Salmons, Cods, and Skates Lecture

3-week Observer Training
I. SALMON

- All have pelvic axillary process and adipose fin (distinguishes from smelts and herrings)
- Six species in groundfish fishery
- Species have distinct coloration in freshwater, but may be very similar in ocean
- Characters important in field identification:
  - Anal fin-ray count (steelhead vs. salmon) (no spines)
  - Silvering on caudal fin (silver wash vs. silver streak or none)
  - Spotting on caudal fin - where, how big, how many - VERY important but use others if tail damaged
- Body coloration and spotting
- Individual characters for each species
- Dichotomous key and species characters in Species ID Manual
Chinook Salmon
Coho Salmon
Coho Salmon

coho

Chinook
Chum Salmon
Chum Salmon
Sockeye (red) salmon
Sockeye (juvenile)
Pink (humpy) salmon
Steelhead
II. INTRODUCTION TO CODS

- Cods can be split into 2 categories:
  - true cods (3 dorsal fins, 2 anal fins, all soft rays)
  - hake (2 dorsal fins, 1 anal fin)
- Important characters:
  - projection of lower jaw - which jaw most anterior
  - presence of and length of chin barbel - relative to pupil in key, not eye
  - position of anus relative to dorsal fins - under 1st or b/w 1 and 2
  - configuration of LL (interrupted or not)
Walleye pollock
Pacific cod
Walleye pollock

Pacific cod
Pacific tomcod
Saffron cod
Pacific hake
Skate anatomy

VENTRAL
- pectoral fin
- pelvic fin
- gill slits
- alar hooks
- malar hooks
- clasper (male)
- dorsal fins
- orbital thorns (O)
- nuchal thorns (N)
- mid-dorsal thorns (D)
- scapular thorns (S)
- caudal fin

DORSAL
- precaudal length
- tail length
- disc width
- snout length
- snout flexible
- pectoral radials nearly reaching snout cartilage

Bathyraja
- pectoral radials not reaching snout cartilage
- snout stiff

Raja
**Raja binoculata**  big skate

**Diagnosis**: The only Alaskan species of *Raja* with the following combination of characters: anterior margin of disk concave; posterolateral margin of pelvic fin slightly concave; and base of pectoral fin with large ocellus surrounded by light spots.

**Denticles**: Fine denticles on dorsal surface; ventral surface smooth.

**Coloration**: Dorsal surface brown, gray-brown or reddish brown, often with large ocellus surrounded by smaller spots on pectoral fin; ventral surface white to light gray.

**Body Shape**: Disc wide, somewhat diamond-shaped, with concave anterior margin; posterolateral margin of pelvic fin slightly concave.

**Juveniles**:

- **Maximum Size**: 244 cm
- **Range**: SE Bering Sea to California
- **Depth**: 23-800 m
Big skate

MALE

FEMALE

ventral
Bering skate

MALE

FEMALE

ventral

N
S
(D)

0-2w
Aleutian skate

MALE

FEMALE

ventral

N  S   D  1-2s
Bering skate vs. Aleutian skate
Mud skate

MALE

FEMALE

ventral
Whiteblotch skate

MALE

FEMALE

ventral

N

0-1w
Commander skate

MALE

FEMALE

ventral

N  D
Roughtail skate
Whitebrow skate

MALE

FEMALE

ventral

(N)
Rare Skates – Retain These For Confirmation!!

Deepsea skate

Roughshoulder skate