

The background of the slide is a close-up photograph of two open oysters. They are resting on a white, textured surface that resembles crumpled paper or a paper towel. The oyster shells are dark and rough, while the interiors show the glistening, pale-colored flesh of the oysters. The lighting is bright, highlighting the textures of both the oysters and the surface they are on.

Native oyster restoration in Washington State, USA

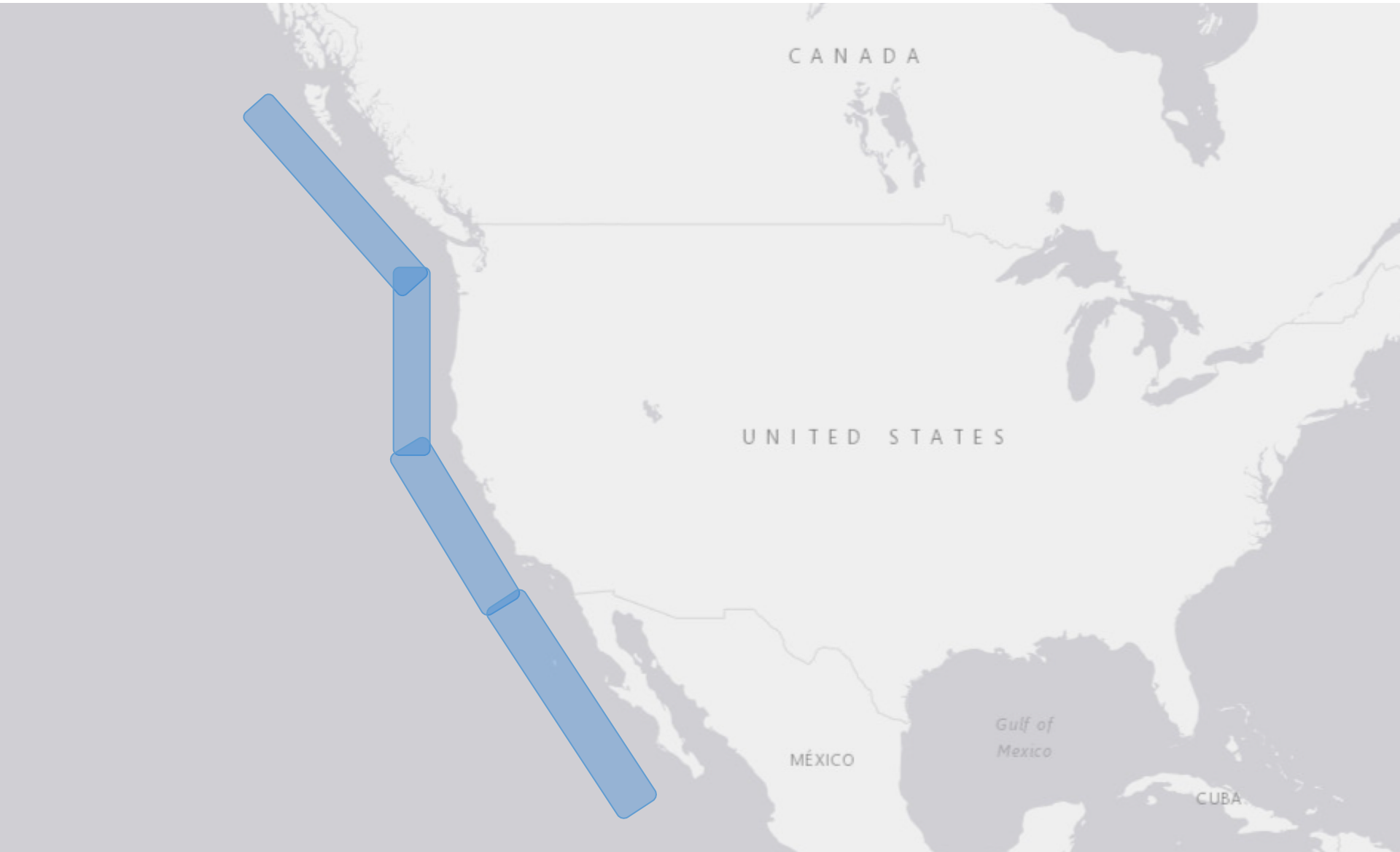
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Olympia oyster
Ostrea lurida

