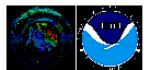
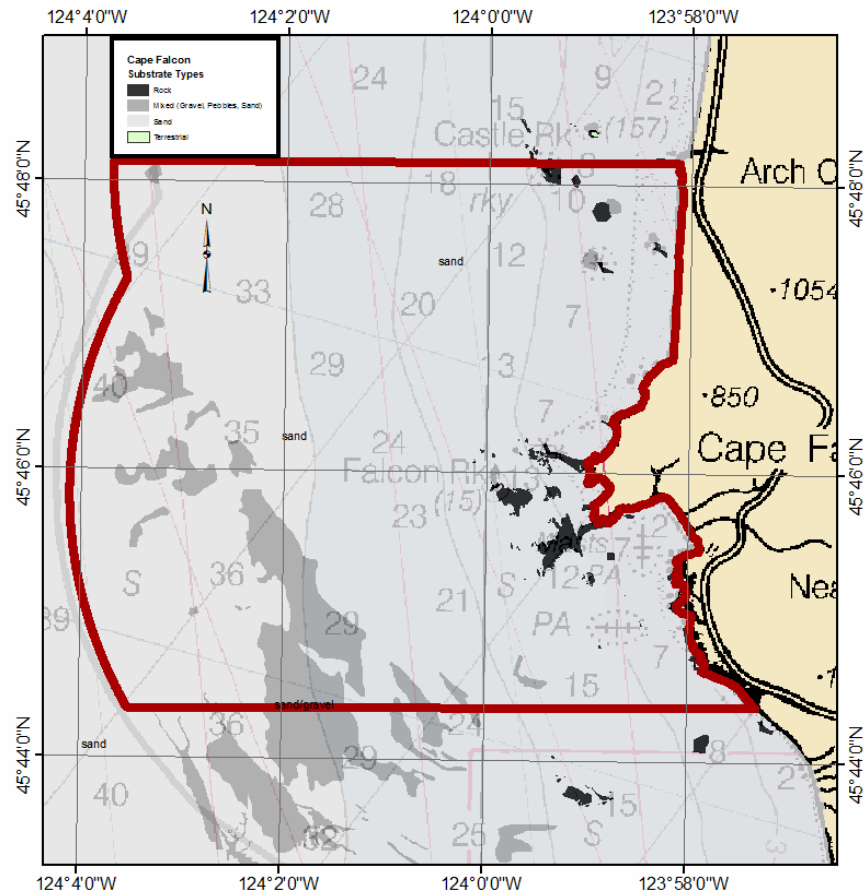


**Section 1:**  
Cape Falcon Analysis of ODFW Recommendation  
December 17, 2010

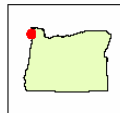
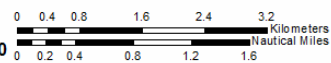
## Marine Reserve Site as Modified By OPAC

Area: 51.6 km<sup>2</sup>  
 Alongshore length: 7.0 km  
 Offshore length: 7.0 km

