

## LECTURE 2 - OUTLINE



### Diversity & General Morphology I

#### 1. Introduction

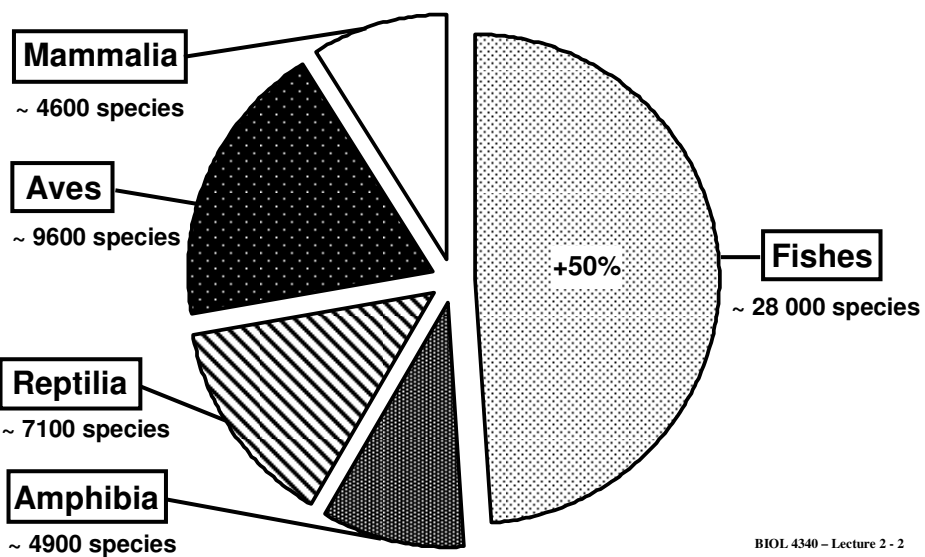
- Species representation
- Water
- Species distribution

#### 2. General Morphology

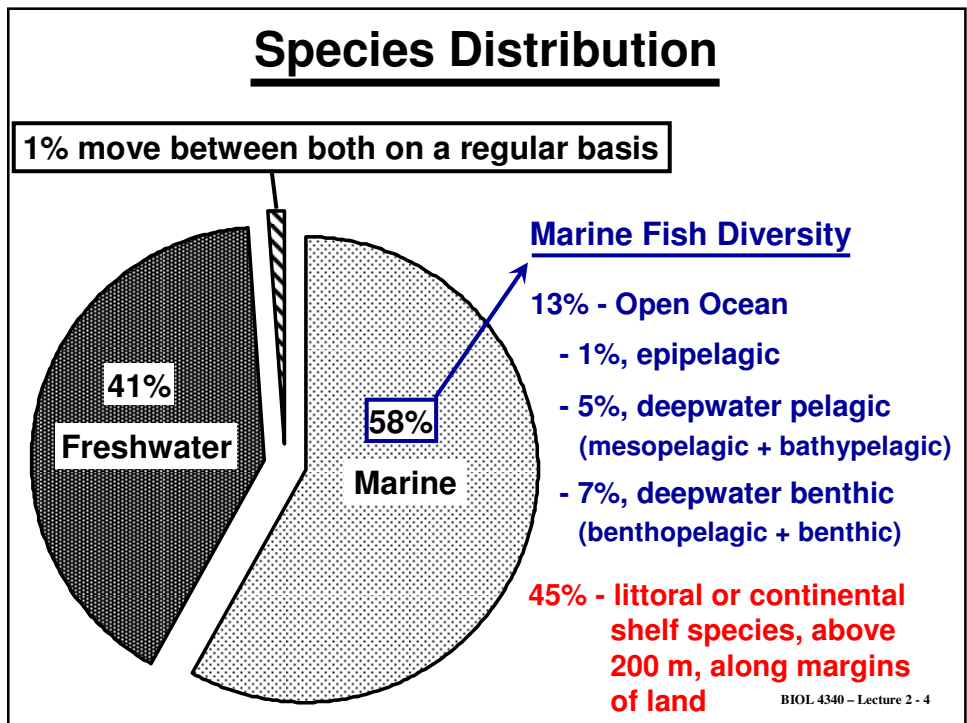
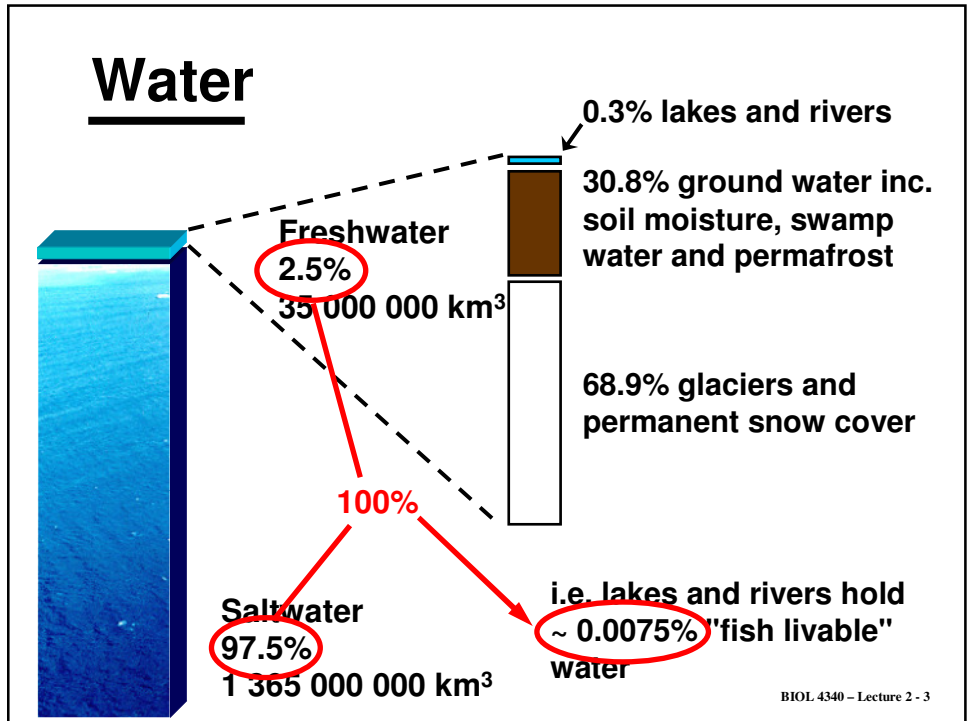
- Body form
- Fins
- Scales