Historic Olympia oyster distribution



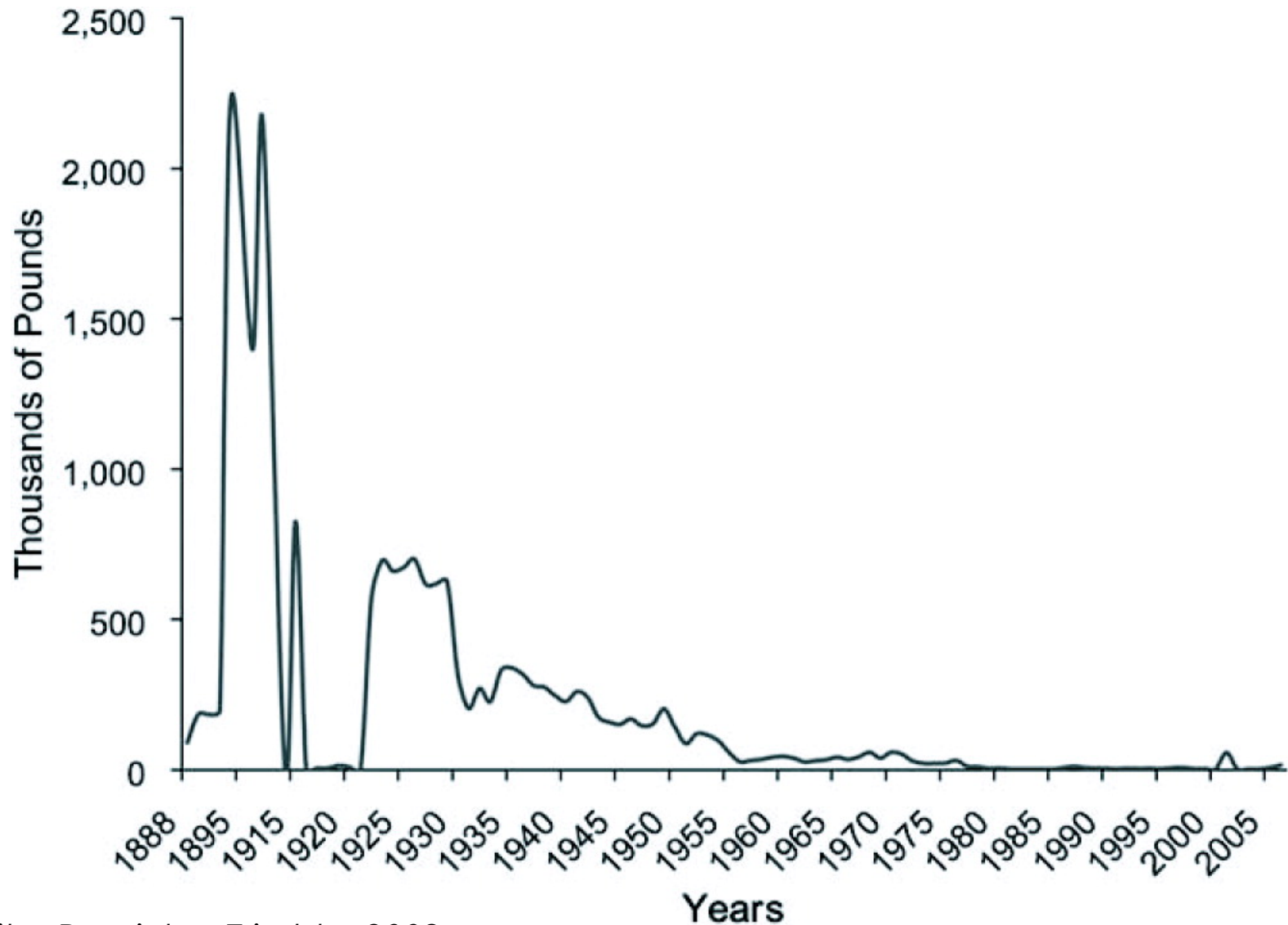
Adapted from McGraw, 2009



September, 1910, Brenner Oyster Company in Totten Inlet

