





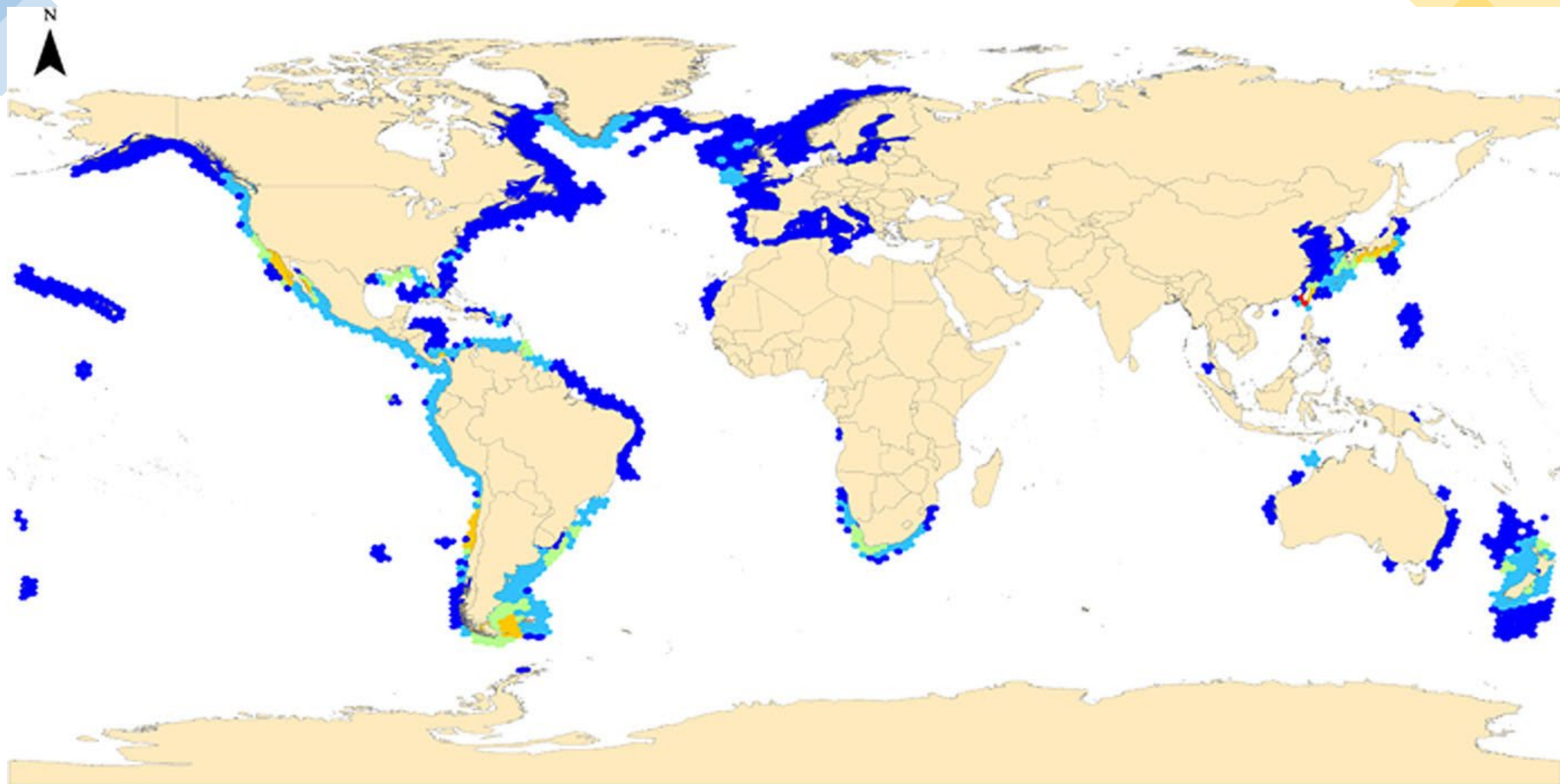
**Pacific Hagfish  
off the Oregon  
Coast**

# Pacific Hagfish (*Eptatretus stoutii*)

Family: Myxiniidae (5 Genera, ~60 – 70 spp worldwide)

- No scales, jaws, true eyes, vertebrae, or paired fins (but has a skull)
- One nostril, one gonad
- Four hearts



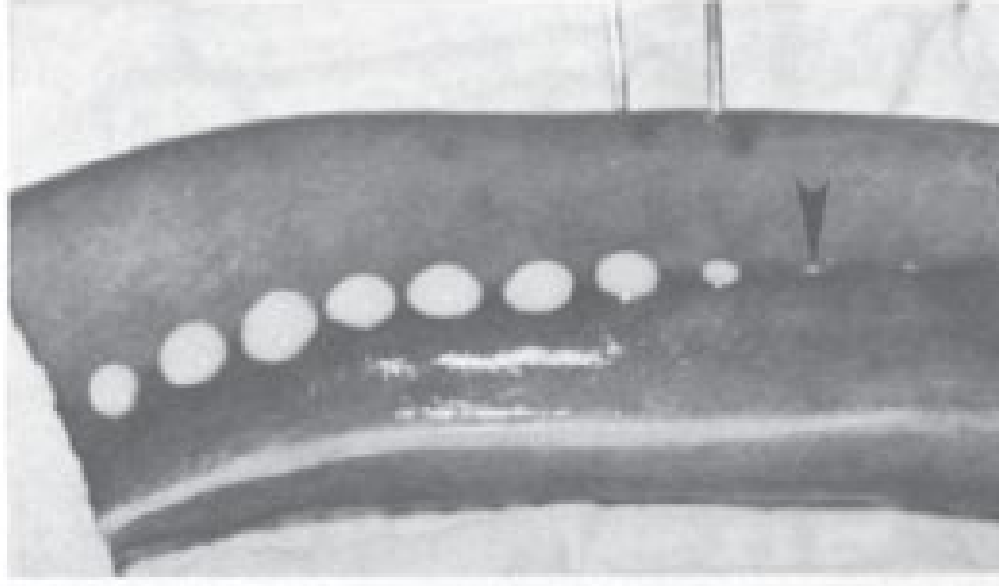


Total number of species (per 10km grid)





120 *Hagfish skin and slime glands*



Spitzer and Koch. 1998. *In* The Biology of Hagfishes. Edited by Jorgen Morup Jorgensen, Jens Peter Lomholt, Roy E. Weber and Hans Malte.