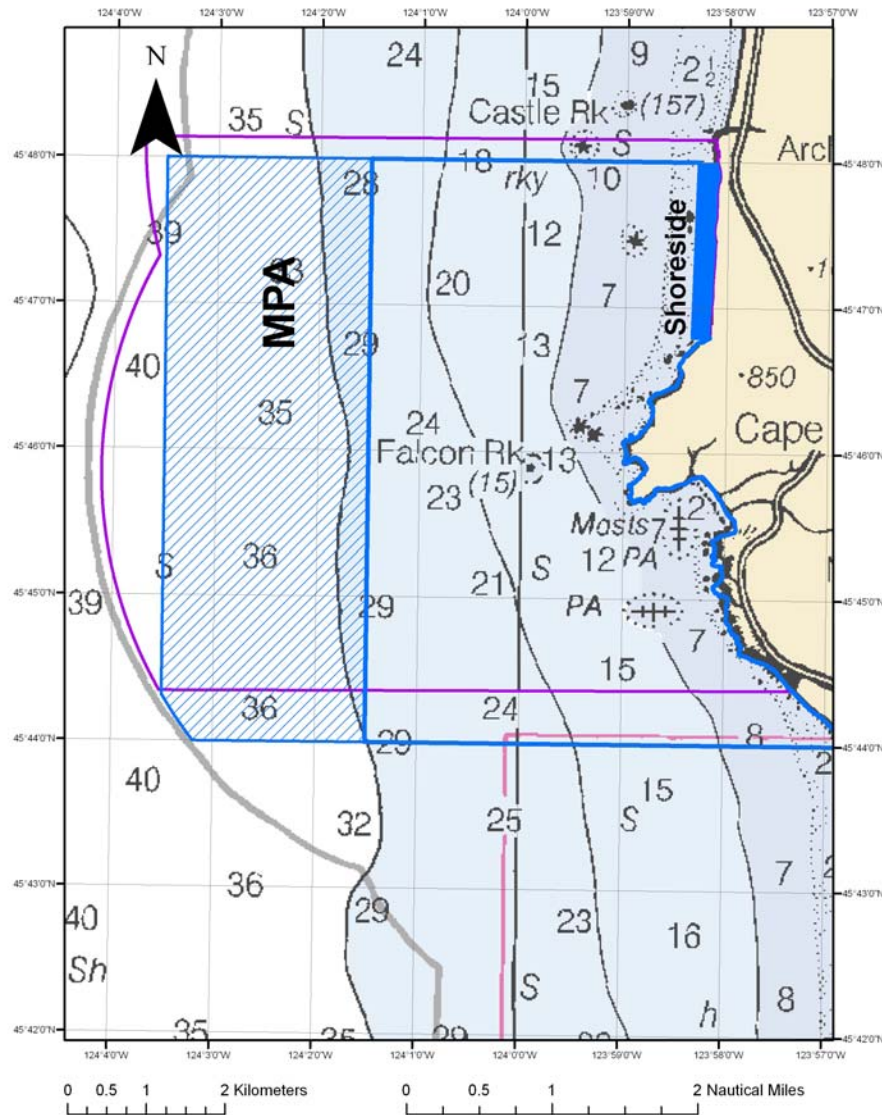


Scale: 1:53,000

USGS 1984, Zone 10



## Cape Falcon Final Recommendation



### **Marine Reserve:**

**Area:** 32.8 km<sup>2</sup>

**Alongshore length:** 7.4 km

**Offshore length:** 5.2 km

### **Shoreside MPA:**

**Alongshore length:** 2.2 km

**Allowances:** Shoreside fishing for fish species and crab; assumes no harvest from water craft or diving. All other extractive activities (including rocky intertidal harvest/collection of invertebrates, algae, and natural products) prohibited.

### **MPA:**

**Area:** 22.4 km<sup>2</sup>

**Alongshore length:** 7.4 km

**Offshore length:** 2.6 km

**Allowances:** Commercial and sport crab & salmon. Exception: no commercial crab pots can be set in delineated gravel substrate. All other extractive activities (including new ocean development) prohibited.

**OPAC Attributes:**

**Seafloor area:**

Subtidal (km<sup>2</sup>):

Depth	Rock	Mixed	Sand	Total
0-25 m	0.6	0.1	12.0	12.7
25-55 m	0.1	0.6	18.0	18.7
> 55 m		3.1	17.2	20.2
<b>Total:</b>	<b>0.7</b>	<b>3.7</b>	<b>47.1</b>	<b>51.6</b>

Subtidal (% of site):

Depth	Rock	Mixed	Sand	Total
0-25 m	1.1%	0.1%	23.3%	24.6%
25-55 m	0.3%	1.2%	34.8%	36.2%
> 55 m		5.9%	33.3%	39.2%
<b>Total:</b>	<b>1.4%</b>	<b>7.2%</b>	<b>91.4%</b>	<b>100%</b>

