

Live Sessions Week 8:

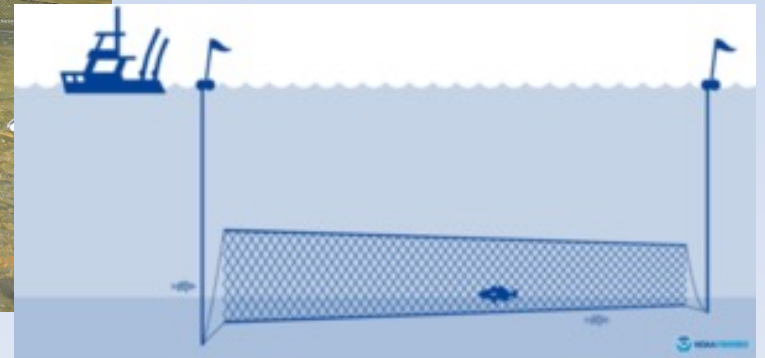
Essential Skills 15 and 16: Fish inventory and fish identification



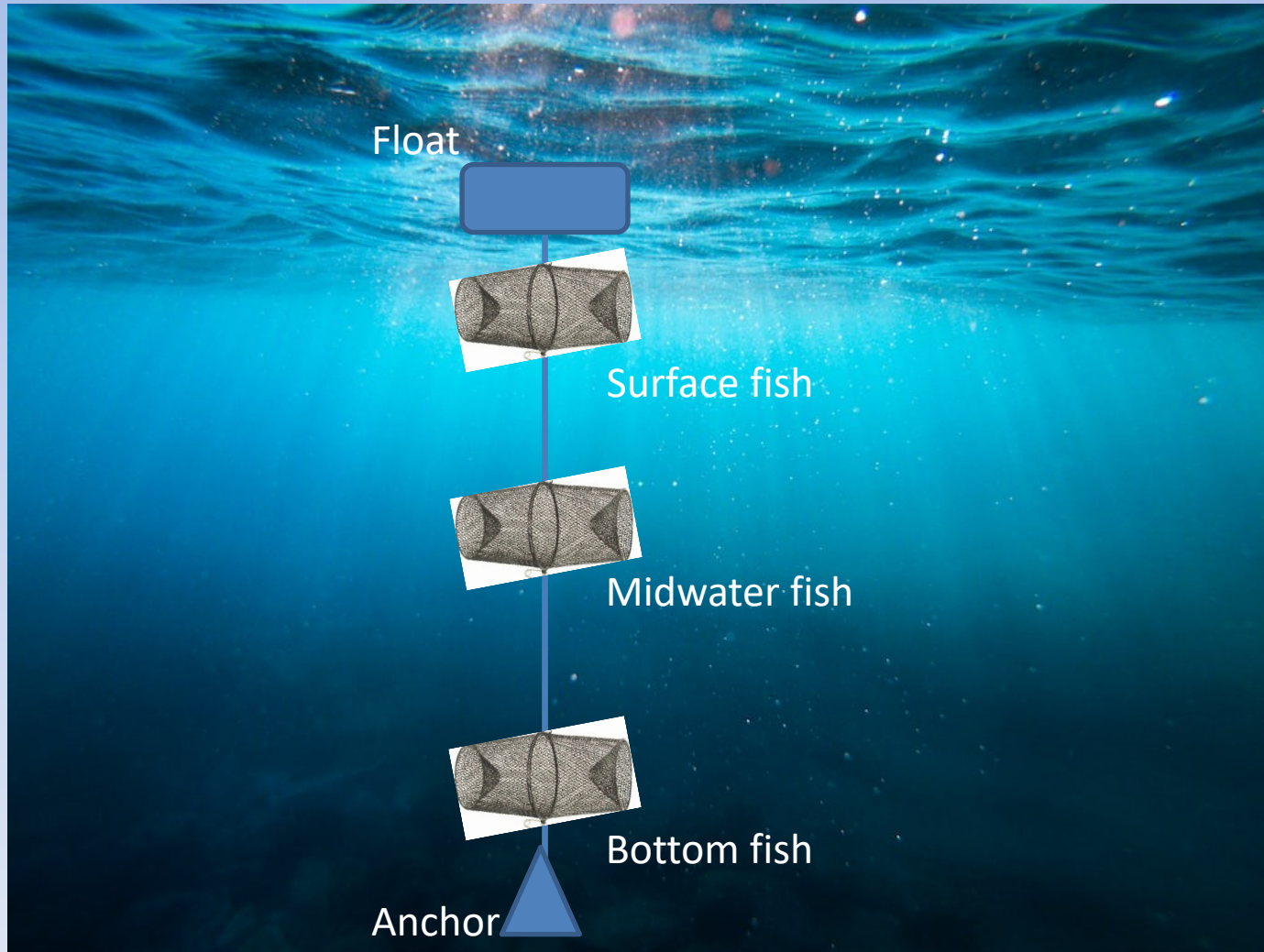
Essential Skill #15: Fish Inventory



Passive methods

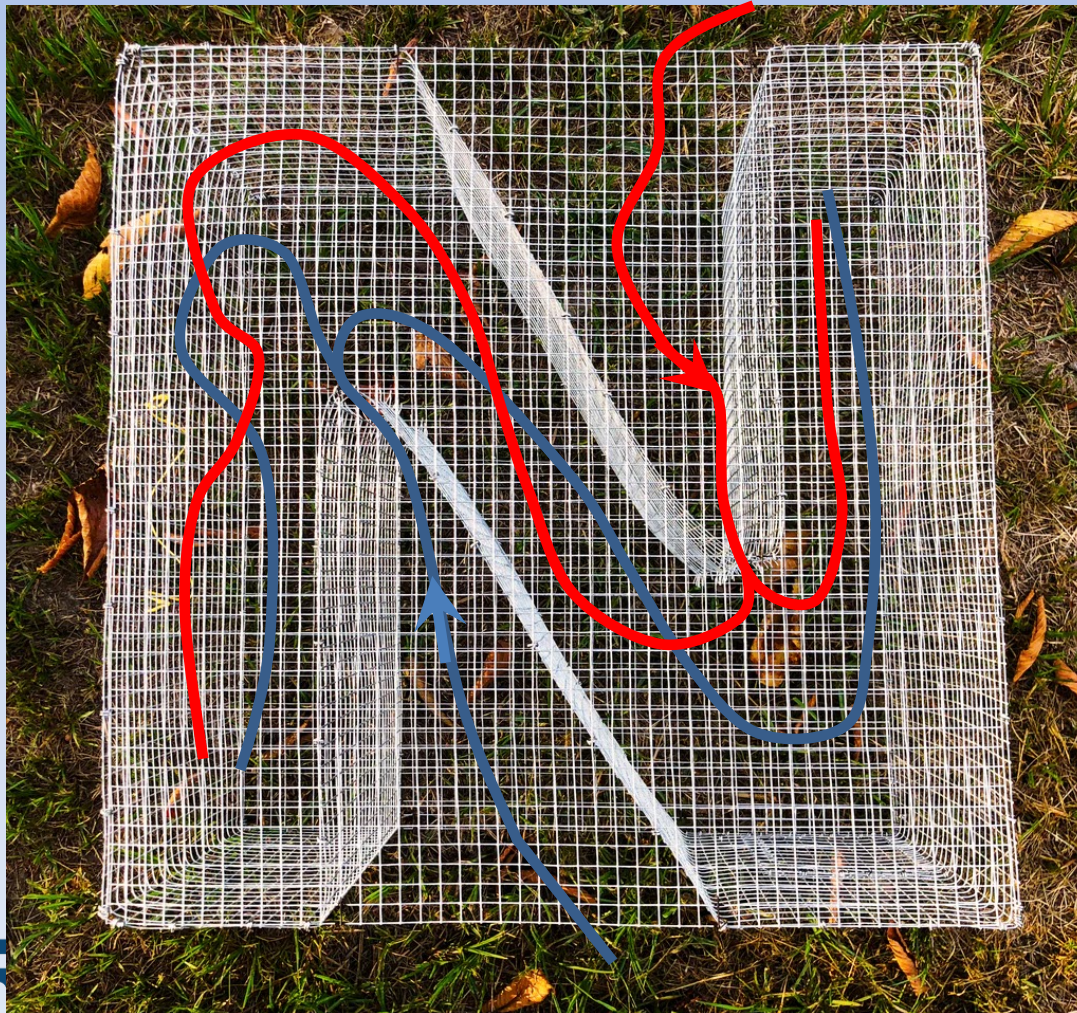
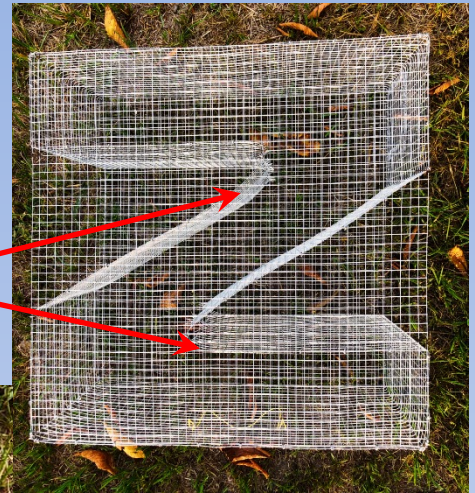