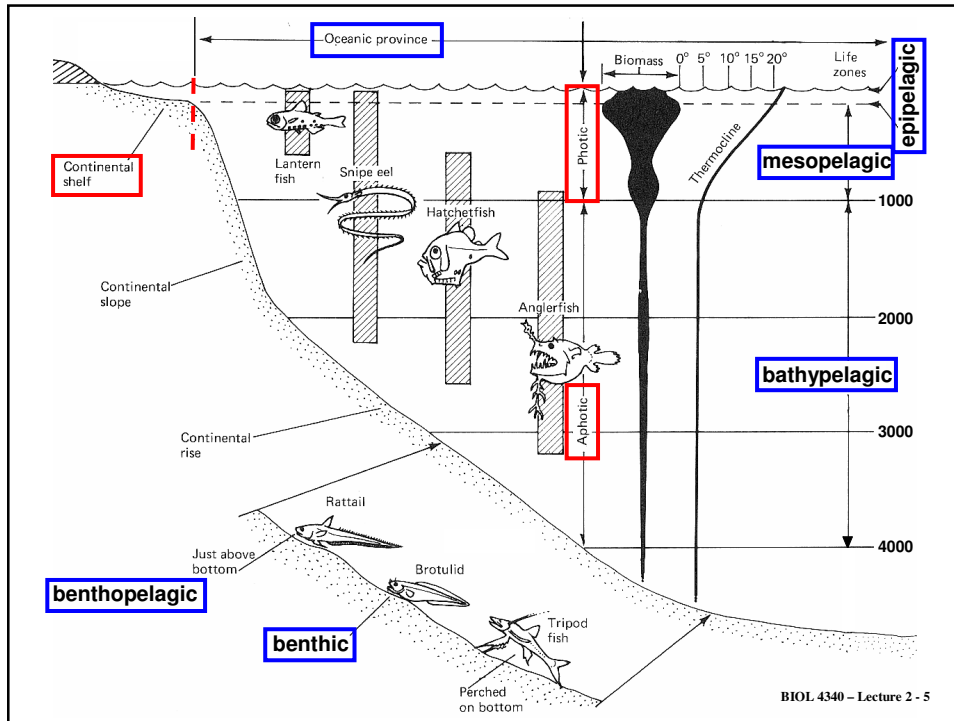
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## Species Representation



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## General Morphology – Body Form

**Body Form**

X.S.

**Fusiform**

- streamlined (fast swimmers)
- elliptical or round X.S.
- narrow caudal peduncle
- tuna, + examples

**Compressiform**

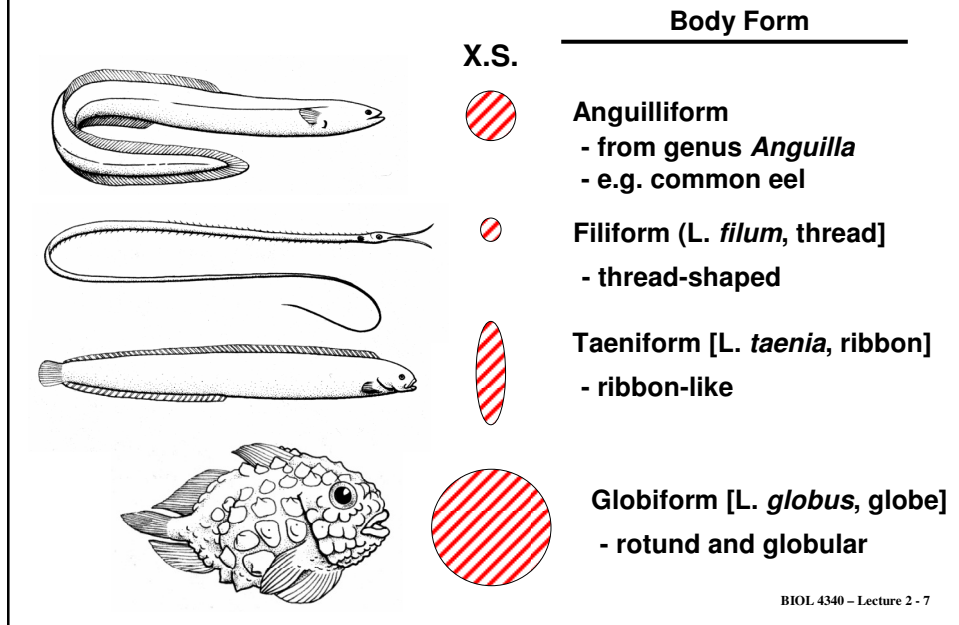
- compressed laterally
- deeper body
- not constantly in motion
- capable of burst speed
- sunfish, flounder + examples

**Depressiform**

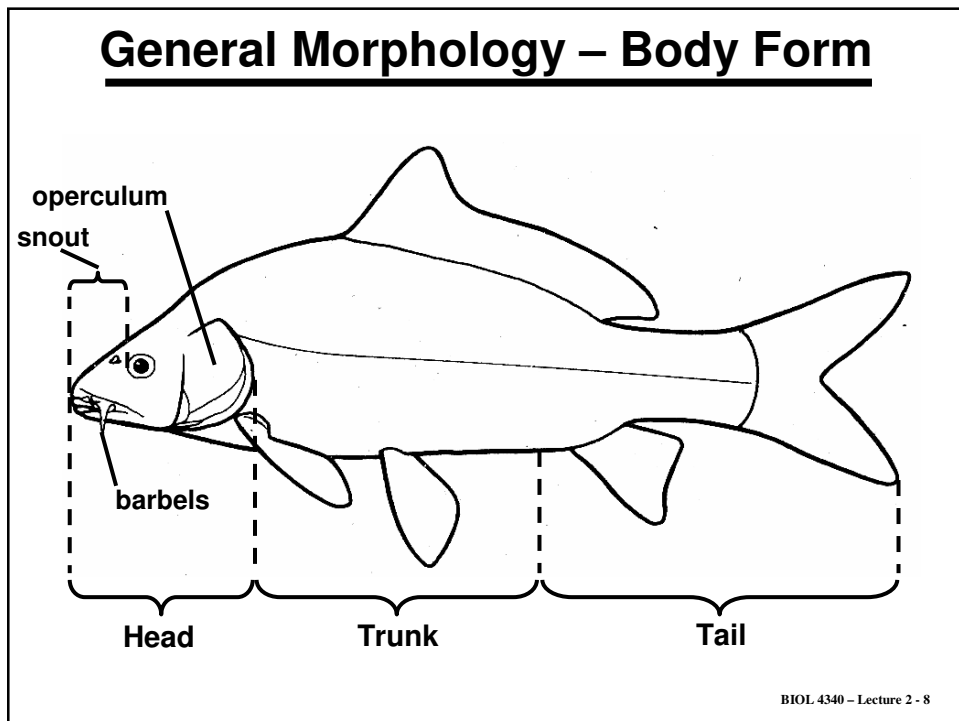
- dorsoventrally flattened
- mostly benthic
- skates, + examples

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## General Morphology – Body Form



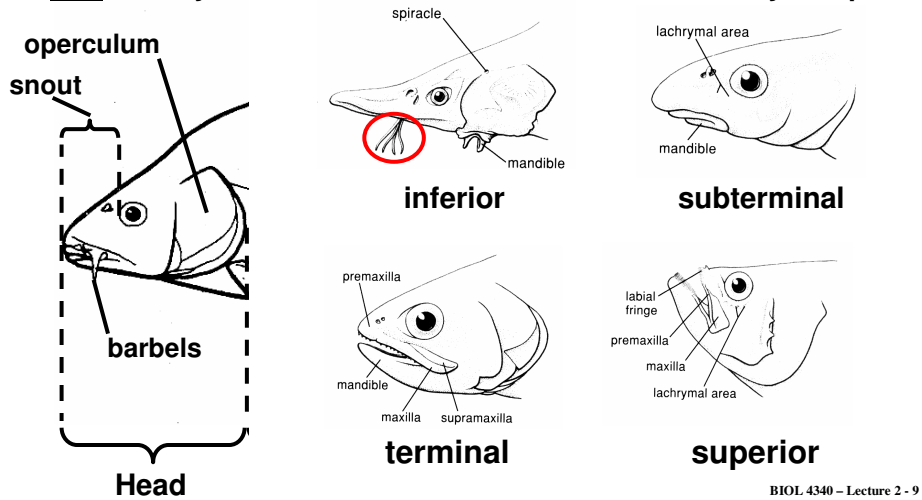
## General Morphology – Body Form



## General Morphology – Body Form

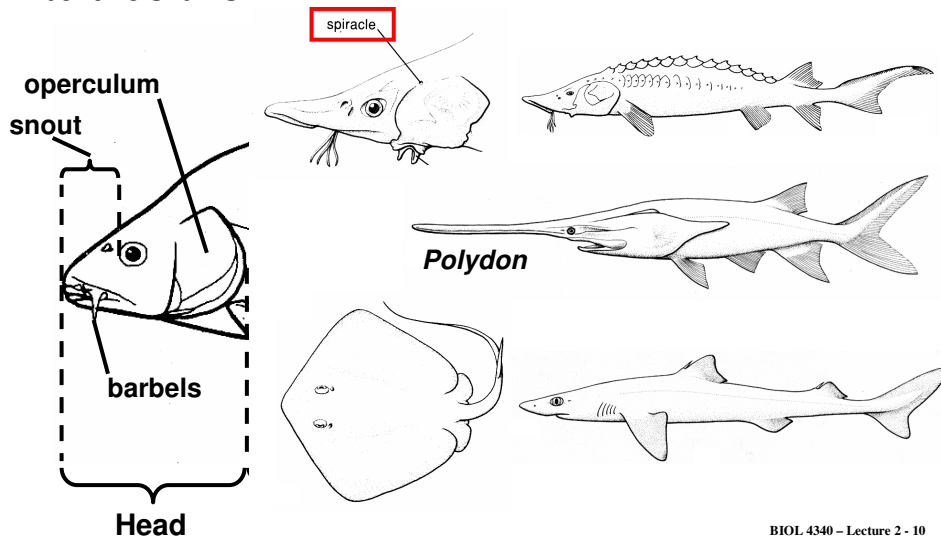
**barbels** - fleshy elongate structures, carrying tactile and chemosensory receptors

**cirri** - fleshy structures without tactile & chemosensory receptors



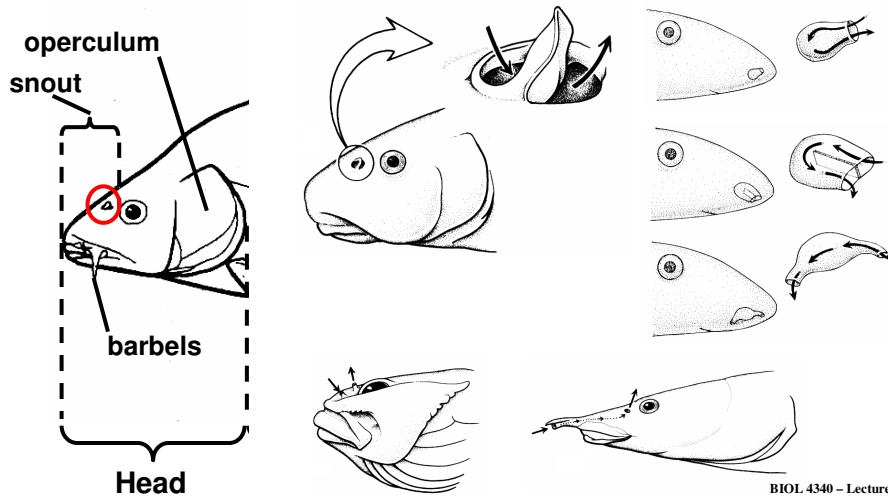
## General Morphology – Body Form

**spiracle** – remnant gill slit, "functional" in benthic rays and some benthic sharks



## General Morphology – Body Form

- nares** - opening to blind ended nasal sac with olfactory epithelium  
 - nare(s) open to oral cavity in a few species



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## General Morphology – Fins

### Median Fins

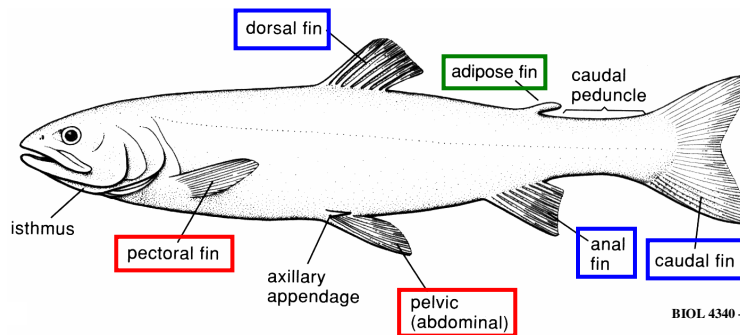
- unpaired fins (dorsal, caudal & anal)
- supported by median elements assoc. with the axial skeleton

### Paired Fins

- pectoral and pelvic fins, supported by appendicular skeleton

### Adipose Fin

- small, fleshy, usually rayless fin on dorsal side of caudal peduncle

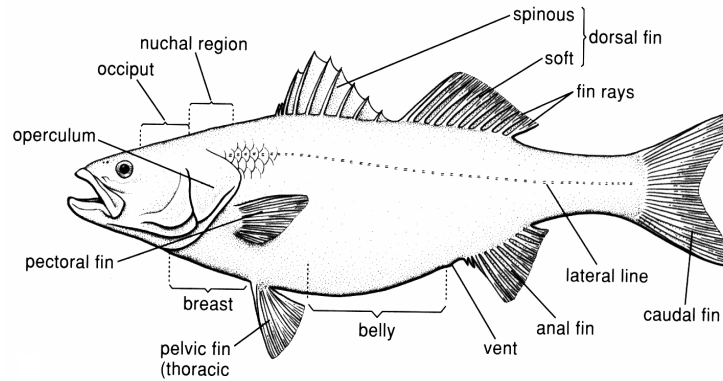


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## General Morphology – Fins

### Dorsal Fin

- stabilizing function (prevents yawing); facilitates direction change
- extend length of body, be divided into 2 - 3 portions or be absent
- anterior portion (or first portion) spinous in derived fishes



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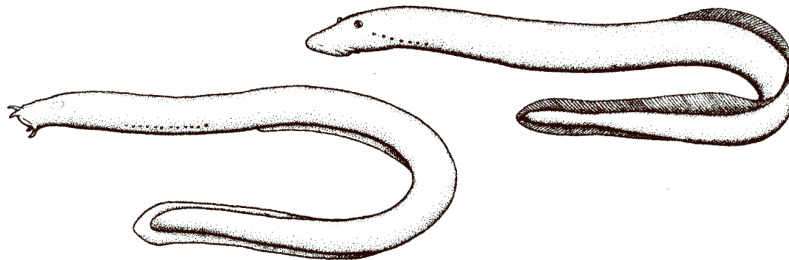
## General Morphology – Fins

### Caudal Fin

- internal structure often reflects phylogenetic relationships

#### Protocercal tail

- primitive undifferentiated caudal fin
- asymmetrical/symmetrical
- agnathans, larval fish (also lancelets)

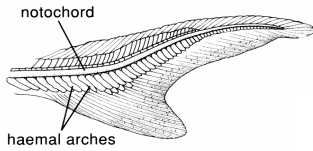


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# General Morphology – Fins

## Caudal Fin

- internal structure often reflects phylogenetic relationships

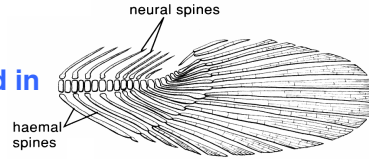
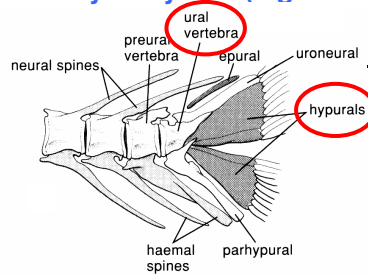


### Heterocercal tail

- vertebral column turns up to end in longer upper lobe (e.g. sturgeon)

### Hemihomocercal tail

- intermediate/transitional form found in early bony fish (e.g. *Amia*)



### Homocercal tail (abbreviated heterocercal)

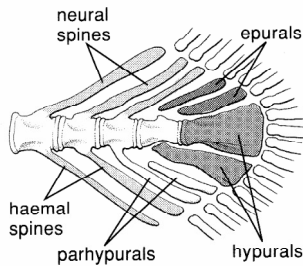
- externally, appears symmetrical  
- internally asymmetrical due to inflexion of ural vertebra

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# General Morphology – Fins

## Caudal Fin

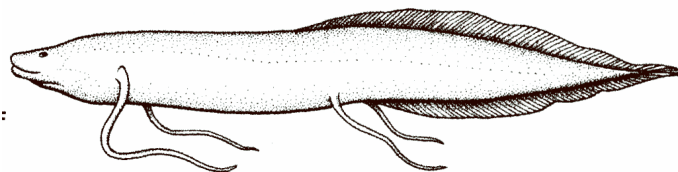
- internal structure often reflects phylogenetic relationships



### Isocercal tail

- externally, appears symmetrical  
- internally “more symmetrical”, i.e. no inflexion of ural vertebra

### Diphycercal (leptocercal) tail - symmetrical form

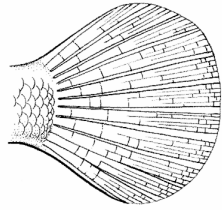


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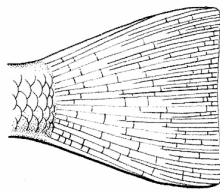


# General Morphology – Fins

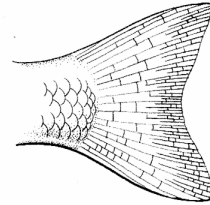
## Caudal Fin



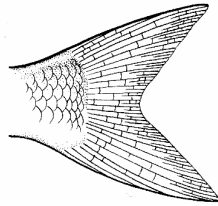
**1. rounded**



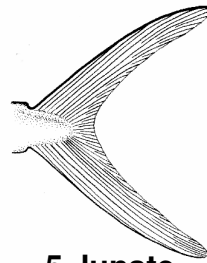
**2. truncate**



**3. emarginate**



**4. forked**



**5. lunate**

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