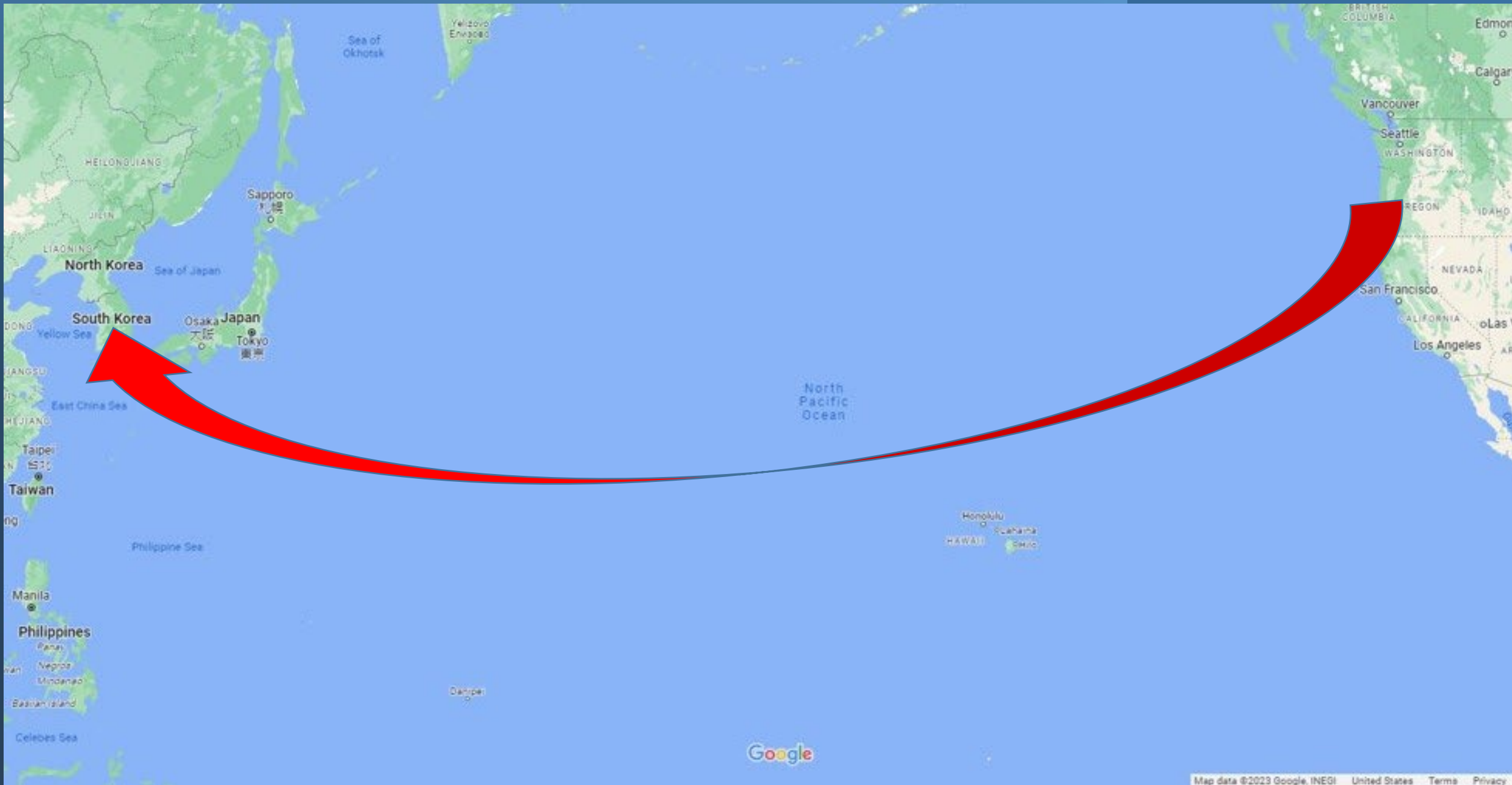


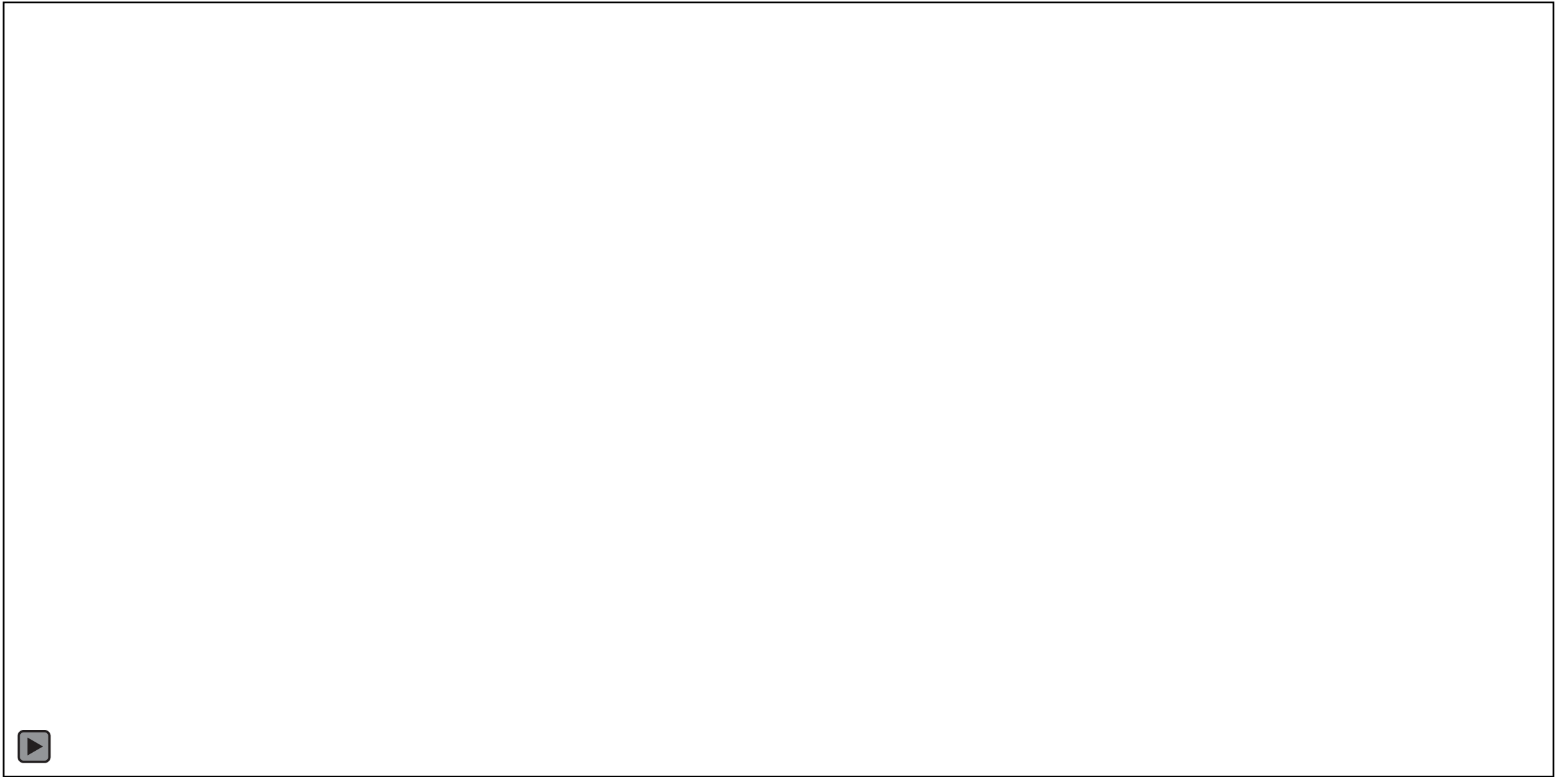








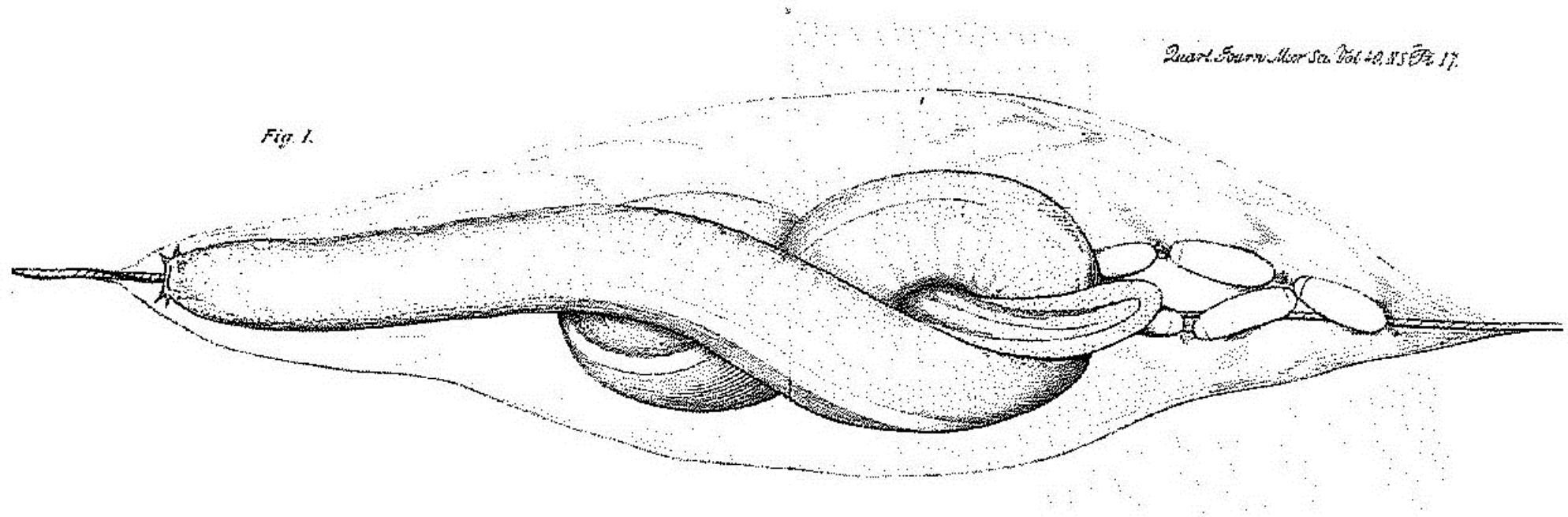




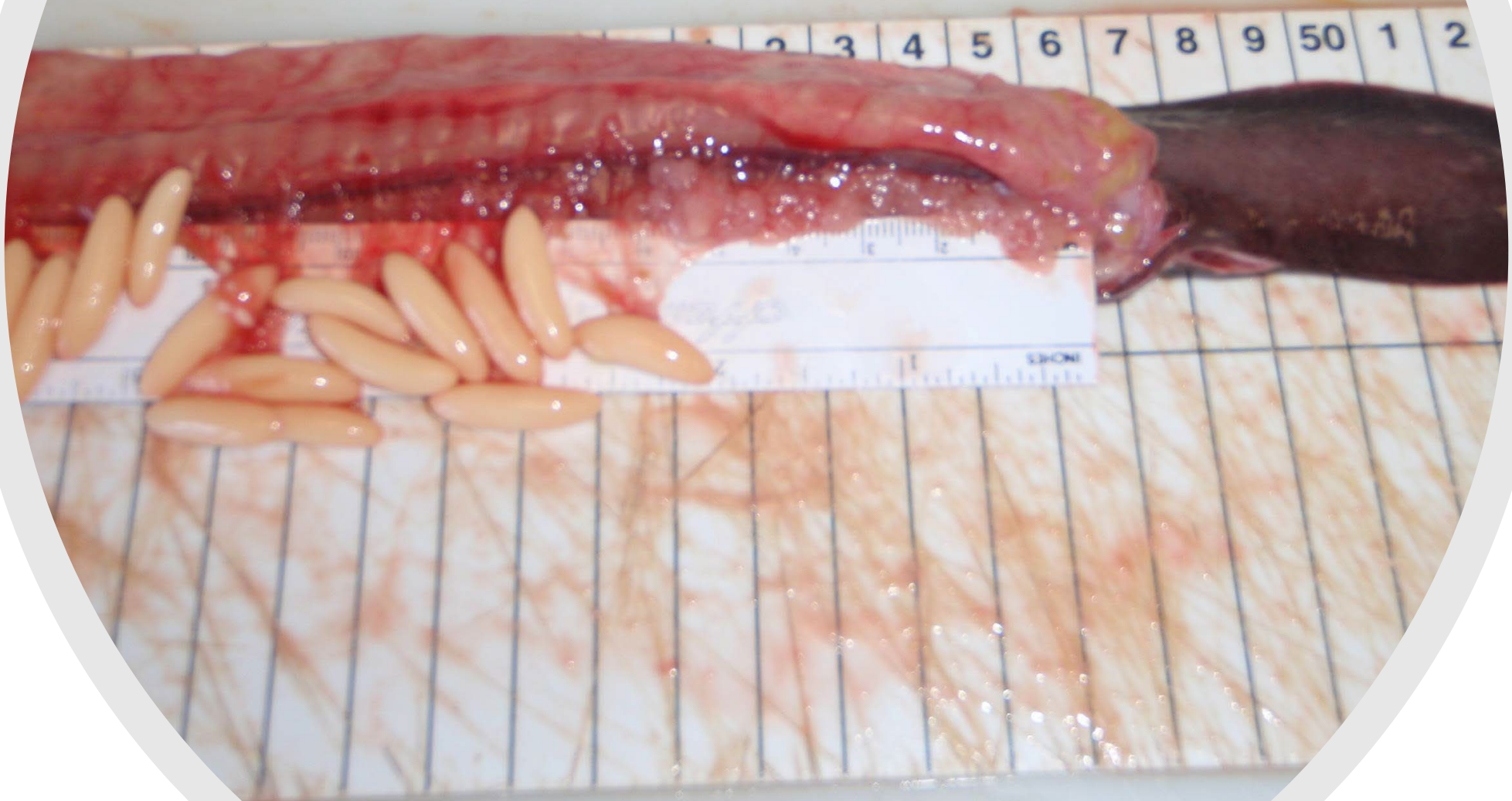
# Pacific hagfish life history

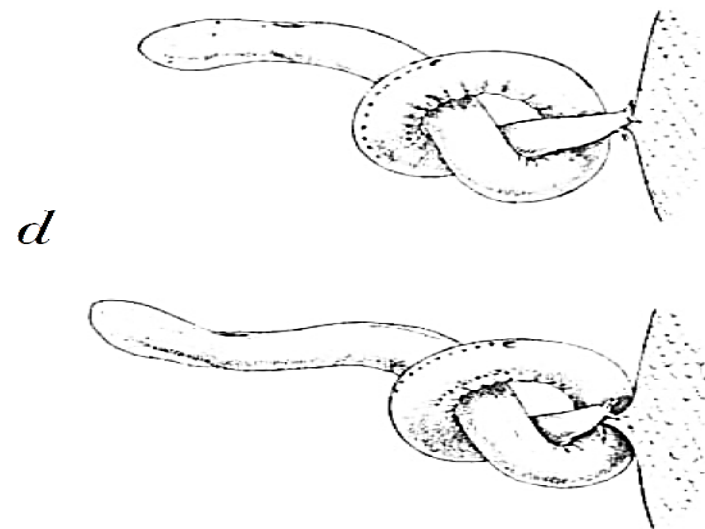
- Produce about 25 eggs per cycle
- Capture depth ~ 91 – 219 m over muddy bottom
- Can live to be at least 25 yrs old
- Growth estimates range from 1-4 cm/yr
- Mature between 8-12 yrs old
- Maximum size 67 cm
  - No larva has ever been observed. Embryos, yes. Once. A hundred years ago in Monterey Bay.