(1) Suspended minnow traps

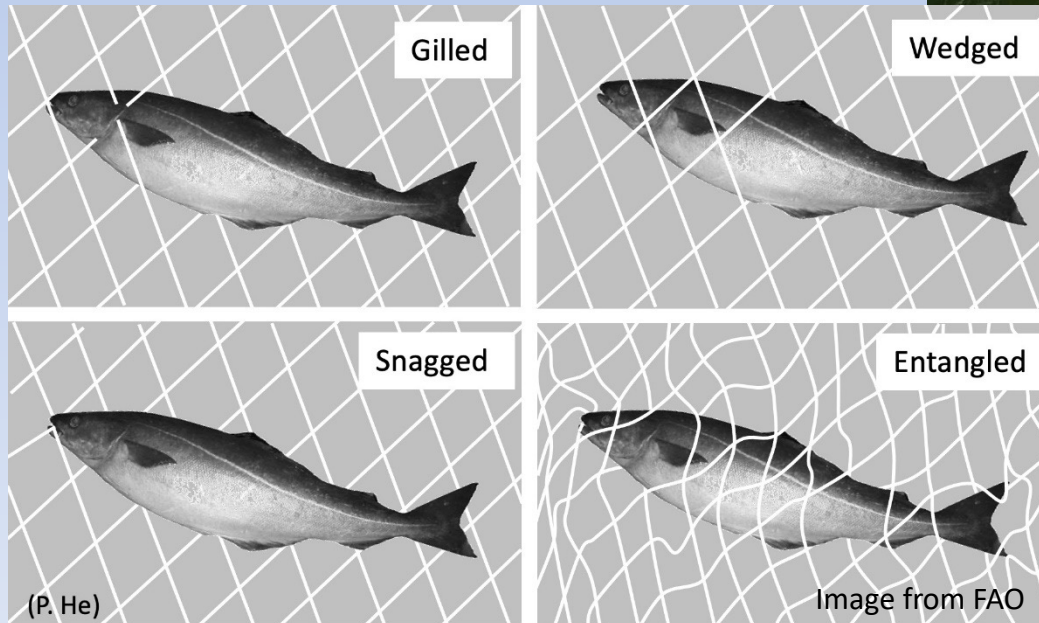


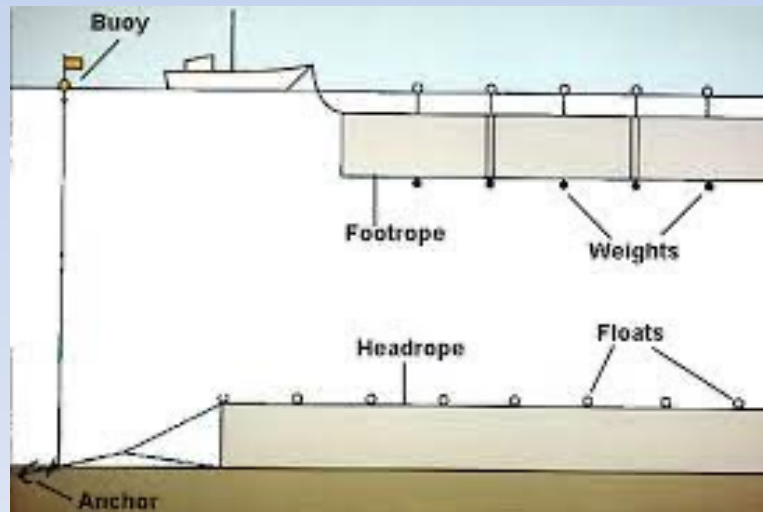
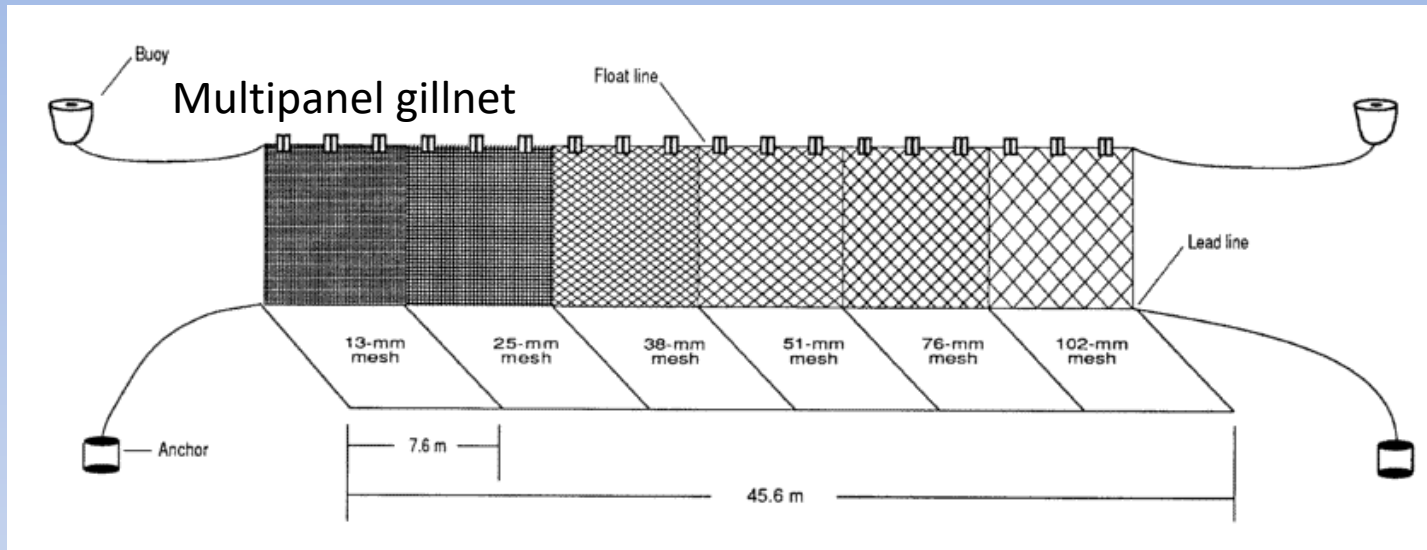
(2) Z trap