Washington State Historic Society

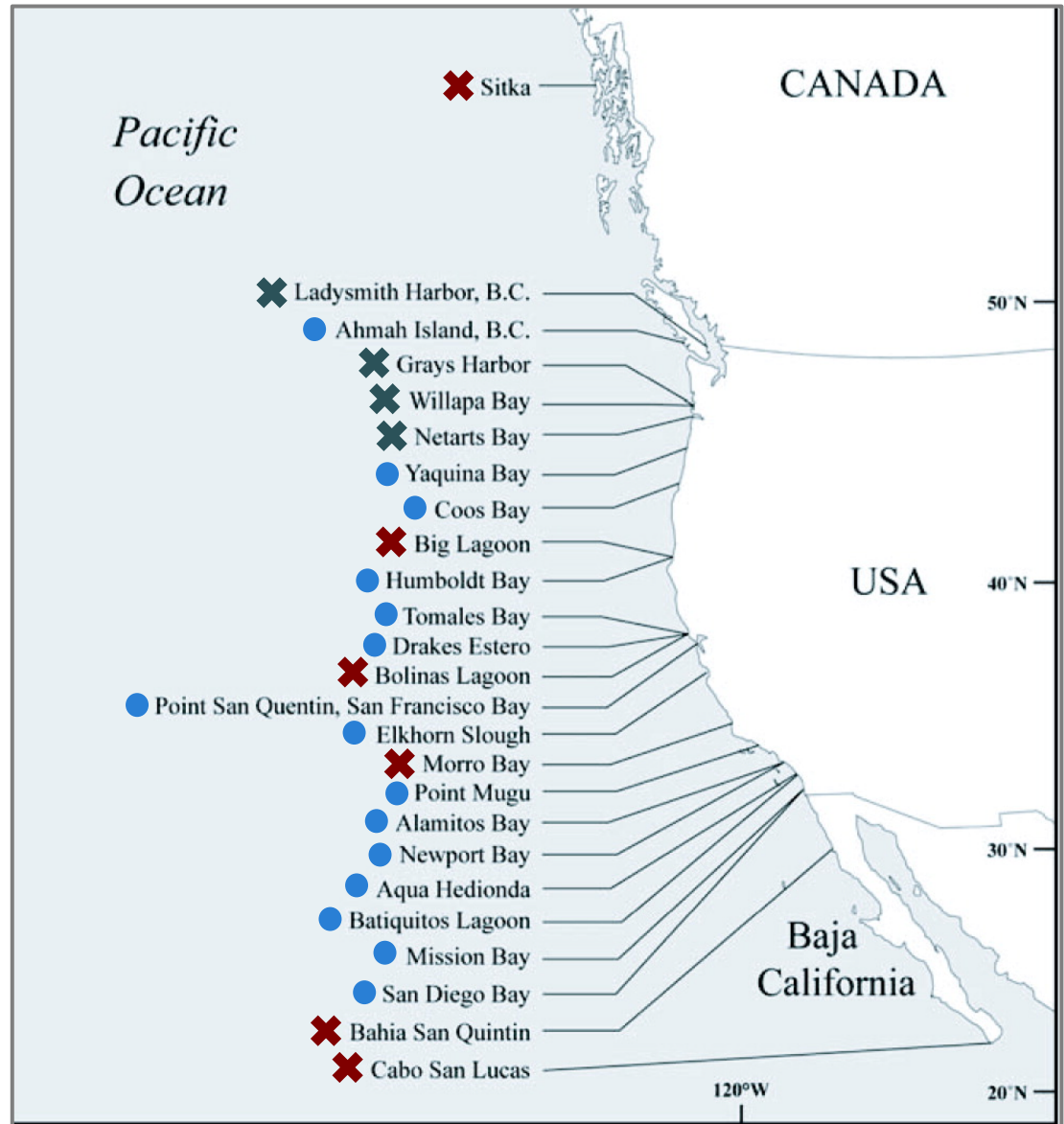
Olympia oyster populations declined rapidly in early 1900's



