

Starry Flounder's Wandering Eye

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and

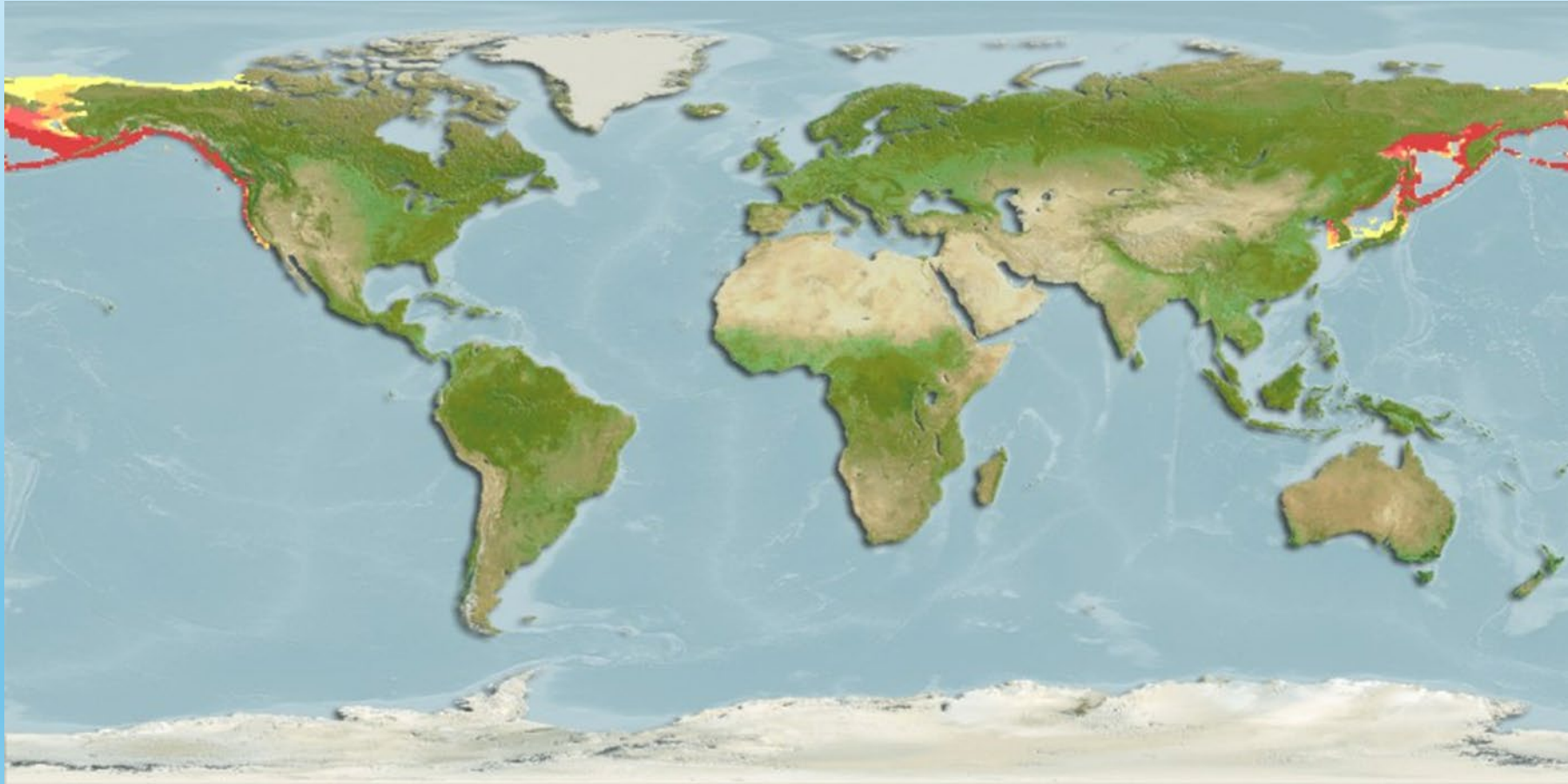
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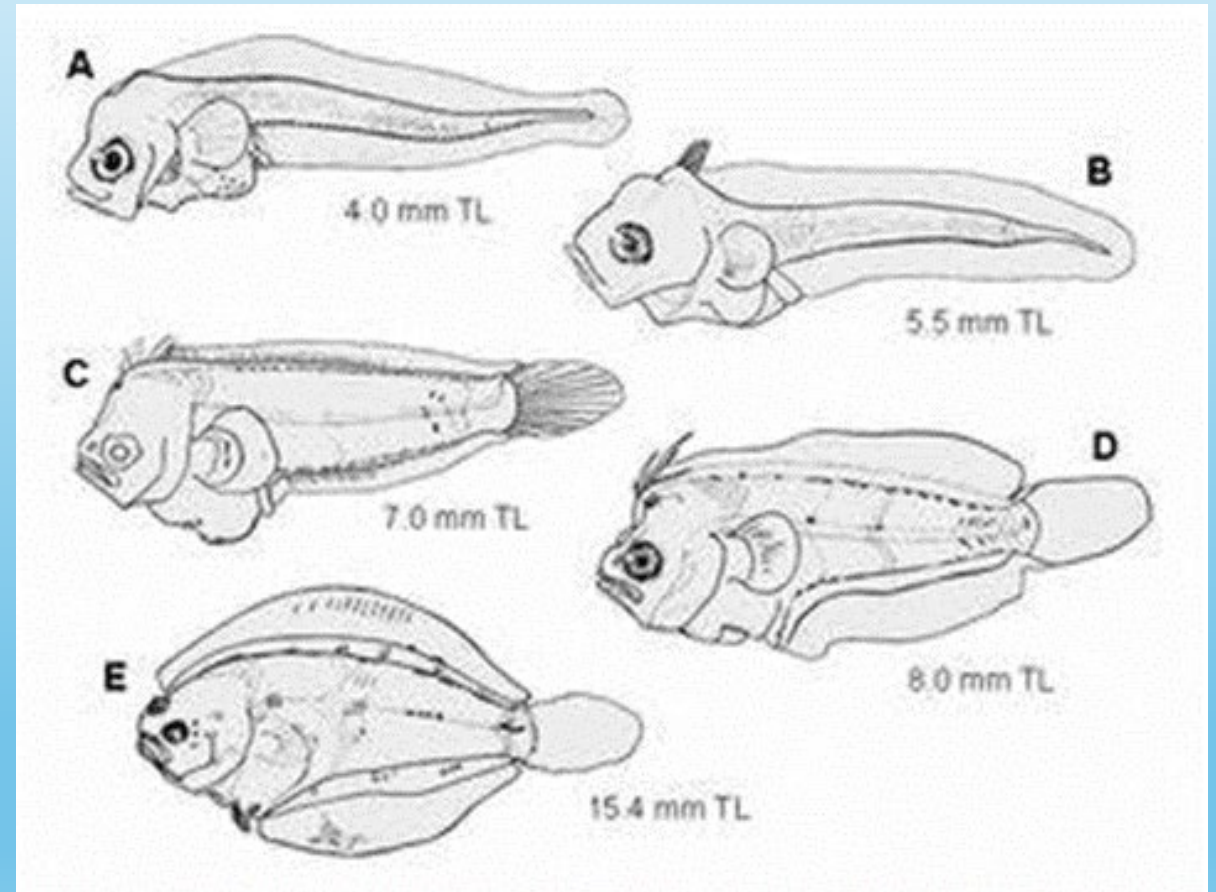


Range along North Pacific Rim from Korea to California



Life Cycle

- Larvae hatch with typical rounded, vertical, streamlined appearance
- One eye migrates to other side of head within 24 days of hatching.
- Other larvae body changes are
 - Development of pterygiophores (cartilaginous element) to support median fin rays
 - Pigmentation changes
 - Dark above, light below
 - Black stripes on dorsal and anal fins
 - Fin rays replaced with lepidotrichia (fin rays)
- Smallest morphed fish was 10.5 mm.
- At 15 mm, eyes completed migration
- Larval period is 2-3 months, January-March. But metamorphosis can occur as quickly as 1 month, even faster in warmer water temperatures.



Orcutt 1950

Continued Changes from Juveniles to Adult

- Head and eyes decrease in size
- Snout grows longer
- Mouth gets slightly larger
- By 250 mm, surface scales are lumpy and star-shaped.



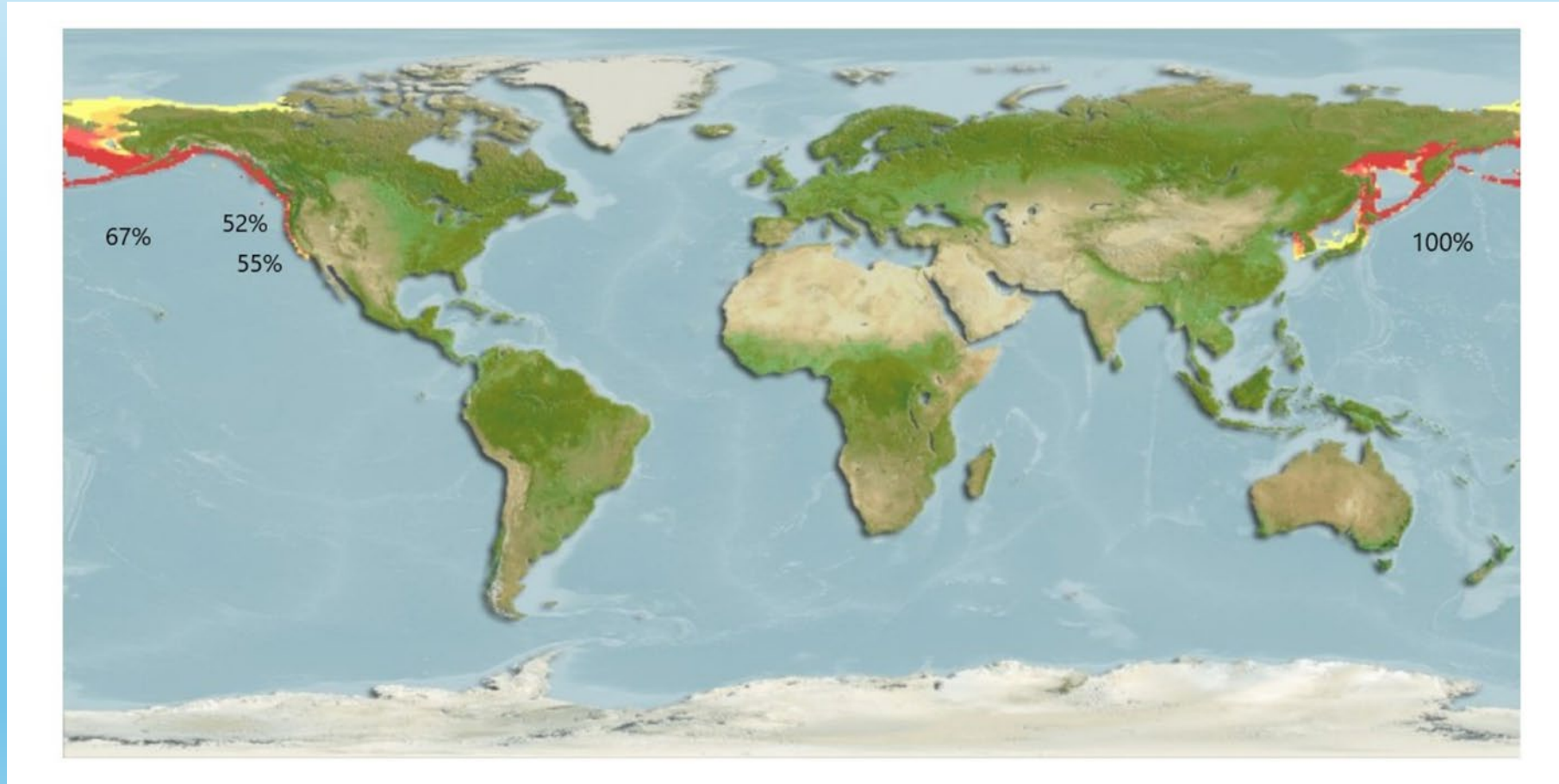
Animalia

Right vs. Left Side Eyes

- Starry flounder is in Pleuronectidae, known as the right-eyed (dextral) flounder family.
- Most starry flounder are left-eyed (sinistral)
- There's no significant differences in sinistral and dextral forms in male and female fish.
- There are geographic differences in frequency of forms.



Composition of Sinistral Eyes Starry Flounder



Data from Orcutt (1950)

Right vs. Left Side Eyes

- Currently no biological evidence of distinct geographical heterogeneity indicating a particular stock structure (e.g., genetic, growth, or natural mortality)
- Assumption U. S. west coast starry flounder belong to common breeding population with similar biological characteristics (Ralston 2005)



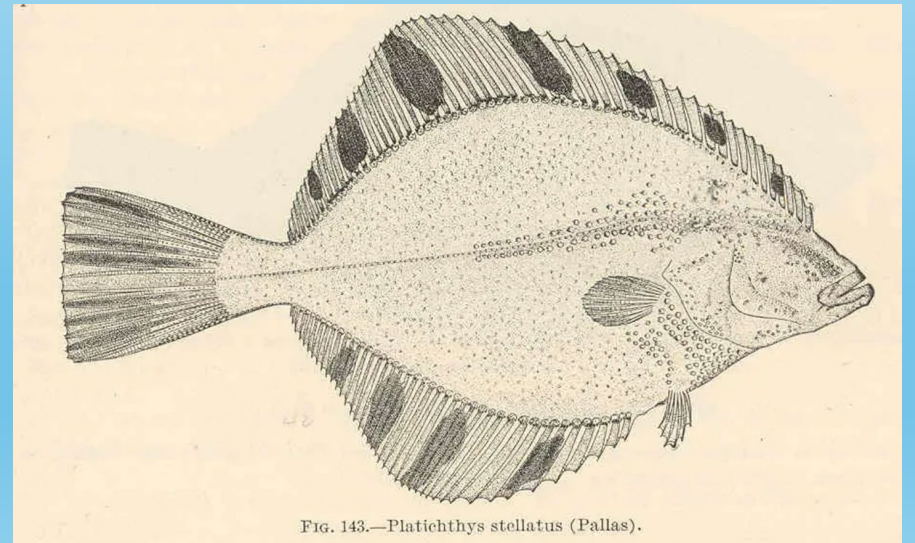
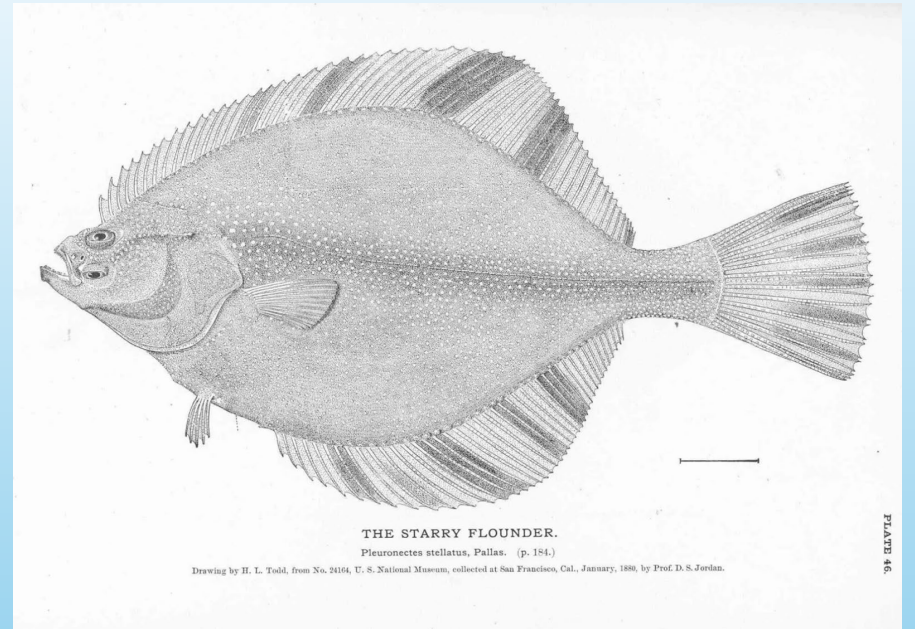
Right vs. Left Side Eyes

- Bergstrom and Palmer (2007) studied foraging behavior in dextral and sinistral eyes forms and detected some differences in turning angle and prey strike orientation.
- Dextral fish have eyes significantly closer to the dorsal midline than sinistral fish.
- Sinistral fish had more dorsally orientated prey strikes and this difference increased with fish body size.
- They concluded the forms are not simple behavioral mirror images of one another and therefore may differ ecologically.



Summary

- Starry Flounder are distributed along the northern Pacific Rim.
- Larvae undergo a dramatic metamorphosis with first month.
- There are dextral and sinistral varieties.
- While 100% sinistral on western rim, closer to 50% on eastern rim.
- We assume U.S. west coast Starry Flounder population is a common breeding population.
- Differences in prey strike behavior may indicate an ecological influence.



H.L. Todd, 1880