Narrow gaps in mesh
allowing fish entry



(3) Gillnet





Surface set

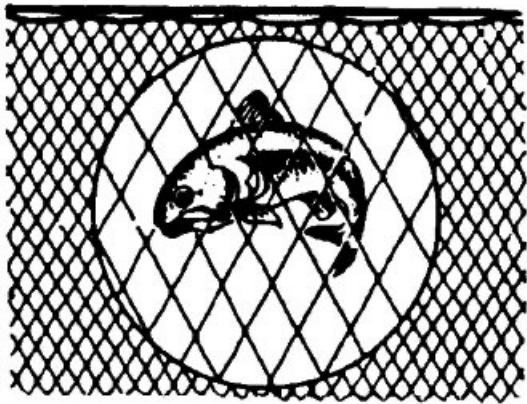
Bottom set

Bycatch and gillnets

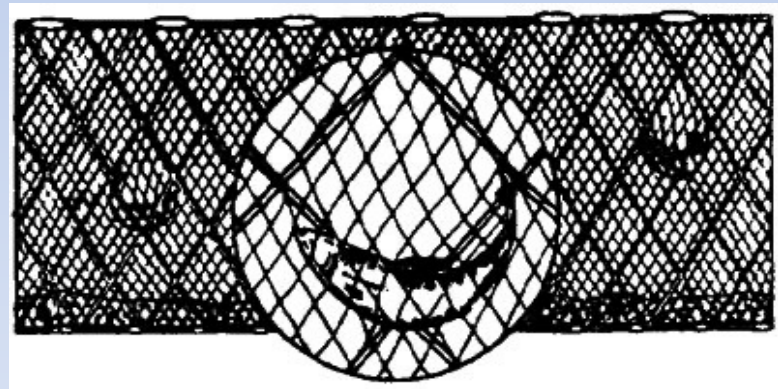
To minimize bycatch:

- Don't set if other sensitive species present
- Use only a single mesh appropriate only to target species
- Set in a way to minimize interaction with other species
- Use a modified gillnet (tangle net)
- Use a different method

Tangle net (modified gillnet)

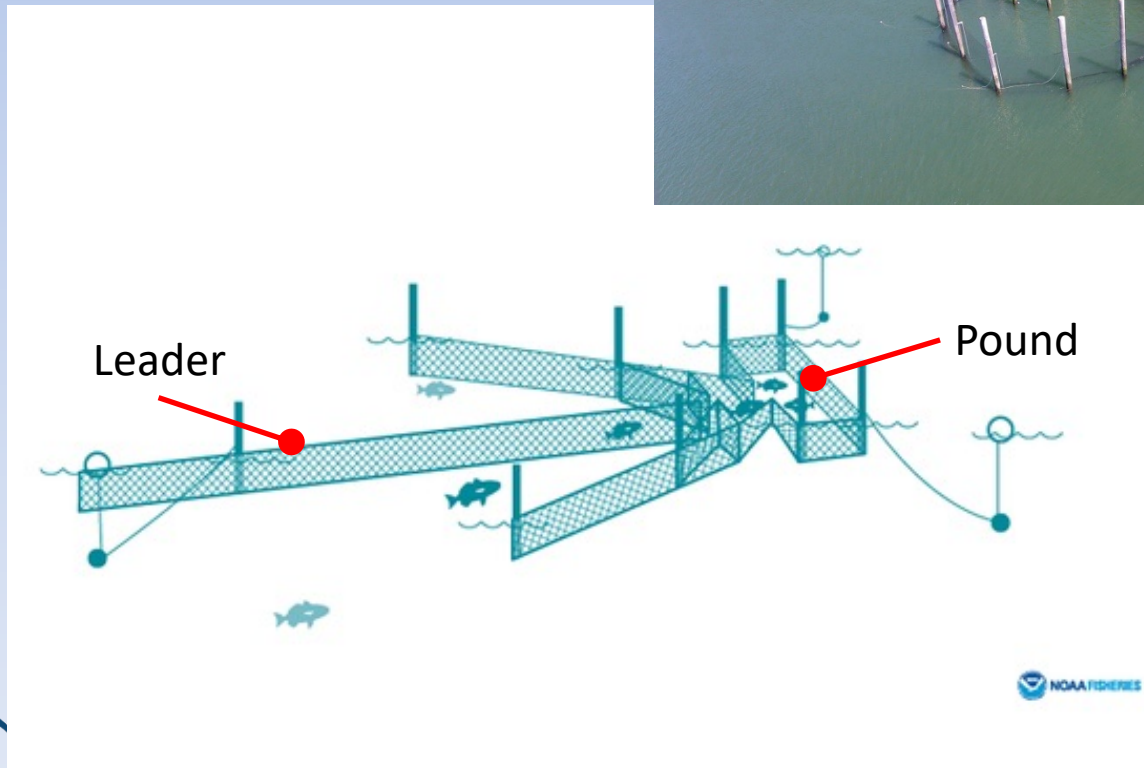


Gillnet

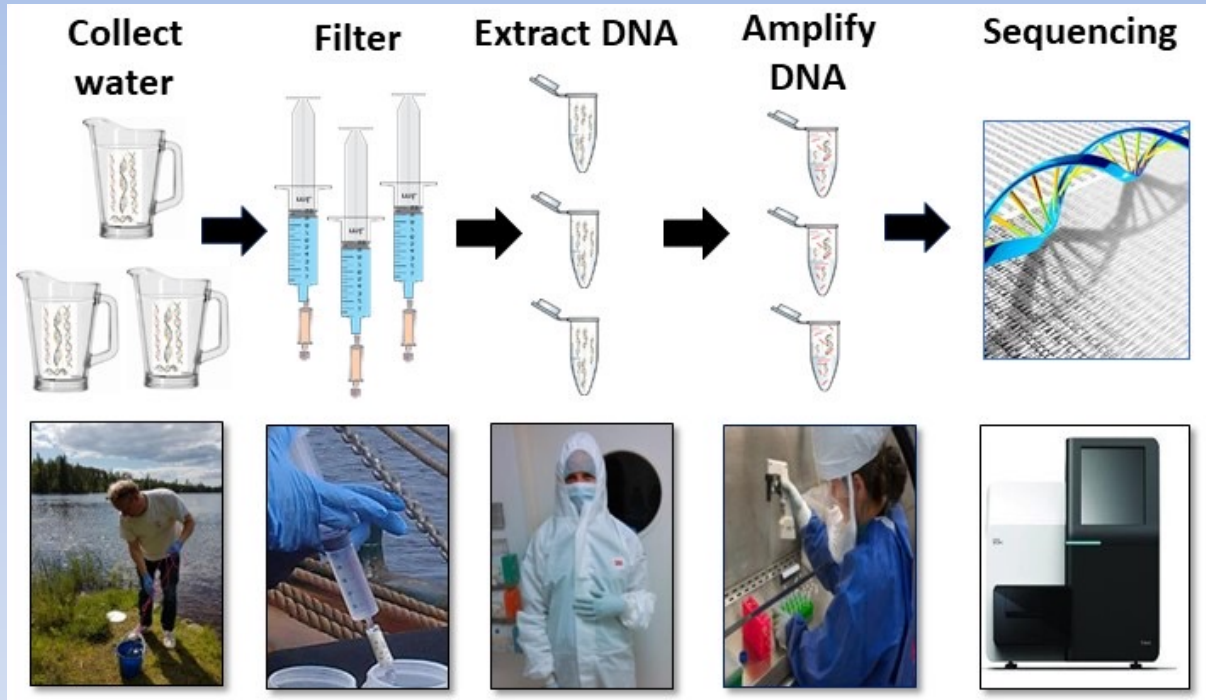


Tangle net

(4) Pound nets



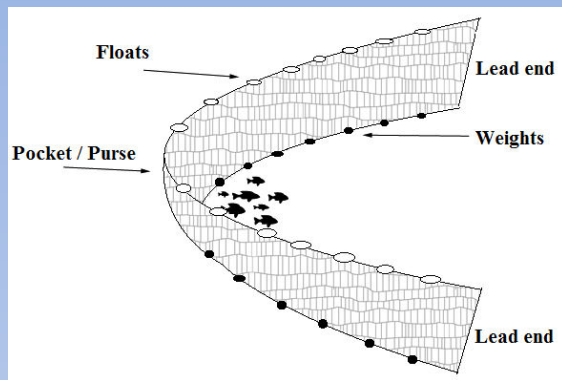
(5) Environmental DNA (eDNA)



Identification
of species



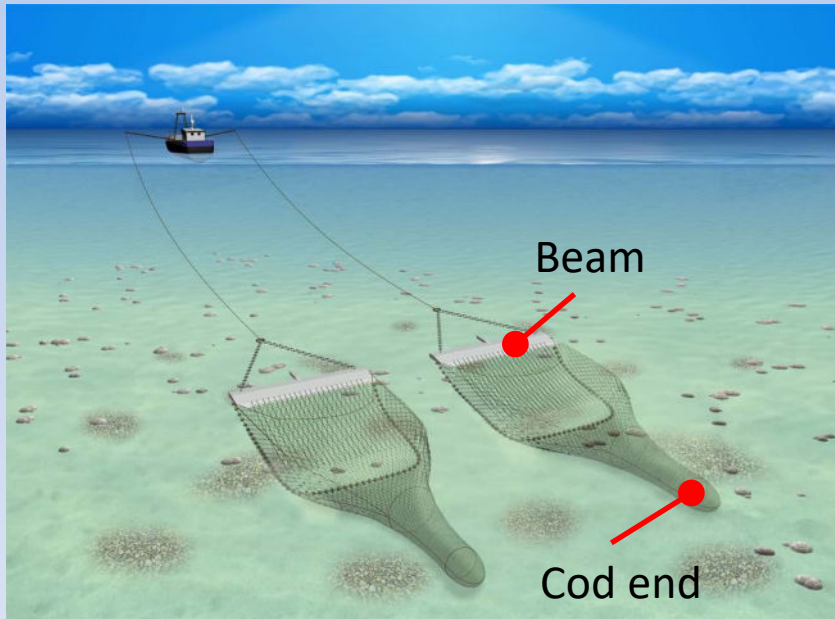
Active Methods



(1) Trawl surveys

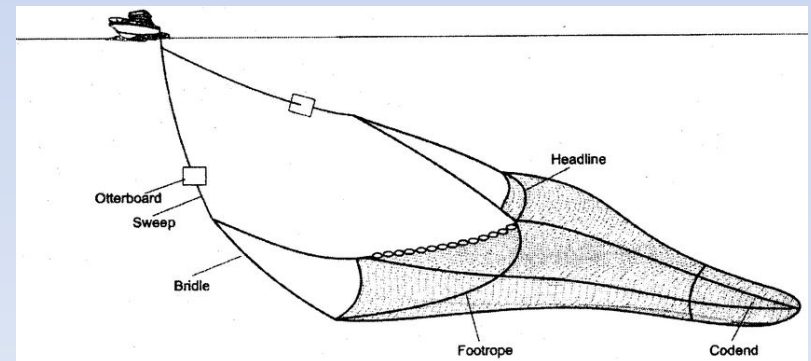
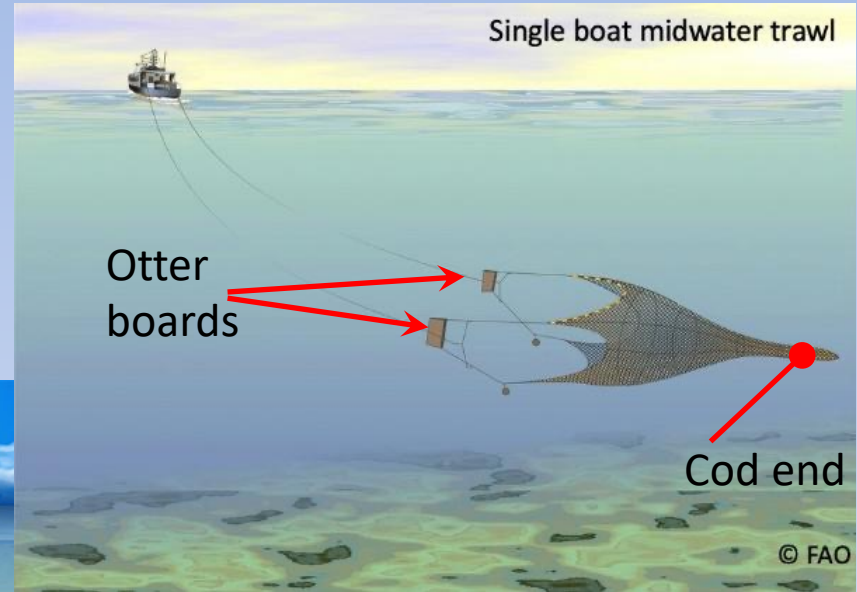
A seine is a curtain

beam trawl



Otter trawl

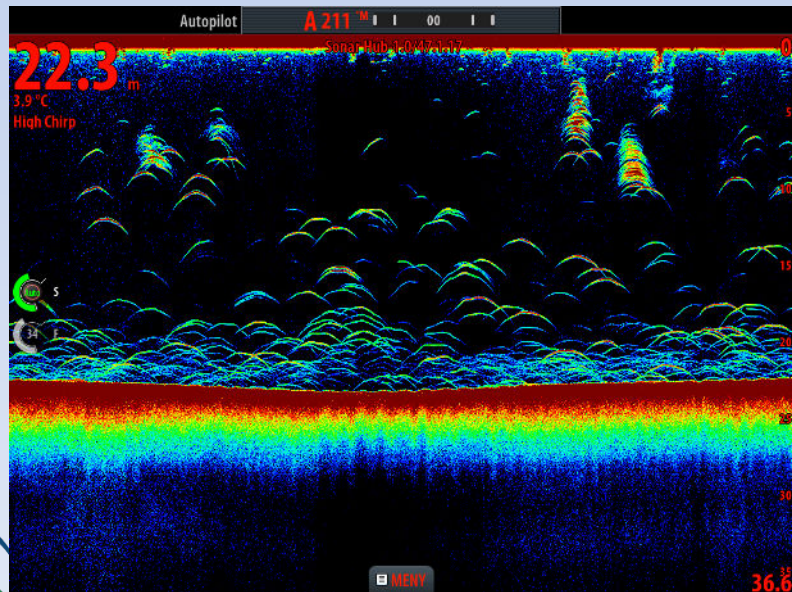
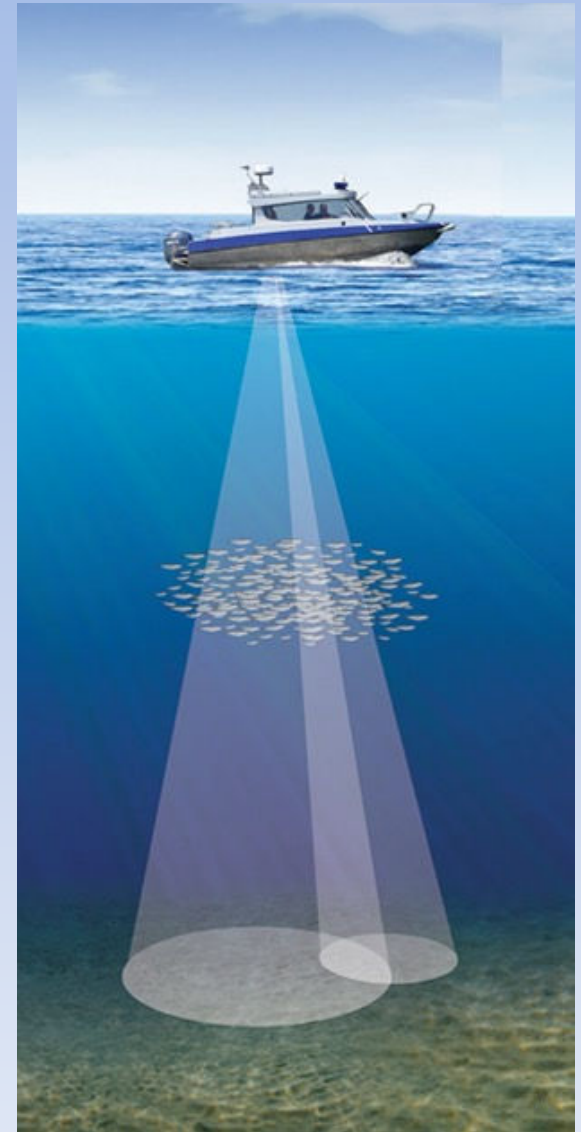
Single boat midwater trawl



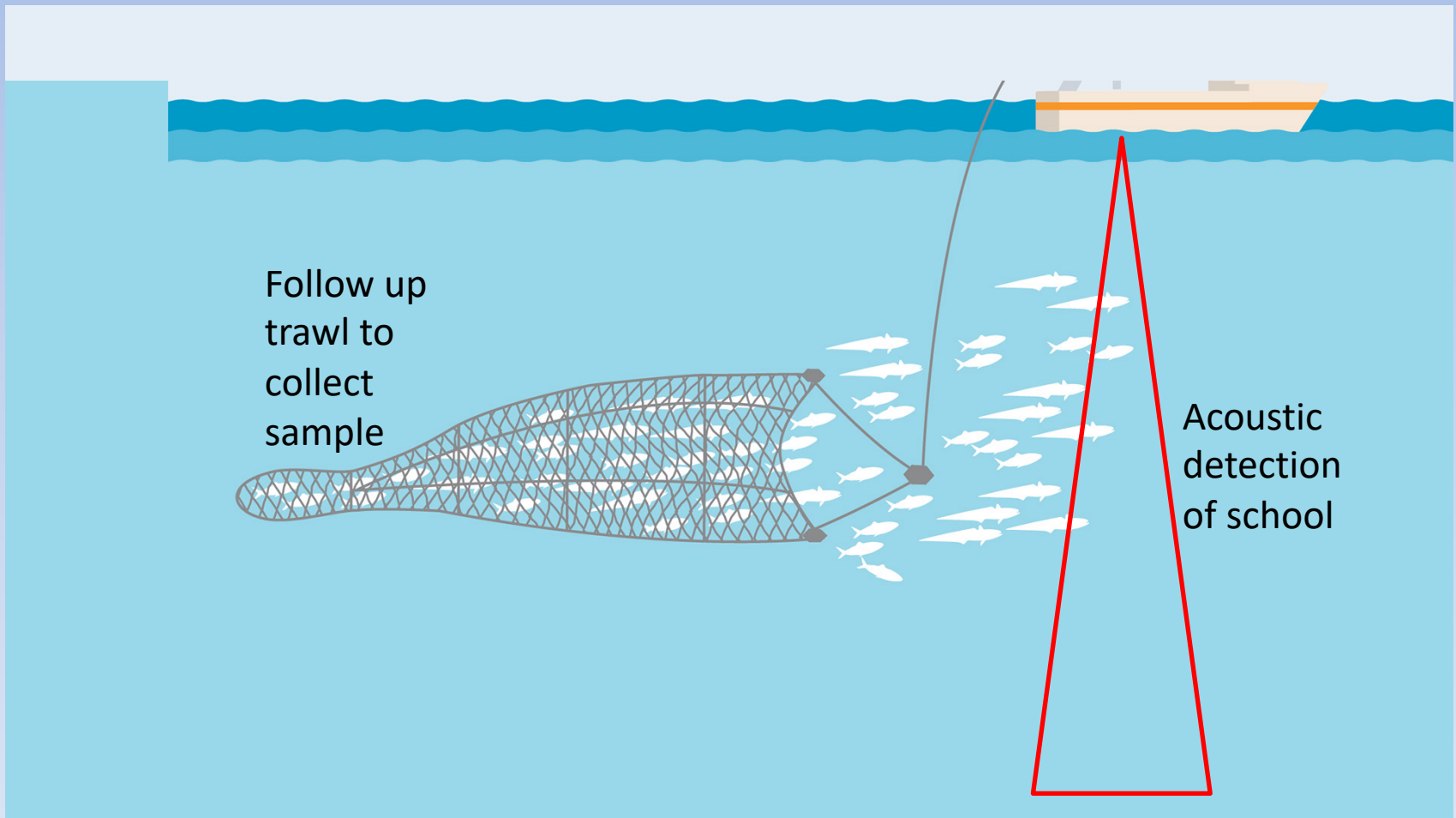
A trawl is a bag



(2) Acoustic surveys



Acoustic trawl surveys



(3) Spearfishing



Passive methods	Active methods
Minnow traps	Angling
Fyke nets	Snorkeling
Fish fences	Beach seining
Rotary screw traps	Electrofishing
Z-trap	Trawl survey
Gillnet (and tangle net)	Acoustic survey
Pound net	Spearfishing
Environmental DNA	

Essential Skill #16: Fish identification



Paddlefish



Lake chub



White perch



Gila trout



American eel



Sturgeon (juvenile)

Feature	Birds	Fish
Body size	X	X
Body shape	X	X
Appendages		Number and placement of fins
Field marks	X	X
Colour	X	

Body size



Small fish (hundreds of species)