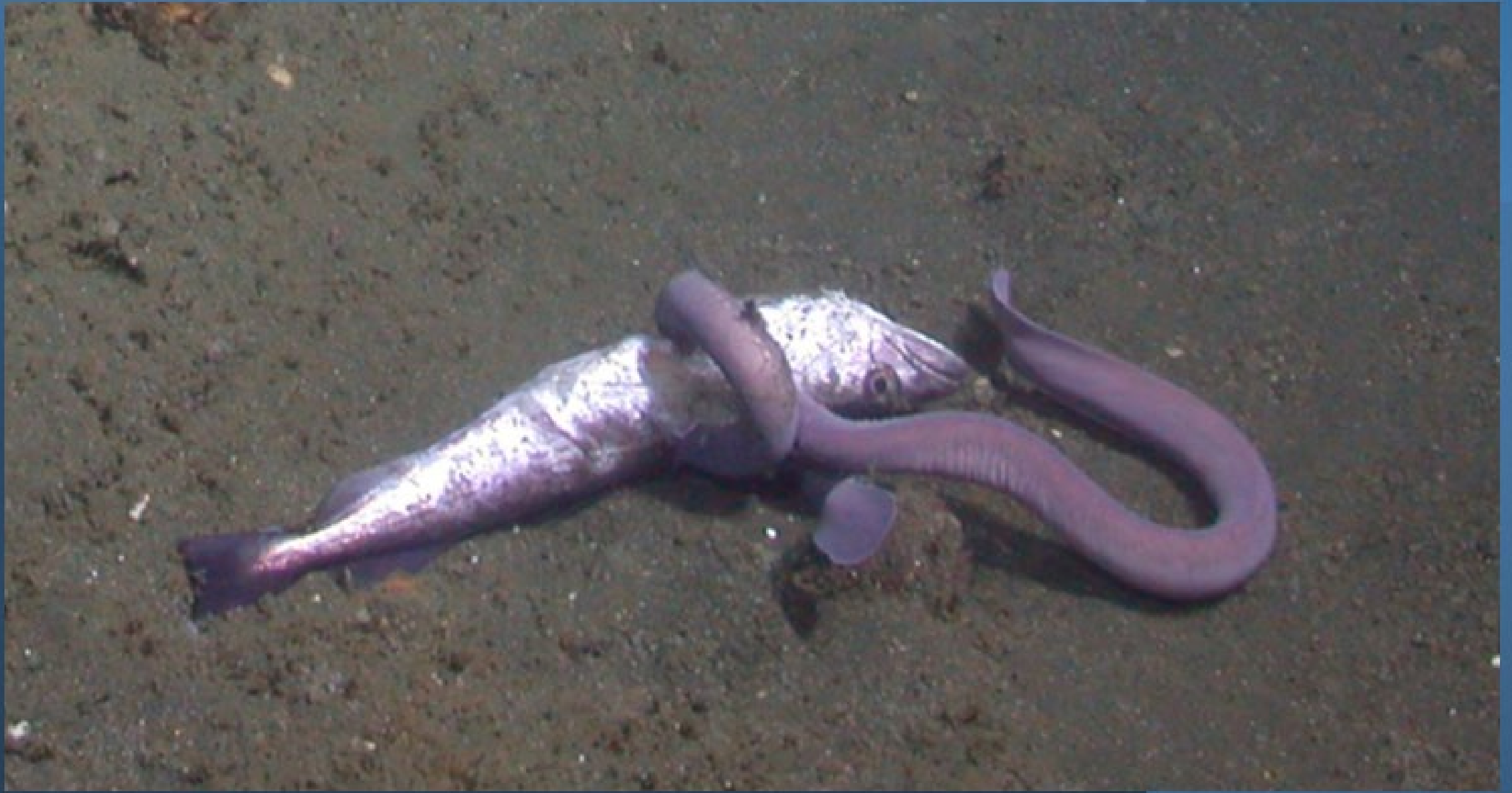
**Fig. 1.** This drawing by Bashford Dean (1899) depicts a hagfish freshly caught on a hook. The fishing line shows in front and behind the animal. The stressed hagfish has extruded a quantity of slime around itself as well as about 5 eggs that are linked to each other by their anchor hooks.





Jensen, D. 1966. Scientific American, V214:82-91





# Current Oregon Management

- Open Access Fishery
- Gear - 200 trap gear limit, escape mechanism (holes in trap) required
- Market-driven minimum size ~35 cm
- 1.6 mill lb “harvest guideline”
- Logbook required
  - Some non-compliance issues, resolution underway. Sort of. Frustrating.



“Open  
Access”  
means you  
need a boat  
and a license.

Maybe not  
be at all  
queasy...



...and Buckets.  
Lots.









# Market History

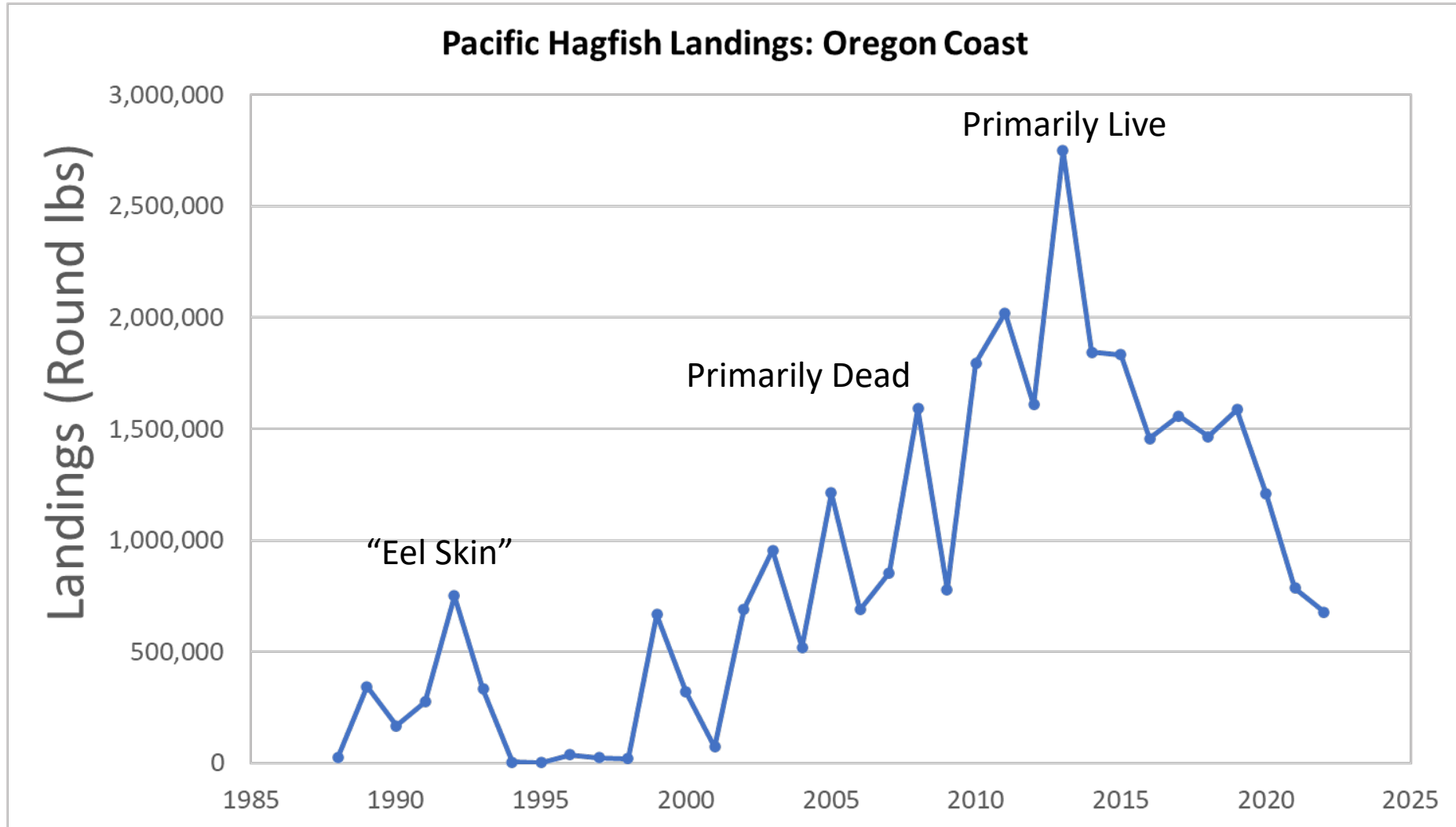
- “Eel Skin” in early 90’s
- Became a “Developmental Fishery” in 1995, since suspended
- Transition to a food fishery late 90’s
  - Primarily landed dead but live landings began in 2008; live fish landings dominate catch beginning in 2010 (80 – 90%)
- Primary market Korea (popular as street food)
- Recent increasing competition
  - Vietnamese Fishers: “Larger fish, tastier”
- Recent ex-vessel value ~\$1.5M/yr



