery and Species Identification form using the following information.

Observer code: A732; Vessel code: LIB732; Trip 91; Date: May 1, 2011; haul 3

The otoliths are from three African red snapper (*Lutjanus agennes*).

Specimen#	Sex	Length (fork)	weight
75	M	45	3.2
76	F	24	0.8
77	F	34	1.15

A tag was found on a milk shark (*Rhizoprionodon acutus*). Total length 85 cm; weight 3.75 kg. The tag is a red spaghetti tag (conventional) that was attached at the base of the dorsal fin. You were the first to notice the tag while you were sampling. The fish was retained as part of the catch. Tag info is below:

HCP5499934 Spanish Inst.Ocean. Vigo

You've identified the new fish as a swallowtail seaperch (*Anthias anthias*) which is in the family Serranidae. You did not take any photos but you collected the fish for ID verification. The specimen is 16cm (fork), 19cm (total) and weighs 0.4 kg. The coloration is red/orange and has some yellow blotches/stripes on its back & stripes on opercle. The dorsal fin has 10 spines and 15 rays and the anal fin has 3 spines and 8 rays.

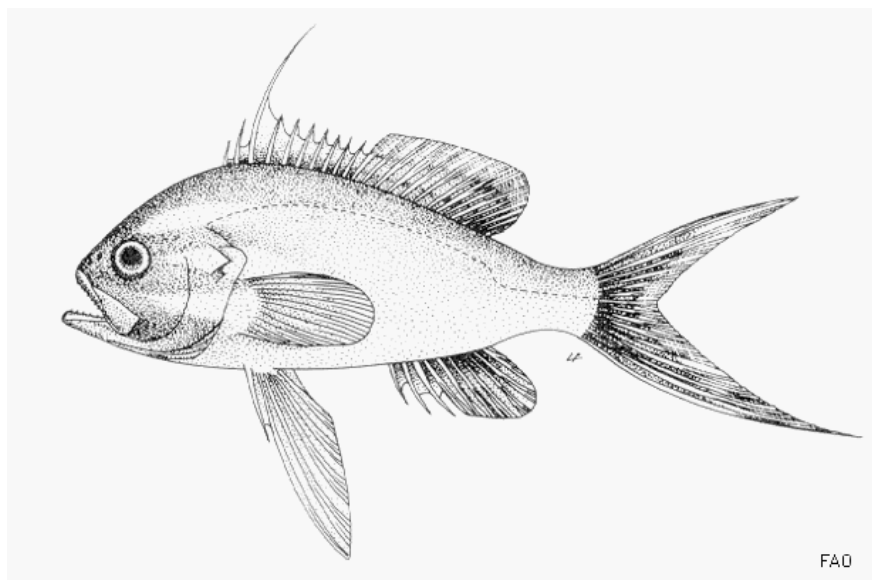


Image: Schneider (1990)

Tag Encounter and Recovery

Observer code	Vessel code	Trip ID	Haul / Set
---------------	-------------	---------	------------

Tag Information

Tag Number Check one: Applied Recaptured & released alive Removed

Tag type

- Conventional
 Archival (implanted)
 Electronic (other)
 Other _____

Tag location

- Below 1st dorsal fin
 Behind pectoral
 Opercle
 Belly
 Carapace
 Other _____

Tag color

- Blue
 Green
 Pink
 White
 Other _____
 Yellow
 Red
 Orange
 Metal

Who found tag?

Name:
Address:
Phone/email:

When was tag found?

- While fishing
 During offload

Date:
Location:

Fish Information

Species name	Species code	Length (cm)	Weight (kg)	Sex (M,F,I,U)
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Structures collected?

- Otoliths
 Scales
 Other: _____
 None

Length types (Circle # and letter)

- 01** Fork **C** Curved
02 Total **S** Straight
03 Standard **E** Estimated
04 Eye to fork
05 Lower jaw to fork
11 Disc width

Weight types (Circle # and letter)

- Blank - no weight **A** Actual
01 Whole **E** Estimated
02 Gilled & gutted
03 Gilled & headed
04 Headed & gutted
99 Other, describe in comment

Invertebrate Information

Species name	Species code	Length (cm)	Weight (kg)	Sex (M,F,I,U)
--------------	--------------	-------------	-------------	---------------

Structures collected?

- Carapace
 Eggs
 Other: _____
 None

Length types (Circle one)

- 02** Total
32 Body
34 Carapace length (lobster)
37 Carapace length (crab)
38 Carapace width (crab)

Weight types (Circle # and letter)

- Blank - no weight **A** Actual
01 Whole **E** Estimated
99 Other, describe in comment

Comments

Misc. Fish Species Description

Observer code: _____ Vessel Code: _____ Trip ID: _____

Common name / code: _____

Haul: _____ Specimen collected? **Y / N** Total length (cm): _____ Fork length (cm): _____

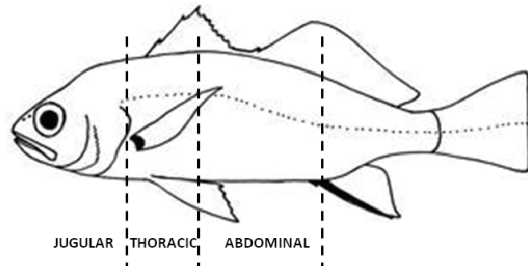
Date: _____ Photos? **Y / N** Weight (kg): _____

Sex: **M / F / I / U**

Check box for presence/absence Present Absent

Adipose fin	Present	Absent
Pelvic fins		
Chin barbel		

Pelvic fin position (circle one)



	How many?	Spines	Rays
Dorsal fins			
Anal			

Describe color : _____

	Upper	Lower
Gill rakers		

Draw the animal and include the following:

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. Shape of dorsal fin –fill in spine heights 2. Caudal fin shape 3. Pectoral fin shape 4. Anal fin shape | <ol style="list-style-type: none"> 5. Pelvic fin position 6. Lateral line(s) 7. Position of any spines, cirri, barbells, etc. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|

Additional field characteristics used to identify this species: