The Biology and Stock Assessment of Rockfishes in Puget Sound

Wayne Palsson
Tien-Shui Tsou
Greg Bargmann
Raymond Buckley
Jim West
Mary Lou Mills
Yuk Wing Cheng
Robert Pacunski
www.wdfw.wa.gov

-Management
-Biology
-Habitat
-Fisheries
-Stock Evaluation
-Stressors
-Research Needs
Diversity!
Rockfish are Evolved for Long Life

- Live over 100 years
- Maturity 5 to 20 yrs
- Successful spawning once per decade
- Slow growth
- Habitat specific
Rockfish Fisheries in Puget Sound

- Commercial
  - Historic troll and jig fisheries.
  - Targeted eliminated by 1994
  - Bycatch: Trawling, longlines, set nets (bycatch)

- Recreational
  - Now bycatch only.
  - Private and charter boats
  - Scuba spearfishing
  - Shore & dock fishing

- Tribal
Historical Catch Records

Harvest (pounds x 1000)

Year

1920 1940 1960 1980 2000
Rockfish Harvest in Puget Sound

Puget Sound

Incomplete Sport Catch

pounds (x1000)


Commercial  Sport
Stock Evaluation

• Data Limited

• Three approaches:
  – Fraction of Lifetime Egg Production
  – Coastal Age-structured Assessment
  – AFS Marine Fish Stocks at Risk (Musik 1999)

• Stock Status
Stock Status Criteria

• **Healthy**: Stable, Increasing Trends

• **Precautionary**: Declining Trends less than vulnerable threshold

• **Vulnerable**: At or near vulnerable threshold, mitigating conditions

• **Depleted**: Much below vulnerable threshold

• **Unknown** = **Precautionary**
Recreational Fishing Success

mirrors population trend assuming constant chance of catching a fish
Decline in Copper Rockfish Size

% > 40 cm (12"")

Year

North
South
Change in Copper Rockfish Spawning Success

Spawning Potential (SSBR) (mill eggs/female)

Year


North
South
Central Sound Scuba Study

**Copper Rockfish**

- Y-axis: Number of Fish/Transect

**Quillback Rockfish**

- Y-axis: Number of Fish/Transect
## Trend Summary for Common Rockfishes

<table>
<thead>
<tr>
<th></th>
<th>Copper</th>
<th>Quillback</th>
<th>Brown</th>
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<tbody>
<tr>
<td><strong>North</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spawning Potential</td>
<td>69% Decline</td>
<td>73% Decline</td>
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<tr>
<td>Video</td>
<td>&gt;50% Decline</td>
<td>No Trend</td>
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<tr>
<td><strong>South</strong></td>
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<tr>
<td>Spawning Potential</td>
<td>80% Decline</td>
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<tr>
<td>Video</td>
<td>&gt;50%-80% Decline</td>
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<tr>
<td>Trawl</td>
<td>Decline</td>
<td>Decline</td>
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<tr>
<td>Dive</td>
<td>70% Decline</td>
<td>90% Decline</td>
<td>Increasing</td>
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<tr>
<td>Species</td>
<td>North Sound</td>
<td>South Sound</td>
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<tr>
<td>Copper rockfish</td>
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<tr>
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<td>Brown rockfish</td>
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<tr>
<td>Yelloweye rockfish</td>
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<tr>
<td>Canary rockfish</td>
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<tr>
<td>Bocaccio</td>
<td>Precautionary</td>
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<td>Redstripe rockfish</td>
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<td>Greenstriped rockfish</td>
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<tr>
<td>Puget Sound rockfish</td>
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<td>Healthy</td>
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</tbody>
</table>
Rockfish Stock Status

- Healthy
- Precautionary
- Vulnerable
- Depleted
Federal ESA Listing

- Bocaccio
- Canary Rockfish
- Yelloweye Rockfish
Rockfish Management in Puget Sound

- No retention of rockfish by non-tribal fisheries
- No retention east of Port Angeles
- 120 ft depth restriction for bottomfishing
- Closed most commercial fisheries for bottomfish
- No Spearfishing
- Closed for yelloweye and canary
- Marine reserves created
- Fishery-independent surveys
  - Video, scuba, trawl