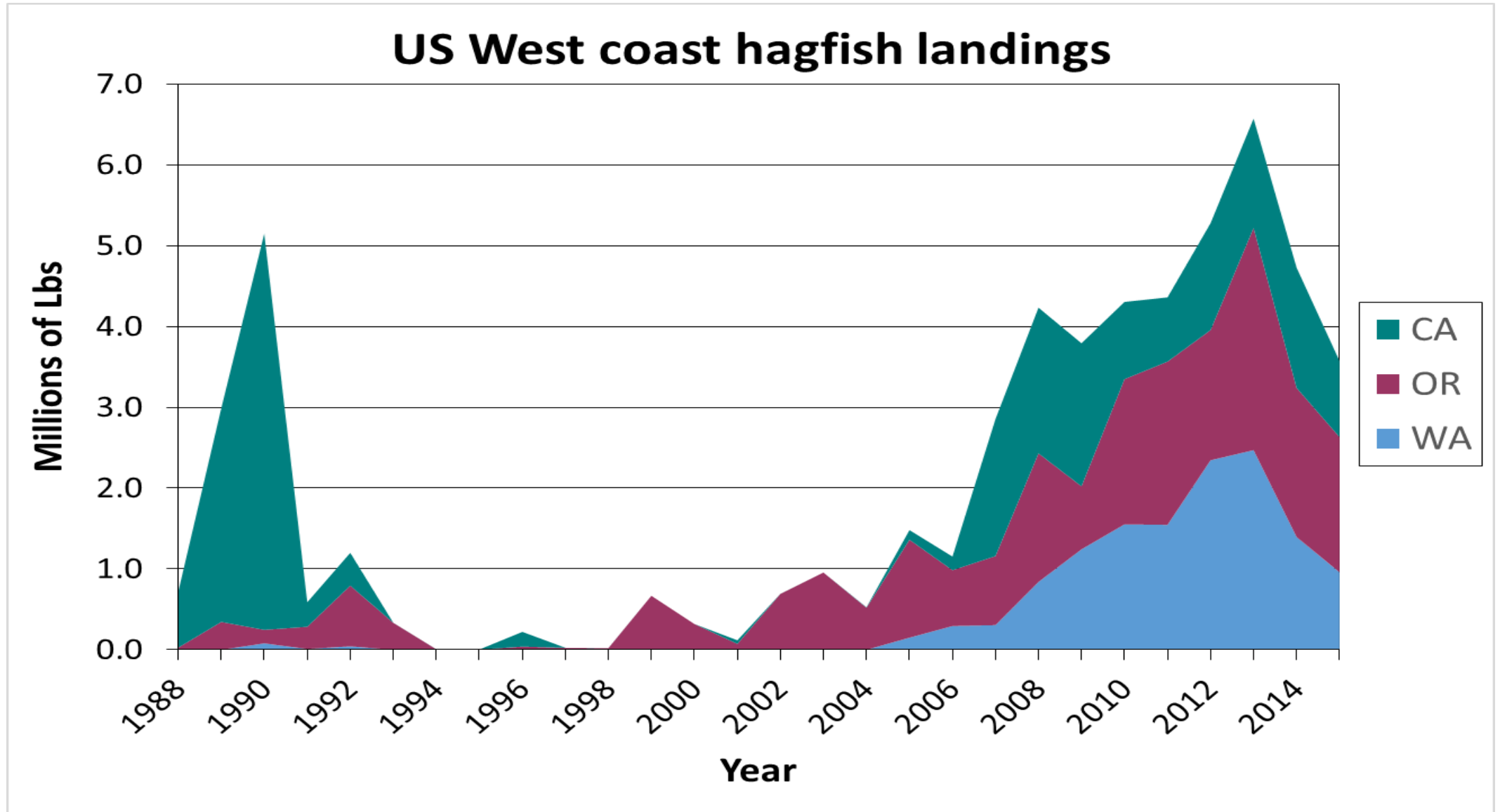
# Fishery Monitoring by MRP

- Length, weight, sex, maturity
- Where/when caught
- Where/when landed
- For how much