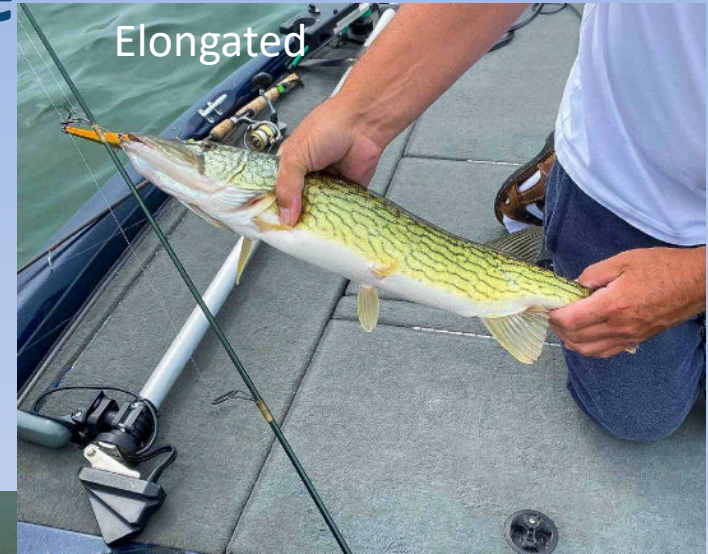


Large bodied fish (tens of species)

Body shape



Eel-like



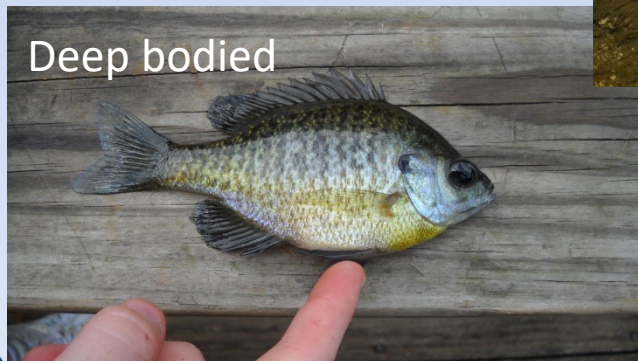
Elongated



Stocky /
flattened



Streamlined



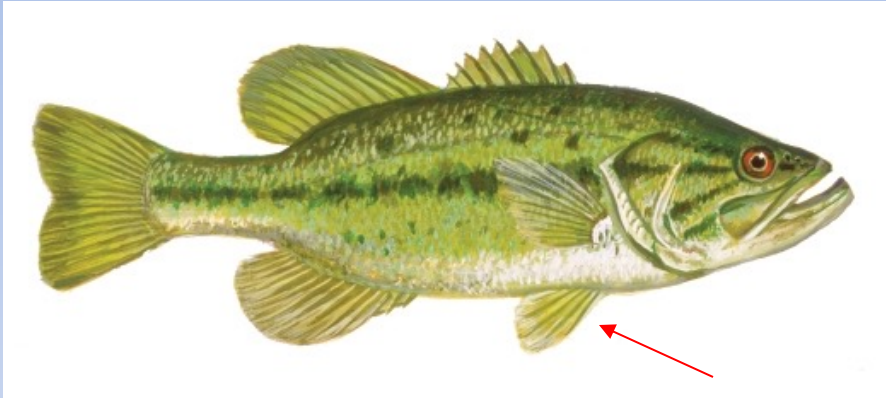
Deep bodied



Elongated snout

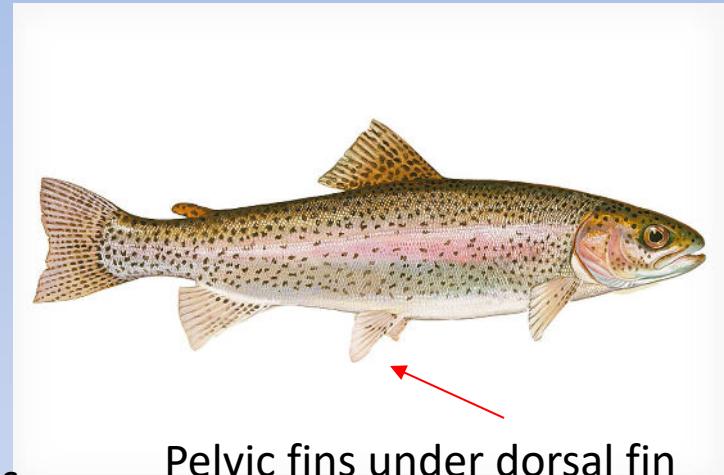
Appendages

Two dorsal fins: front one spiny, rear one rayed



Pelvic fins under pectoral fins

One dorsal fin, one adipose fin



Pelvic fins under dorsal fin

Two dorsal fins: front one small, rear one elongated



Pelvic fins immediately behind gills



Field marks



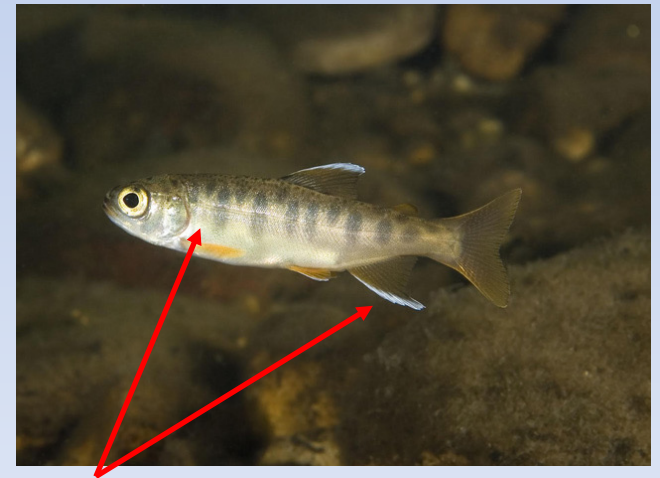
Large scales



Small scales



barbels



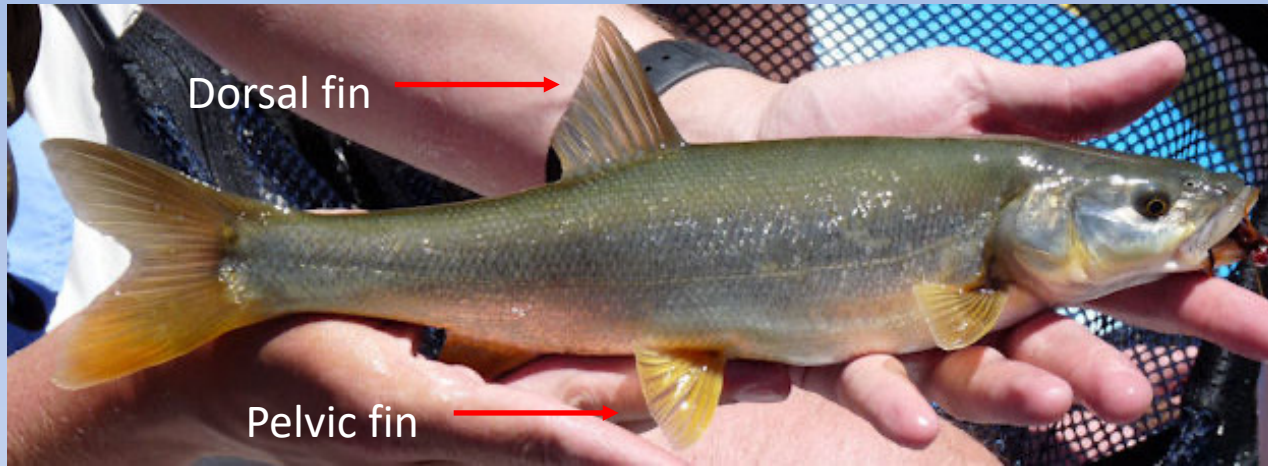
Bands and markings

A note on colour

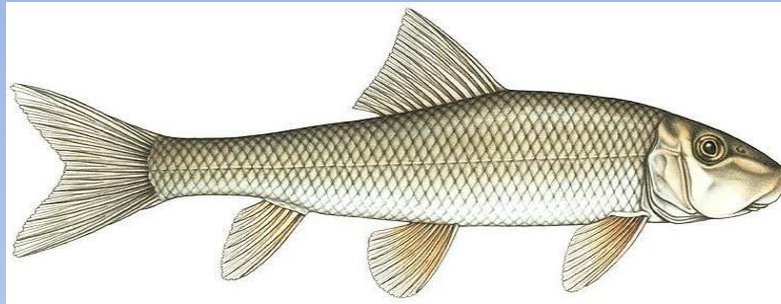


All are golden shiner (of the minnow family)