White, Ruesink & Trimble, 2009

2005/2006 Surveys, *Olympia* oyster distribution

- ✖ All Absent
- ✖ Intertidal Absent
- Present



Adapted from Polson & Zacherl, 2009



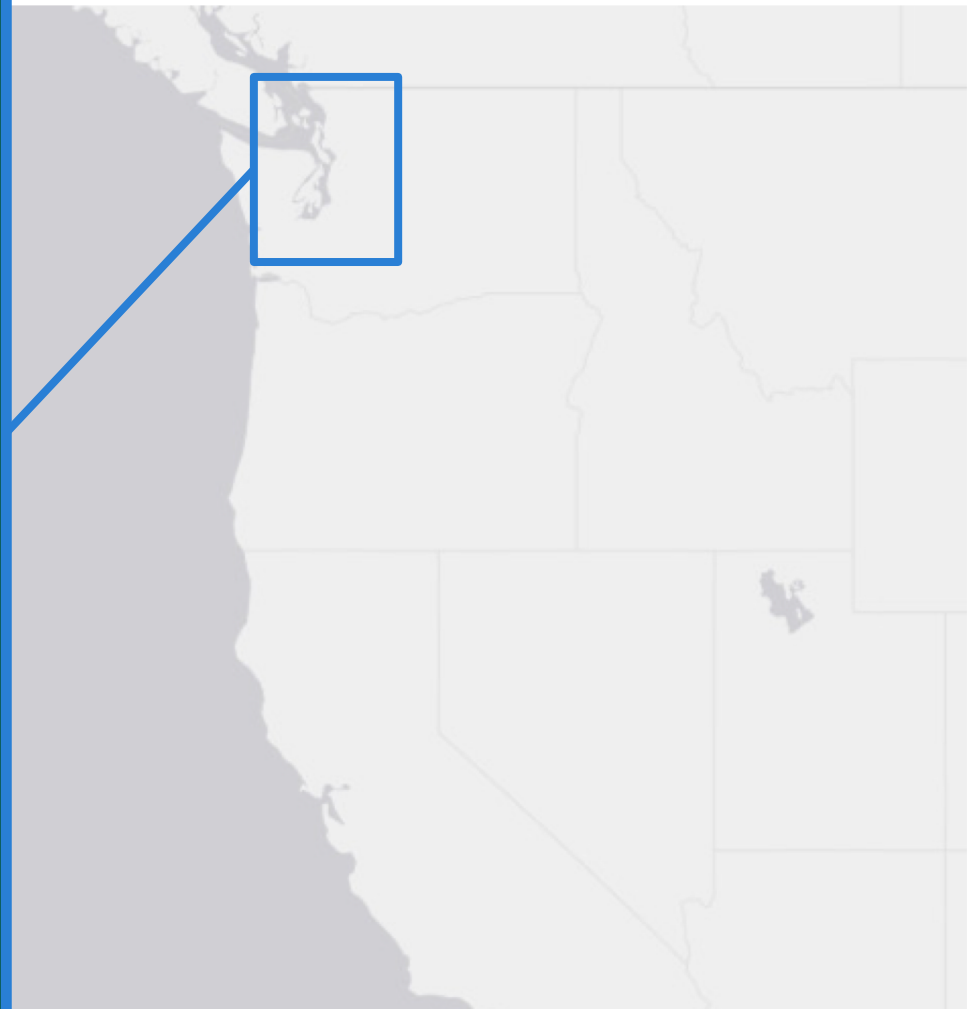
Restoration Strategies

1. Restrict harvest, shoreline development
2. Enhance settlement structure to increase natural recruitment
3. Collect oysters at healthy site, transfer to restoration site
4. Grow seed in hatchery, outplant

WASHINGTON DEPARTMENT OF FISH & WILDLIFE'S
HISTORIC LOCATIONS OF LARGE OLYMPIA OYSTER
BEDS



**Puget Sound has the only Olympia
oyster restoration hatchery**



Hatchery production by Puget Sound Restoration Fund, NOAA

*Kenneth K. Chew Center for
Shellfish Research & Restoration*



A photograph of two oysters resting on a bed of white ice cubes. The oyster on the left is open, showing its pale, glistening interior. The oyster on the right is closed, showing its dark, textured shell. A semi-transparent light blue rectangular box is centered over the oysters, containing text.

GOAL: restore native oyster
population, and **DO NOT HARM**

Concern: genetic diversity

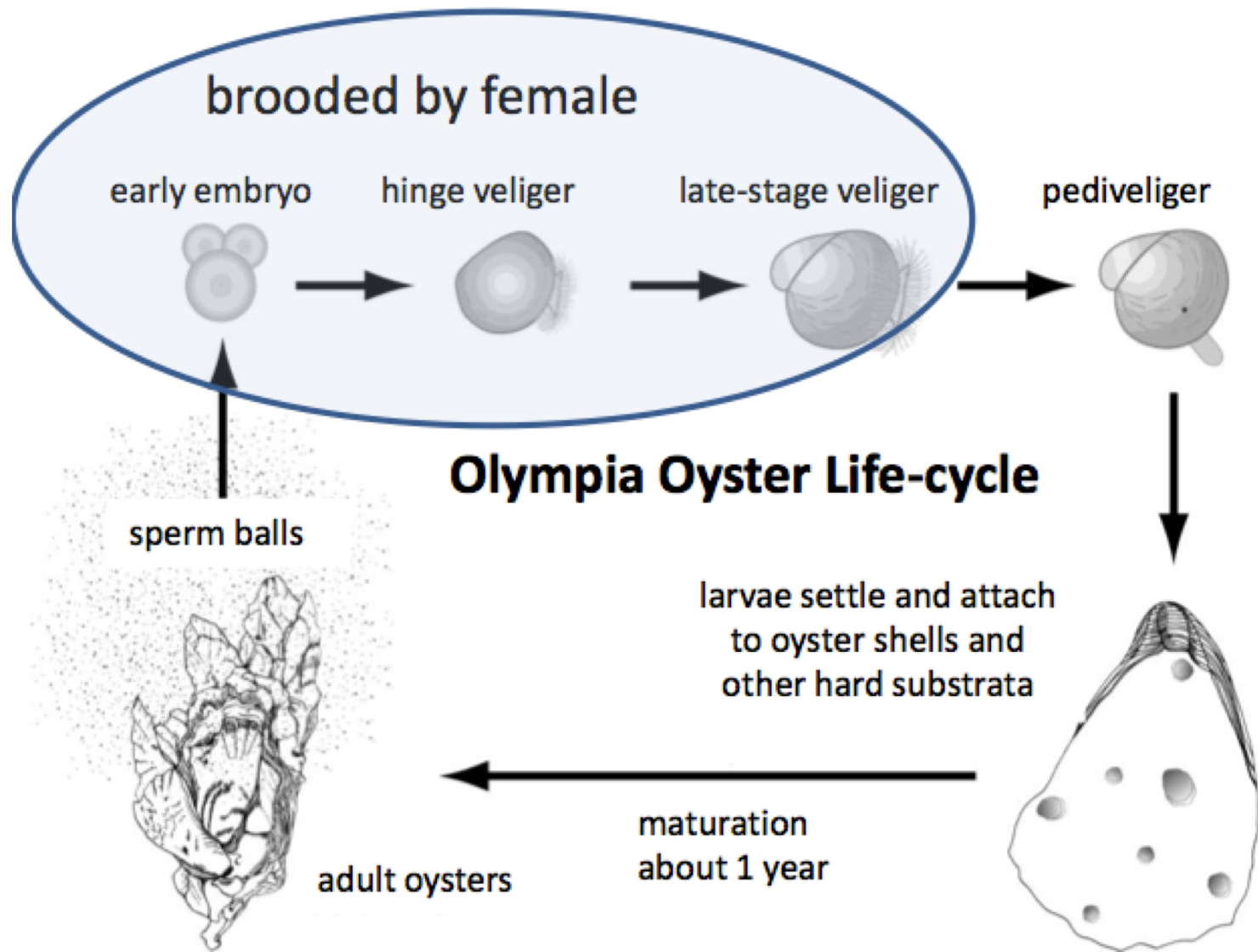


GOAL: *restore native oyster population, and **DO NOT HARM***

Genetic concerns in restoration breeding

1. **Lack of diversity:** producing only a few families
2. **Mixing** genetically **distinct sub-populations** that are locally adapted
3. **Hatchery selection:** traits beneficial in hatchery system amplified, but detrimental in natural system

Larvae brooded to late-stage veliger

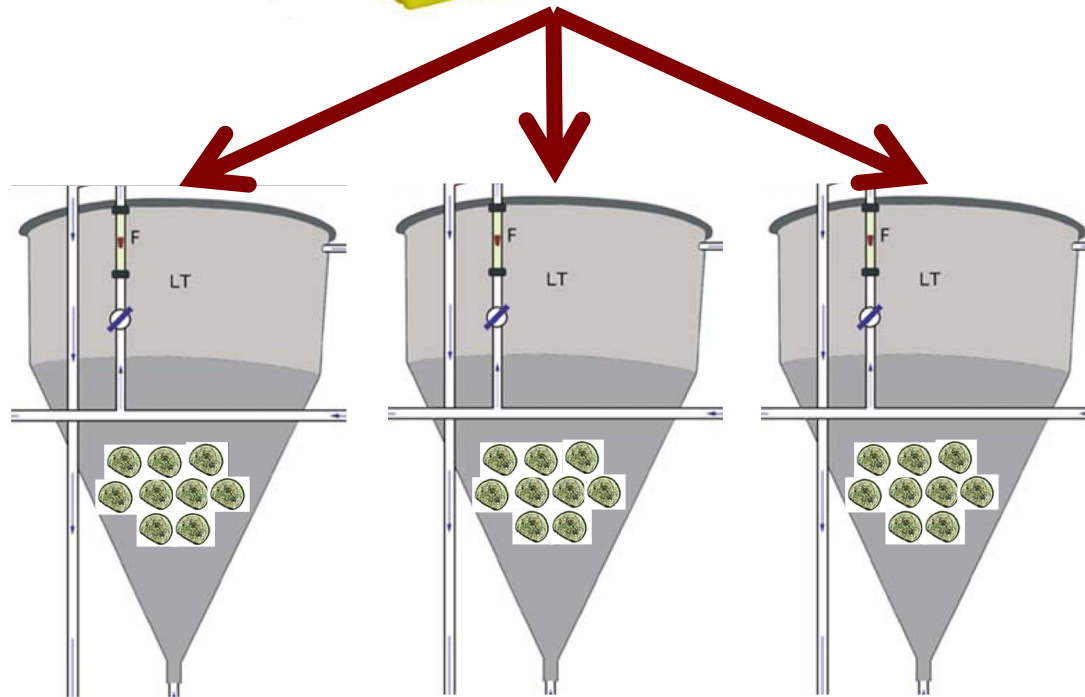
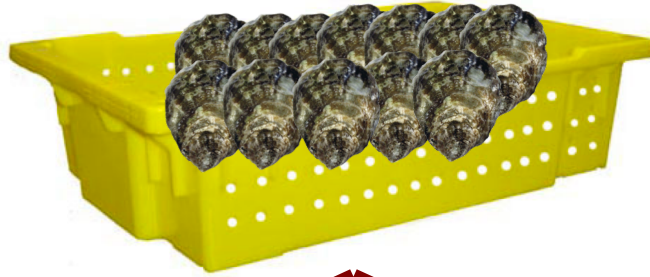


