Informational Briefing: Razor Clam Fisheries and Management

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Marine Resources Program
Razor Clam Fisheries and Management

- Biogeography, Ecology and Life History
- Commercial and Recreational Razor Clam Fisheries
- Annual Stock Assessment for Razor Clam Population along Clatsop Beach
- Estimation of Razor Clam Waste
- Management of 2018-2019 Razor Clam Harvest Seasons
  - Situation analysis and rationale for season delay
  - Public meeting, input, and feedback
  - Current status of razor clam fishery for 2019
Pacific Razor Clam (*Siliqua patula*)

- Geographic range from Aleutian Islands (AK) to Pismo Beach (central CA)
- Genetic evidence for single meta-population
- Depth range: intertidal zone to 55 m subtidal
- Prefer flat, low sloped sandy ocean beaches and inlets
- Uniform sand provides stable habitat
- Require saline marine waters with high oxygen
- Highly mobile vertically (fast diggers!)
- Life-span varies along range (OR = 5 yrs / AK = 13 yrs)
Life History and Growth of Pacific Razor Clams

Life History Traits:
- Broadcast spawning in spring-summer
- Veliger larvae drift for 6-8 weeks
- Typically settle in July-August

Growth and Maturity:
- Rapid growth in summer
- 3.5 inches in YR-1, mature by YR-2
- Growth slows when adults mature
- Historic harvest primarily YR-1 & YR-2

A. D-veliger larva
B. Early post-larva
C. Growth lines on periostracum of adult razor clam
Distribution of Razor Clams along Oregon Coast

- Razor clams occur along entire coast within suitable sandy beach habitat

- Over 90% of population occurs on northern-most 18 miles at Clatsop Beach

- Southern populations are spatially patchy, sporadic and temporally episodic
  - Lack of sediment uniformity
  - Increased recruitment mortality
Long History of Razor Clamming along Oregon Coast

- Razor clams are economically and culturally important to the Pacific Northwest region.

- Consistent abundance on Clatsop Beach:
  - Native American middens
  - Late 1800's settler wagon trails
  - Jetty and infrastructure development accreted sand and increased opportunity

- Popular targets for recreational clammers:
  - Family traditions, multiple generations
  - 35,000 to 50,000 clammers per year
  - Contribute to coastal economies
Commercial and Recreational Razor Clam Fisheries along Clatsop Beach

Commercial Harvest:
• ODFW monitored since 1941

Recreational Harvest:
• ODFW monitored since 1955
## Regulations for Razor Clam Harvests

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Commercial</th>
<th>Recreational</th>
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<tbody>
<tr>
<td>Permit / License</td>
<td>Commercial Fishing License &amp; Commercial Shellfish and Intertidal Animal Harvest Permit / Open Access (ca. 130 per year)</td>
<td>Recreational Shellfish License</td>
</tr>
<tr>
<td>Open Area / Season</td>
<td>Year-round along Oregon beaches</td>
<td>Year-round along Oregon beaches</td>
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<tr>
<td>Closed Area / Season</td>
<td><strong>Summer Conservation Closure along Clatsop Beach / Jul 15 to Sep 30</strong></td>
<td></td>
</tr>
<tr>
<td>Tools / Equipment</td>
<td>Hand or shovel</td>
<td>Hand, shovel, tube (4 in dia)</td>
</tr>
<tr>
<td>Shell Size</td>
<td>Minimum shell size 3.75 in</td>
<td>No minimum shell size</td>
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<tr>
<td>Catch Limits</td>
<td>No annual limit or harvest quota</td>
<td>Daily limit first 15 clams</td>
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Harvest Cyclical Over Time
- Driven by clam abundance
- Strength of larval settlement events

El Nino / Relationship
- Increase harvest
  - Multiple year lag
- Decrease harvest
  - Shorter lag

Marine Biotoxin Closures
- More frequent recently
- Concurrent with high clam abundance
Razor Clam Harvest: Change over Time

- Commercial until 1950s
- Rapid switch to Recreational 1953-1958
- Increase in OR visitors
  - tourist destination
  - economic value

Consistent Pattern

- High abundance increases commercial landings

Commercial Harvest is Predominately for Human Food

Average Razor Clam Harvest (1958-2018):
- 85% Recreational
- 15% Commercial
  - >75% Human Consumption
Razor Clam Stock Assessment:

Standard process to assess spatial distribution, abundance and size for razor clam populations

Initiated in OR in 2004
- Clatsop Beach only
- 10-12 transects annually
- Informational
  - Recruitment events
  - Size frequency distribution
  - Cohort survival
Razor Clam Abundance along Clatsop Beach:

Razor clam abundance is cyclical and dependent upon strength of juvenile cohort.