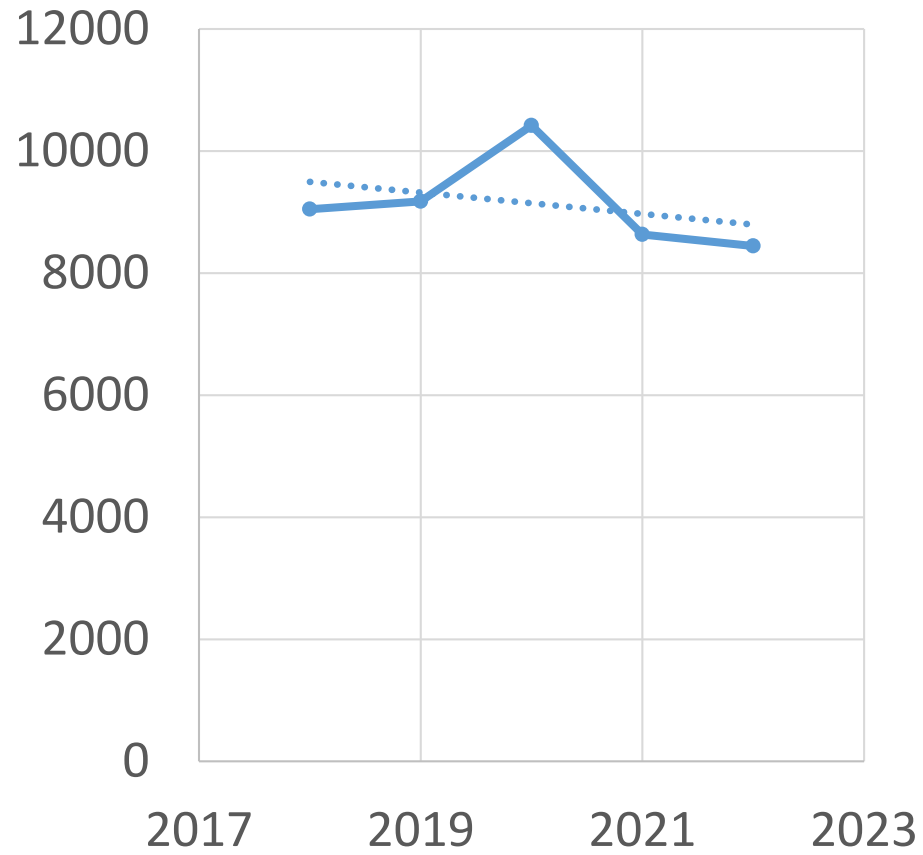
# Fishery Stats



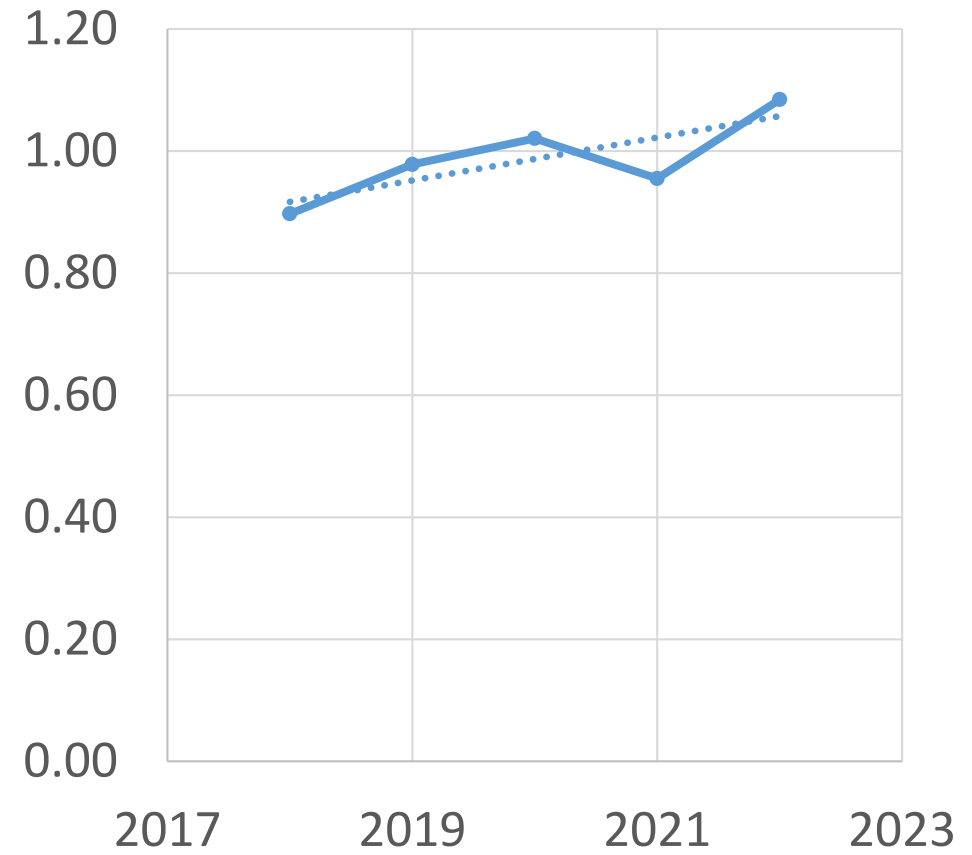
# Fishery Stats



Ibs/trip (CPUE)



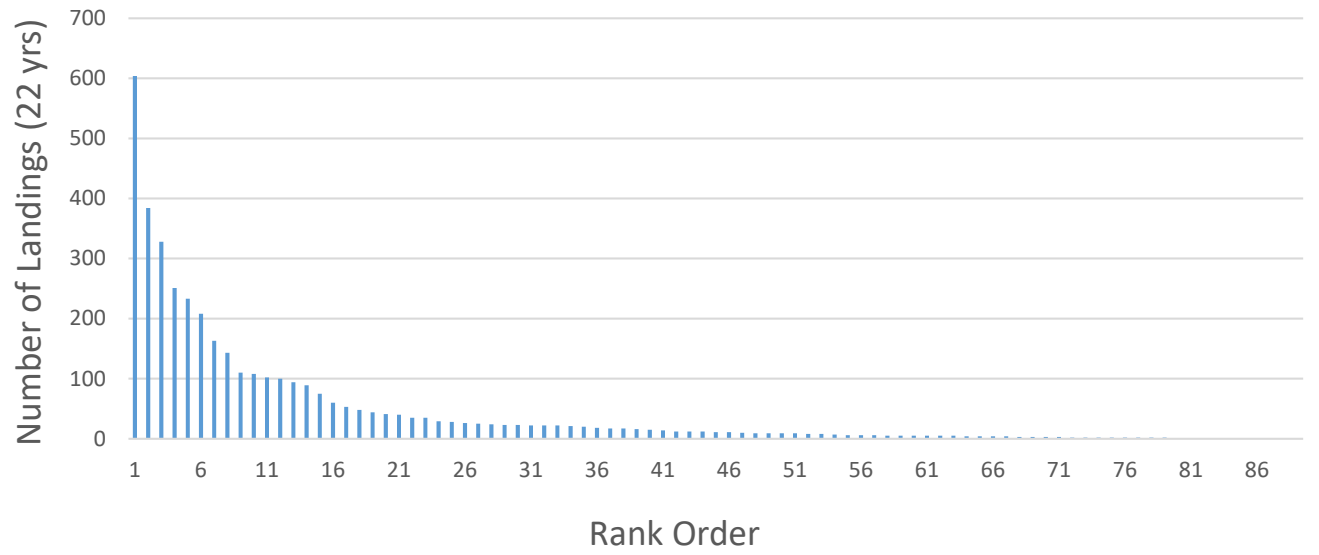
Mean Price/lb



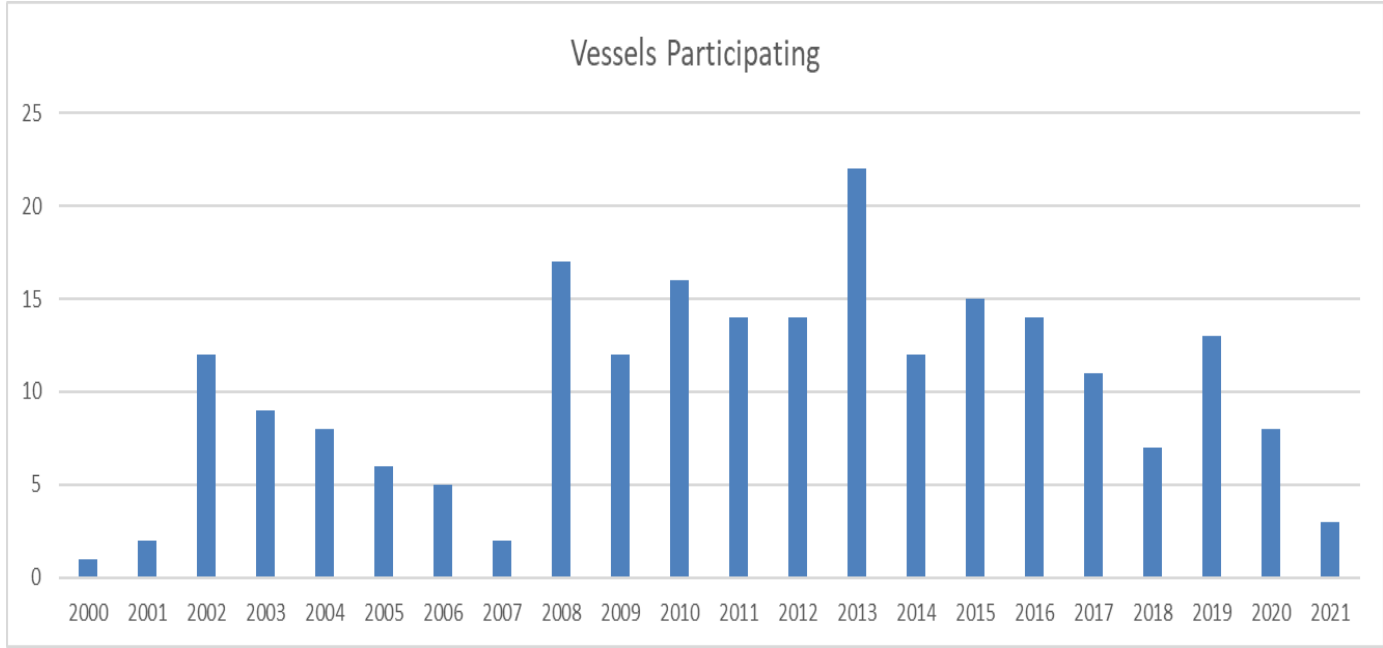


VESSEL	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	118	71	77	59	30	31	2	40	41	25	42	18	2			27	25					
2											30	20	29	36	35	42	44	43	31	42	27	2
3									23	63	77	54	35	21	21	14	10	20	2	7		
4											29	40	43	21	36	35	31	16				
5											55	48	2	29	34	25	33	7				
6															6	55	33	36	24	21	32	1
7											7	36	48	32	30	10						
8											18	63	22	8	23	9						
9										2	61	28		18								
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11																						
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Landings per Vessel: 2000 - 2021



Vessels Participating

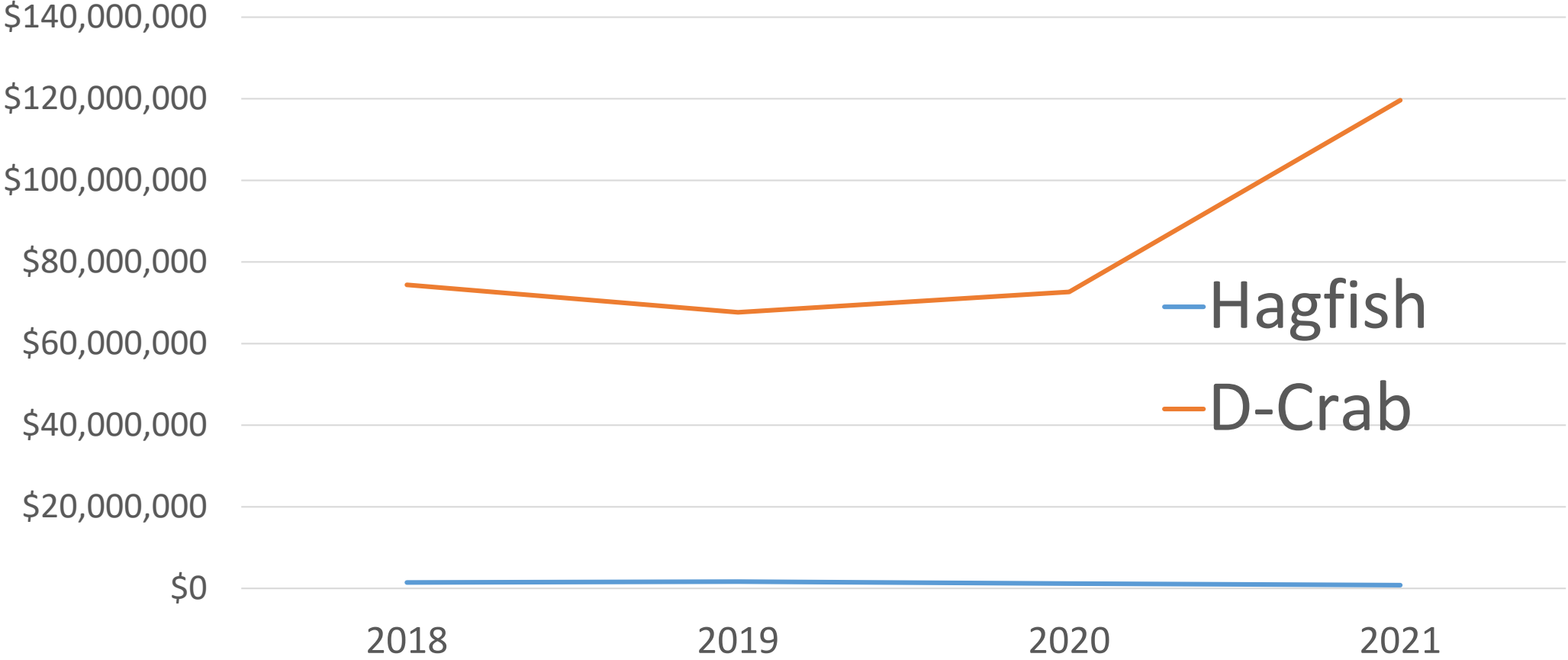


# Constraints

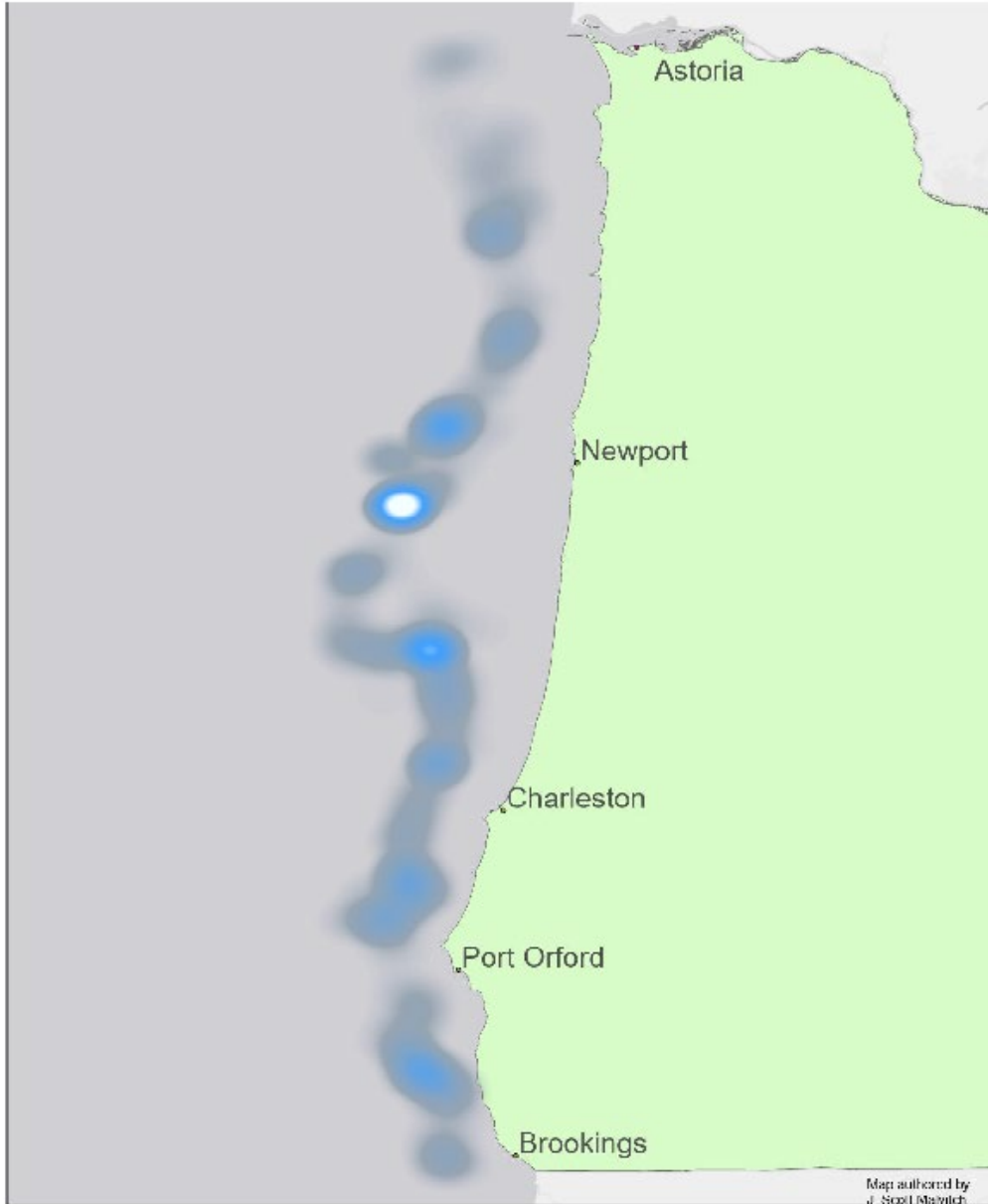


# Fishery Issues

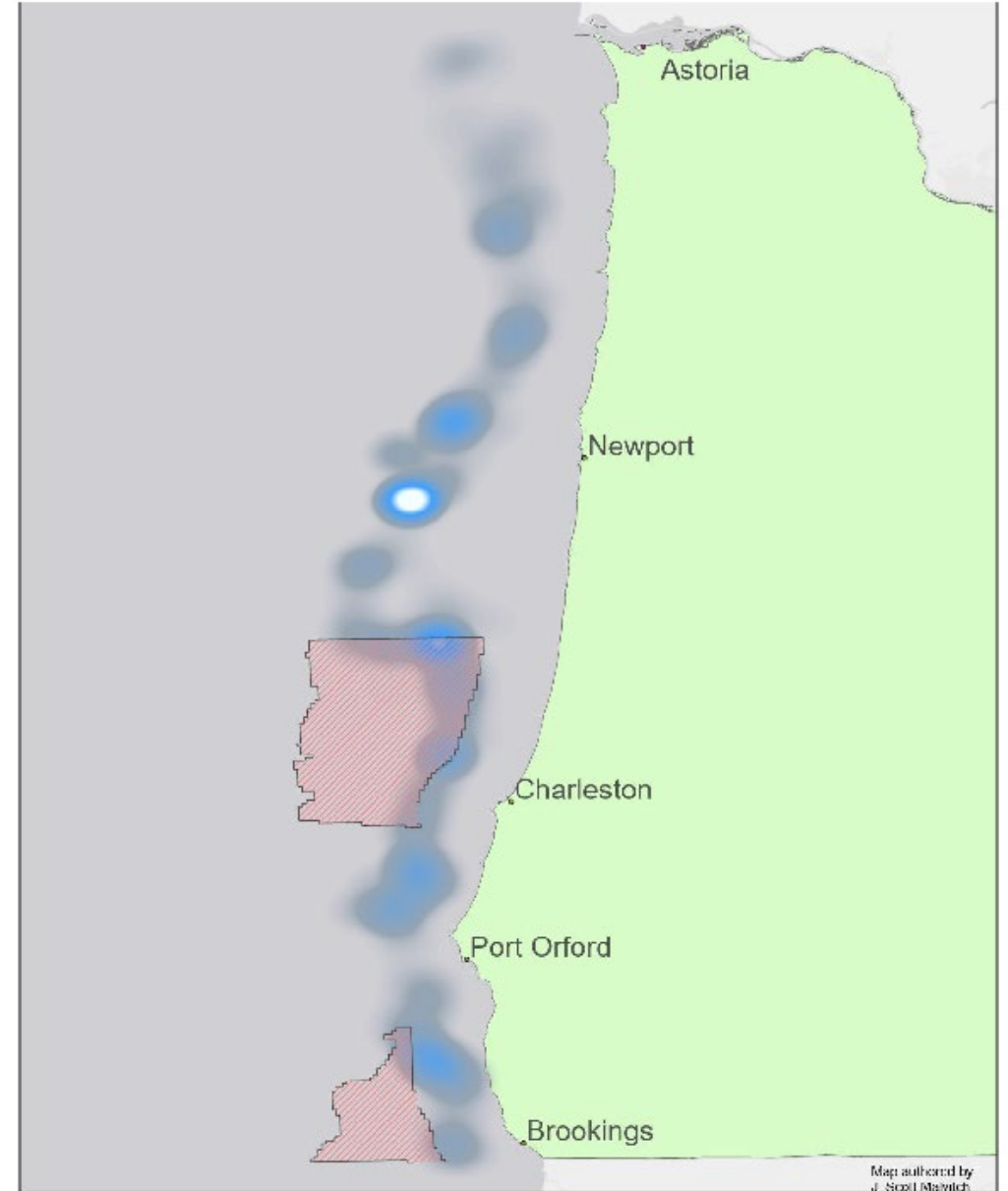
## Annual Landed Value in Oregon



Pacific Hagfish (*Eptatretus stoutii*) fishing effort 2010 - 2022  
landed in Oregon



Pacific Hagfish (*Eptatretus stoutii*) fishing effort 2010 - 2022  
landed in Oregon





## ACKNOWLEDGEMENTS

- ODFW Developmental Fisheries (“DEVO”) Program
- WGC
- The fraction of our fishers who actually share their data



CARD  
6

## Monsters of the Deep

# HAGFISH

## QUESTIONS?

**TOUCHY:** Hagfish have no eyes but use six short tentacles around their mouths to pick up smells from the water. These tentacles can also be used to grab onto prey.

**SLIMED:** Large glands on the hagfish's side produce huge amounts of slime. Its skin becomes covered in the sticky substance, which discourages predators from biting into its body.

### Creature Features

**FAMILY:** Mixinidae

**SIZE:** Length up to 2.3 ft.

**BODY PARTS:** Boneless, worm-like body, small tentacles, 2 rough tongues

**HABITAT:** Depths up to 2,000 feet in the Atlantic, Pacific and Indian Oceans

**PREY:** Worms, fish and crustaceans

Hagfish are jawless, primitive creatures that hunt and scavenge in the world's oceans.

These creatures' boneless bodies are covered in a nasty slime that protects them and also helps these fish slip inside the

bodies of bigger creatures to feed on their insides. Fossil records show that hagfish have squirmed through the seas for more than 300 million years and have changed little over time.