Intertidal: rocky 11.7 km, total 20.3 km

**Consumptive users shown or assumed to use the area:**

<b>Commercial:</b> <ul style="list-style-type: none"> <li>• crab</li> <li>• flatfish trawl</li> <li>• salmon<sup>2</sup></li> <li>• fixed gear<sup>1</sup></li> <li>• lingcod<sup>1</sup></li> <li>• nearshore limited entry<sup>1</sup></li> </ul>	<b>Recreational<sup>2</sup>:</b> <ul style="list-style-type: none"> <li>• crab</li> <li>• groundfish</li> <li>• salmon</li> </ul>
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1. Logbook analysis shows limited to extremely low use of this scenario area.

2. No spatial catch data available.

3. Experiential and questionnaire data.

## Cape Falcon ODFW Final Recommendation Attributes:

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## **Cape Falcon Analysis Narrative**

### **Decision Point 1: Are there issues with the OPAC recommended boundaries relative to the sideboards?**

#### **Socio-economic Sideboard:**

The OPAC site presents some socio-economic concerns for consumptive stakeholders. The relevant effects to the commercial, recreational, charter, and shoreside fisheries as well as the identified communities of place would be:

- A loss of 0.79% of the total fleet wide catch for commercial crab which equates to approximately 66,826 Lbs. This would be considered a moderate loss to the fishermen that use this area if this area consistently and annually provided this opportunity.
- A loss of some commercial salmon fishing areas.
- A loss of some recreational fishing areas for nearby communities and those coming out of nearby ports for crab, salmon, and groundfish. This includes both private motorized vessels and self propelled craft such as kayaks.
- A loss of some opportunity near the northern boundary of the site to the Garibaldi charter fleet. There is an increased chance for displacement and negative impact during RCA closures to 20 fm for this fleet and those out of nearby communities like Nehalem.
- A loss of some opportunity to the Nehalem charter fishing fleet and recreational fishermen that use the site for subsistence.
- A loss of traditional shoreside fishing opportunity to the Falcon cove and Cove Beach communities at Short Sands beach and north of the headland at Oswald West. This also may cause a socio-cultural impact to certain families from the loss of traditional activities and opportunity for subsistence fishing.

#### **Ecological Sideboard:**

The OPAC site is consistent with marine reserve size and configuration guidelines presented in the STAC Size and Spacing Report.

- Overall size of the site: The site's alongshore length of 7.8 km is within the 5-10 km minimum alongshore length guideline. The site extends from the rocky intertidal to the outer edge of the territorial sea, covering the entire depth range within the Cape Falcon Area, and meeting the east-west extend guideline.
- Seafloor types and depth ranges: The site has a variety of seafloor types, including rocky intertidal, and subtidal sand, rock, and other unconsolidated mixed bottom habitats, primarily gravel. All depth ranges present in the area are represented. The site has a relatively large component of deeper water (over 55 m) because the territorial sea extends farther out (7 km or 3.8 nautical miles) at Cape Falcon than adjacent parts of the coast.
- Representation of seafloor types and depth ranges: With the exception of deep offshore (>55m) rocky habitat, the site contains all seafloor types and depth ranges found in that segment of the coast. The overall distribution of habitats among seafloor types and depths is generally representative of the area within 10 km north and south of the site
- Species representation: Given the variety of seafloor types and depth ranges, species affiliated with shallow rocky habitat as well as shallow water and mid-deep water species affiliated with mixed and sand habitats should be well represented. The overall size in both the alongshore, east-west extent and depth allows for the protection of attached algae, sessile and habitat forming invertebrates and mobile benthic invertebrates. This configuration also provides an ecological corridor for some fish species to move to offshore waters and habitats and a footprint for fish species with limited home ranges.
- Special features and other considerations: The site contains 48 emergent rocks, which are sites of high biodiversity, 14 seabird nesting colonies, and 2 pinniped haulouts. Cape Falcon is the only marine reserve evaluation site in the northern third of Oregon's coast, giving the best representation of the highly productive oceanographic area influenced by the Columbia River.