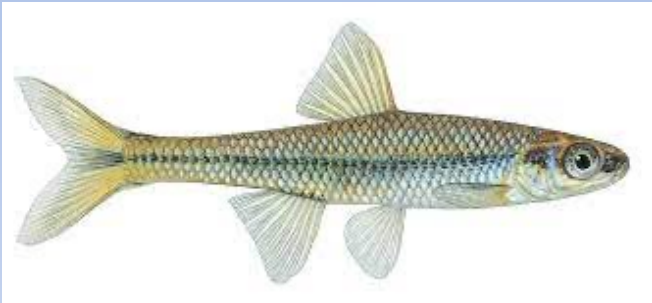
Working through an example



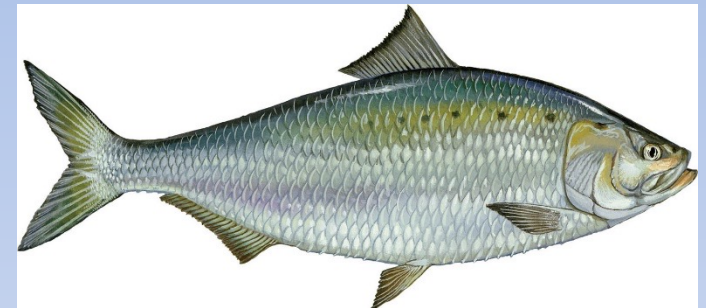
- Size: up to 60 cm (24 inches) length and 13 kg (30 pounds)
- Shape: streamlined
- Appendages:
 - single dorsal fin;
 - pelvic fins directly underneath dorsal fin
 - Forked tail



Sucker family



Minnow family



Herring family (includes the shads)



Field marks

Unpigmented (clear, unmarked) fins

Long snout



Mouth extends back
to front of eye

More challenges: hybrids

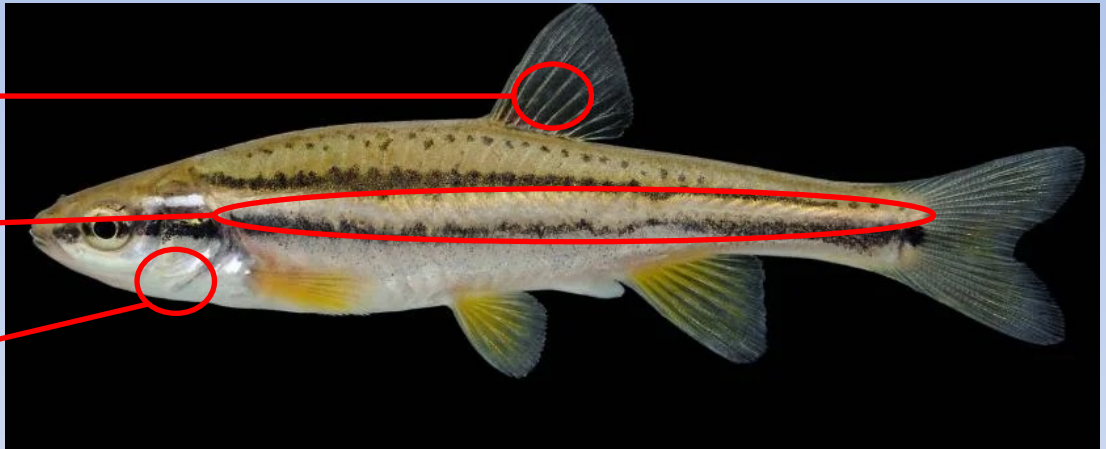
Hybrid	Species 1	Species 2
Cutbow	Cutthroat trout	Rainbow trout
Splake	Brook trout (male)	Lake trout (female)
Tiger trout	Brown trout	Brook trout
Pumpkingill	Pumpkinseed	Bluegill sunfish
Greengill	Bluegill sunfish	Green sunfish
Tiger muskellunge	Muskellunge	Northern pike
Chinoho	Chinook salmon	Coho salmon