Breeding method 2010 - 2014



Breeding method 2015 - present

**N=1,500
broodstock
minimum**



Mass volitional spawn, no larvae separated

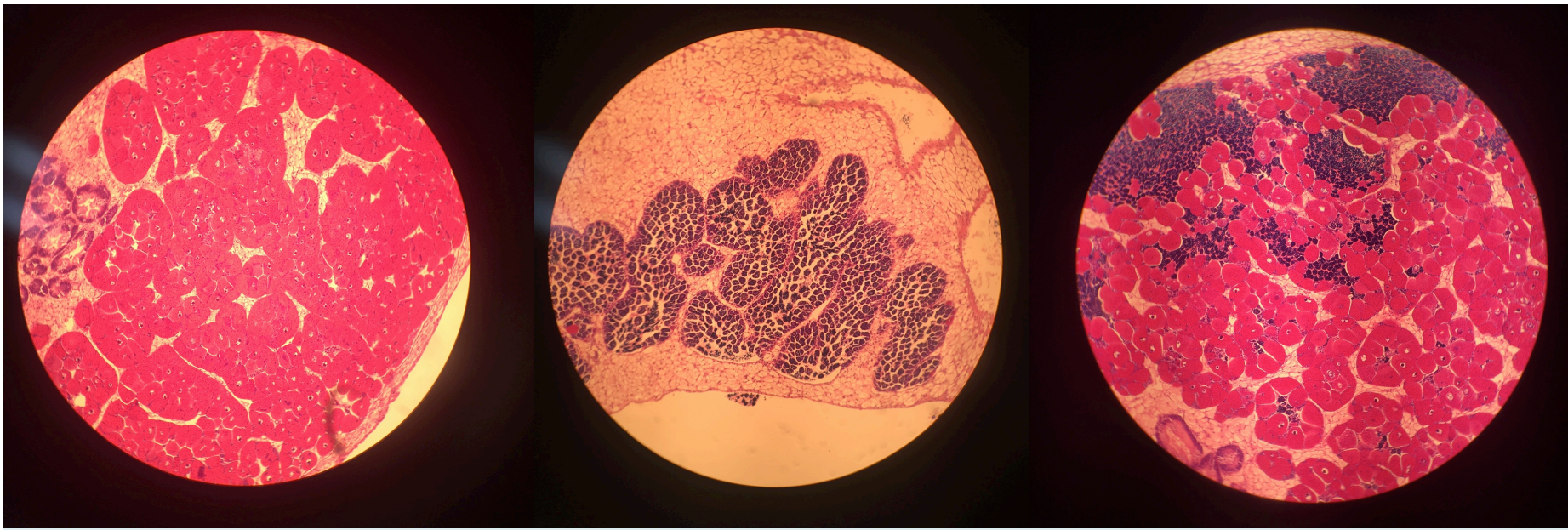


Lessons

- Genetic testing (microsatellites) informed breeding methods
- Better method: Mass volitional spawn
- Added benefit: less labor, resources

Caveats

- No guarantee from year to year
- Not directly assessing hatchery selection
- More robust testing soon! (SNP testing)



My research on Olys

Environmental influences on reproduction, offspring viability

- Broodstock pre-conditioning ~ larvae
- Subpopulation & family differences
- Carry-over effects: offspring phenotype & response to stress











Thank you

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