Historic clam abundance:
- Ranges from 0.17 to 2.5 clams/m²

High abundance in 2014-15

Record effort & harvest in 2016
Highest clam densities typically at north and south ends of Clatsop Beach

Moderate clam densities occur throughout Clatsop Beach

Low clam densities at a few sites

Average razor clam shell size is fairly consistent throughout Clatsop Beach
Waste of Razor Clams:

Intentional Discard of Unwanted Razor Clams in Violation of Regulations

- Retain 1st 15 Clams Regardless of Size or Condition

Index of Razor Clam Waste:

Wastage surveys conducted in spring and summer

- Very low tides in early mornings
- Harvester effort substantially increased
- Juvenile clams become readily available
Waste of Razor Clams:

Survey Methods to Determine Index of Razor Clam Waste:

1. Identify harvest area for survey
   - significant harvester holes
2. Assess harvester hole for gear type
   - shovel or clam tube
3. Re-dig harvester hole
   - explore full extent of hole
4. If clam found, note size and condition
5. Wastage rate determined for site
6. Waste Index = # Clams found ÷ # holes re-dug
- 69% of clams in waste index are small <95 mm
- Gear type is consistent with creel survey data
- Minor shell/siphon damage and incorrect placement result in 80% mortality
- Major shell/siphon damage is immediately fatal
Waste of Razor Clams:

- High mortality of discarded clams
- Annual variation in index of clam waste
  - Increases
    - Strong recruitment cohort
    - Uniform spawning of mature clams
  - Decreases
    - Weak recruitment cohort
    - Sporadic spawning of mature clams
- Seasonal increase in waste
  - Juvenile clams hyper-feed = show more
  - Mature clams spawn = don’t show

Average Waste = 14.8%
Management of 2018-2019 Razor Clam Harvest Seasons

Annual Stock Assessment Survey for Clatsop Beach 2018 showed:

- Average abundance of razor clams (0.1 to 2.4 clams/m²)
- Unequal spatial distribution along Clatsop Beach
Management of 2018-2019 Razor Clam Harvest Seasons

Population consists of small razor clams with average shell length of 68 mm

Below min size for commercial harvest (95 mm)

Not desired by recreational clammers

Oregon Clatsop Beach Razor Clam
Assessment Size Frequency Distribution - 2018

- n=204
- Ave. Size (mm)= 67.6
- Ave. Size (in.) = 2.66

- 2007-2018
  - Ave. Rec. Harvest Size (mm)= 109.8
  - Ave. Rec. Harvest Size (in)= 4.32

- 2018
  - Ave. Size (mm)= 115.0
  - Ave. Size (in)= 4.5
Management of 2018-2019 Razor Clam Harvest Seasons

Monitoring of Razor Clam Gonads and Reproductive Condition showed:

- Successful spawning event in 2017
- Spawning occurred unusually late in season (Jun-Aug)
Management of 2018-2019 Razor Clam Harvest Seasons

Monitoring of Razor Clam Gonads and Reproductive Condition for 2017:

- Gonad development in maturing clams in Feb - Apr
- Peak % mature clams in May
- Successful spawning event in Jun - Aug
Management of 2018-2019 Razor Clam Harvest Seasons

Annual Variability in Shell Size Frequency Distributions for Razor Clams along Clatsop Beach:

- 2015 and 2016 populations were robust with similar size distribution
- 2017 showed a lack of recruitment and a population skewed heavily to larger clams
- 2018 is highly skewed to smaller clams with very few moderate or large clams
- Red line shows minimum size for commercial harvest (95 mm)

Size distribution of razor clams from stock assessment surveys

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
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<tbody>
<tr>
<td>2015</td>
<td>460</td>
</tr>
<tr>
<td>2016</td>
<td>375</td>
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<tr>
<td>2017</td>
<td>106</td>
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<tr>
<td>2018</td>
<td>204</td>
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Management of 2018-2019 Razor Clam Harvest Seasons

Summary of Management Actions:

• Stock Assessment identified unusual size distribution
  ✓ Population dominated by 2-3 inch clams

• Analyzed data and modeled potential harvest
  ✓ Estimated harvest was low vs. spring – but not insignificant
  ✓ Potential for waste of small clams was very high

• Enacted temporary rule to delay opening until at least Nov 1st, 2018
Summary of Management Actions:

- ODFW hosted public meeting to gain input and feedback from stakeholders on management options
  - Seaside / Oct 22, 2018
  - Presented background information, situational analysis, and management options

- Solicited feedback on delay of harvest season
  - 86% favored delay until at least Mar 1, 2019
  - 7% favored delay until Jan 1, 2019
  - <5% favored open harvest ASAP

- Other feedback included:
  - Closing harvest season in Jun of each year (reduce wastage)
  - Adaptive management approach
Management of 2018-2019 Razor Clam Harvest Seasons

Summary of Management Actions:

- ODFW enacted temporary rule to delay season until Mar 1, 2019
  - Strong public support for delay
- ODFW shellfish staff are monitoring growth during closure
  - Monthly monitoring at standardized Site
  - Collect at least 50 clams/mo
- Current data indicates growth is very slow
  - Consistent with literature
  - Growth rate < 1 mm per week
  - Unlikely that most clams > 95 mm (3.5 in) by Mar 1, 2019

- Size distribution of razor clams
  - Sep 2018
  - Nov 2018
  - Dec 2018
  - Jan 2019
  - Jan 2019

- Management of 2018-2019 Razor Clam Harvest Seasons
Current Status for 2019 Razor Clam Harvest Season

- Clams grew slowly and remained small through winter months of 2019

- Next survey to measure shell size is scheduled for PM low tide on Feb 18, 2019

- Some small clams may still be below the minimum shell size for commercial harvest (95 mm or 3.5 in) by scheduled opening on Mar 1, 2019

- Improved outreach activities may help recreational clammers reduce wastage and be more successful
Comments / Questions