Advanced techniques

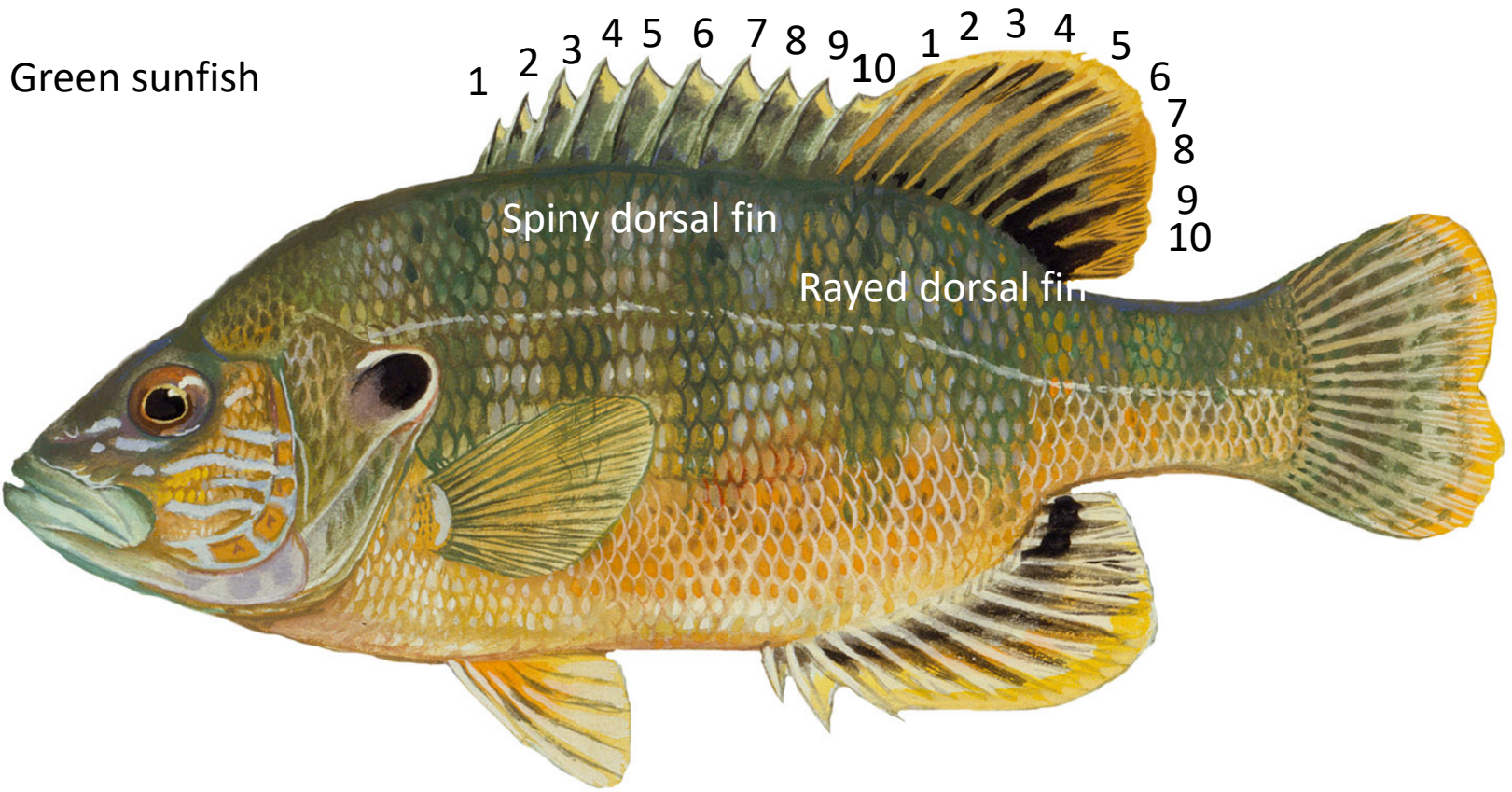
1. Fin ray counts

2. Scale counts

3. Gill raker counts



Fin ray counts



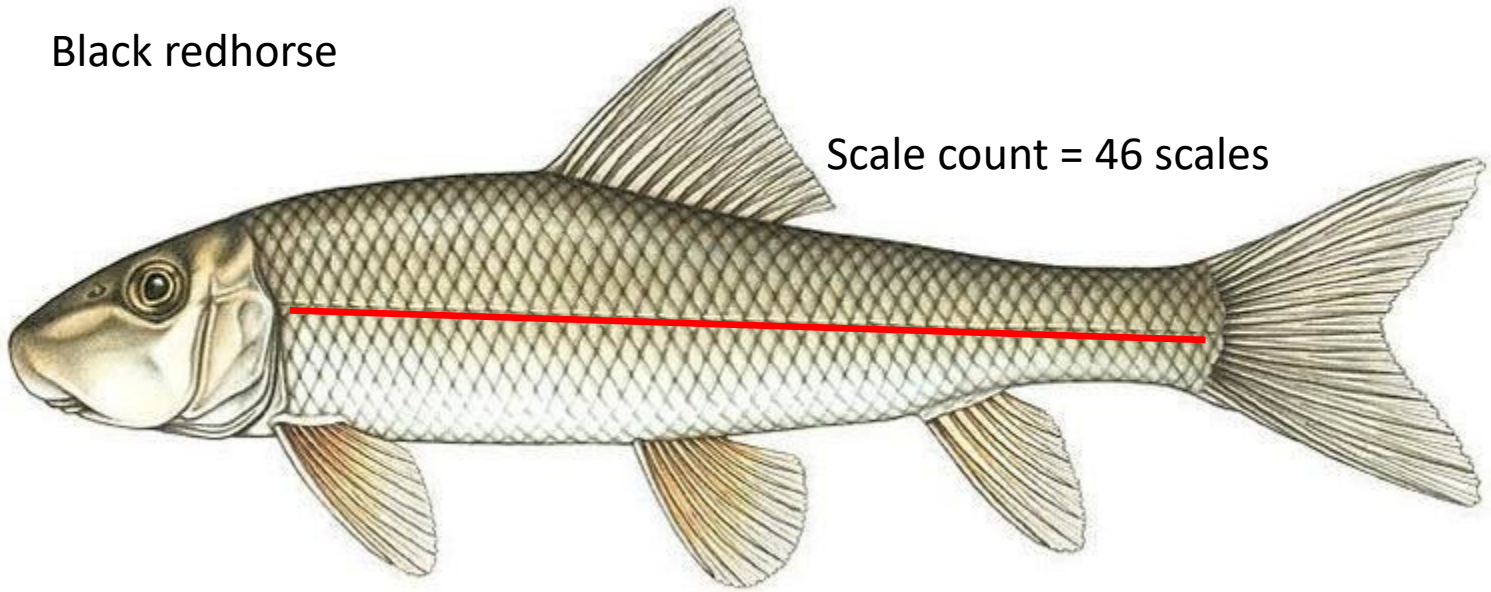
Green sunfish: 9-11 dorsal spines; 10-12 dorsal fin rays

Smallmouth bass: 9-11 dorsal spines; 13-15 dorsal fin rays

Scale counts

Black redhorse

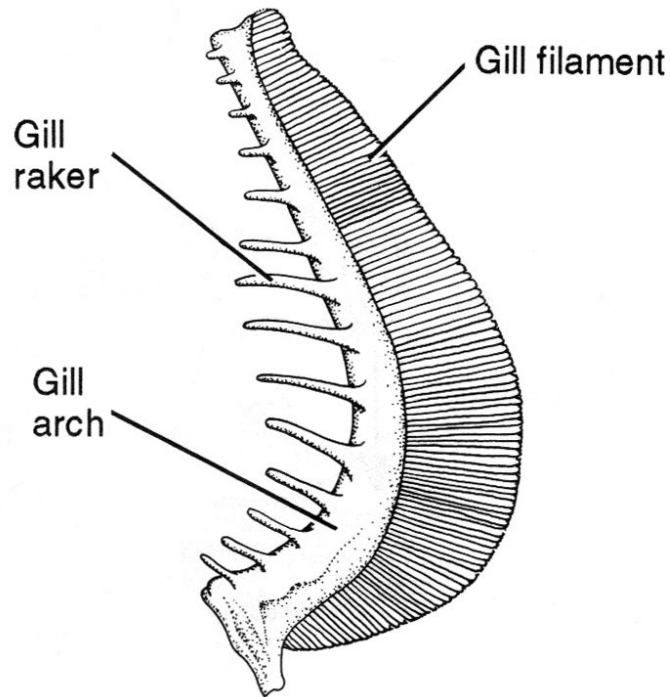
Scale count = 46 scales



Black redhorse: 44-47 scales along lateral line
White sucker: 55-80 scales along lateral line

Gill raker counts

Filter feeding fish



Non-filter feeding fish



Species	Gill rakers
Sockeye salmon	30-40 long, fine, serrated, closely spaced gill rakers on the first arch
Coho salmon	gill rakers are rough and widely spaced
Chum salmon	18 to 28 short, stout, smooth gill rakers on the first arch
Chinook salmon	Gill rakers wide-spaced and rough;
Pink salmon	26-33 gill rakers
Atlantic salmon	17-24 gill rakers

Length	Up to 150 cm (60 inches)
Body shape	Elongated (technically, esociform)
fins	1 dorsal, 1 anal, 2 pelvic, 2 pectoral
Field marks	Duck-bill mouth; spotted patterned body, single dorsal fin set at rear of body directly over anal fin, lobed spots on caudal fin
Fin ray counts	Dorsal fin 17-25 rays, 0 spines. Anal fin 10-22 rays, 0 spines. Caudal fin with 19 rays.
Scale counts	120-136 along lateral line
Gill raker count	Gill rakers present only as patches of sharp teeth on gill arches



Essential Skills 15 and 16: summary

This week we focused on:

Fish Inventory

- Five passive methods
- Three active methods

Fish identification

- Body size and shape
- Appendages (fins)
- Field marks
- Advanced techniques
 - Fin ray counts
 - Scale counts
 - Gill raker counts