Jackpot Recruitment and Conservative Management Effects on Rockfish Abundance Inside and Outside Marine Reserves in Puget Sound

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Visual Census Technique

Width determined by
Census
Strip
Line transect
Length by design
Random vs. Fixed
WDFW’s Reserve System

Non-tribal

Enacted as:

- Conservation Areas (no-take)
- Marine Preserves (partial take)
- All protect bottomfish and most shellfish
Reserve Study in Main and Southern Basin

Reserves
- Edmonds (Brackett’s Landing) - 1970
- Orchard Rocks - 1998
- Colvos Marine Preserve - 2000
- Z’s Reef - 2002

Fished
Port Blakely, Blake Island, Orchard Rocks (<1998), Point Glover
Dive Transects 6 times per year (spring/fall)
YOY Index Sites

- 19 sites
- Varied Vegetation
- 7 in or near MRs
- Most <10 m depth
- Most 300 m²
2006 YOY Density

North

Site

South

fish/100 m²

0.0  100.0  200.0  300.0  400.0  500.0
2006 YOY
Vegetation Association

![Bar graph showing fish density in different vegetation types in 2006](chart.png)

- **Primary Vegetation**
  - C/US Kelp: 35 fish/100 m²
  - Eelgrass: 0 fish/100 m²
  - Eg/US Kelp: 1 fish/100 m²
  - US Kelp: 0 fish/100 m²
  - US/Foliose Reds: 2 fish/100 m²
YOY Annual Index
18-19 Sites/yr
South Sound Length Progression

**Nearshore**

2006

**Offshore**

2006

2007
## Average Fish > 10 cm/100 m²

<table>
<thead>
<tr>
<th>Site</th>
<th>1995-97</th>
<th>2000-06</th>
<th>2007-10</th>
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</thead>
<tbody>
<tr>
<td>Port Blakely</td>
<td>4.1</td>
<td>2.5</td>
<td>2</td>
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<tr>
<td>Blake Is.</td>
<td>2</td>
<td>2.5</td>
<td>17.8</td>
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<tr>
<td>Point Glover</td>
<td>0.4</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Orchard Rocks</td>
<td>0.6</td>
<td>0.8</td>
<td>2.8</td>
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<tr>
<td>Edmonds</td>
<td>31.9</td>
<td>10.7</td>
<td>19.4</td>
</tr>
<tr>
<td>Z's</td>
<td>3.3</td>
<td></td>
<td>14.8</td>
</tr>
<tr>
<td>Colvos</td>
<td>2.3</td>
<td></td>
<td>5.7</td>
</tr>
</tbody>
</table>

Red = Marine Reserves
Adult and Sub-adult Copper Rockfish

**Main Basin Sites**
- Pt. Blakely
- Blake Is.
- Orchard
- Edmonds
- Pt. Glover

**Southern Basin Sites**
- Z's
- Colvos

The graphs show the fish density (fish/100 m²) over time from 1995 to 2010 for both Main and Southern Basin sites.
## Recruitment Response

<table>
<thead>
<tr>
<th>Site</th>
<th>Reserve?</th>
<th>YOY?</th>
<th>&gt;2006 Response?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Blakely</td>
<td>No</td>
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<tr>
<td>Blake Is.</td>
<td>No</td>
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<td>Yes</td>
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<tr>
<td>Pt. Glover</td>
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<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Orchard</td>
<td>Yes</td>
<td>No</td>
<td>Minor</td>
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<tr>
<td>Edmonds</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Colvos</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</table>

Red = Marine Reserves
Results

- Early reserve effect
- Varied pattern during early 2000s
- 2006 was a phenomenal recruitment
- Most copper rockfish grown to 30 cm in 4 years
- Has had a strong impact on some reserves and fished sites and is persistent with conservative management
Dive Index Update

![Graph showing fish/transect data over years from 1985 to 2005. The graph compares two species: BROWN and COPPER. The data shows an increase in fish/transect over the years.]