### Decision Point 1 Finding

The OPAC site meets the ecological sideboard; however, concerns about socio-economic impacts justify the need to explore site modifications designed to reduce negative socio-economic effects while maintaining the site's ecological significance.

### **Decision Point 2: If so, what modifications do you recommend to fix the issue?**

The recommendation made by the Cape Falcon community team was that of the original OPAC proposal with a very narrow vote of 9 to 7. As stated above, the OPAC site needed modifications to meet the socio-economic sideboard. Given the lack of stronger agreement among the team, the ODFW recommendation described below reduces potentially adverse socio-economic effects described above for the OPAC site, while maintaining enough of the site's ecological significance for it to be meaningful. This section describes the ODFW modifications made to the site, and the effect of those modifications on socio-economic and ecological sideboards.

**ODFW Recommendation:** The recommendation provides for a marine reserve, reduced in size (32.8 km<sup>2</sup> compared to 51.6 km<sup>2</sup>) and shifted slightly south from the OPAC site, along with two MPAs. The shoreside MPA on the northern shore of the site would prohibit all extractive uses except recreational fishing from shore. The west MPA would prohibit extractive uses except commercial and sport fishing for crab and salmon, with an exception of no setting of commercial crab pots in delineated gravel substrate. ODFW will delineate the gravel areas during the baseline study period working with local crab fishermen and the scientific community to ground-truth seafloor habitat maps. Delineation will be made using straight-line polygons that best represent the gravel areas while providing ease of interpretation by fishers and enforcement. These restrictions will be implemented after the baseline study period with a non-regulatory approach based on education and coordination with the fleet, self-regulation through the fleet, and general OSP monitoring of the site. Annual feedback from the fleet, OSP and ODFW will determine if self-regulation is effective at keeping the crab fleet from setting crab pots on the gravel beds. If self-regulation is not effective, as determined by ODFW and the Community Team, ODFW will shift to a regulatory approach. Both MPAs prohibit new ocean development. For purposes of this analysis, only the west MPA is considered complementary to the marine reserve because it reduces socio-economic impacts compared with the OPAC site, while maintaining most of the ecological benefits with the protections to groundfish species likely to respond to area closure. The west MPA would add 22.4 km<sup>2</sup>, resulting in a total area site area of 55.2 km<sup>2</sup>. Due to the extractive use of shoreside fishing for fish species and crab in the shoreside MPA, this MPA does not add protections for most of the species likely to respond to area closure; therefore, this analysis does not include their potential ecological benefits in developing conclusions regarding the ecological sideboard.

### **Socio-economic Sideboard:**

The final recommendation reduces the overall effects of the OPAC site to all consumptive stakeholders. Recreational boat fishers continue to see minimal to moderate effects due to the MPA's distance from shore and the distance from major ports. The communities of Garibaldi and Falcon Cove, see a great reduction in effect due to the shoreside allowances north of Oswald West and from the return of important charter areas. Astoria sees a reduced effect due to the allowances in the MPA for crab and salmon. Nehalem continues to see minimal to moderate effects from no real regain of sport or subsistence opportunity for groundfish, however, some improvement is gained for recreational salmon and crab fishing for boats that can travel to the MPA. Commercial fishers out of Nehalem should see a reduced effect due to the crab and salmon allowances inside the MPA. The final proposal would have the following effects:

- Minimally reduces the effect to commercial crabbers by returning 27% of the opportunity lost in the OPAC site.
- Reduces the effect to commercial salmon due to the size, placement, and allowances of the MPA.

- Overall no change in the effect to recreational fishing due to the size and location of the MPA which leaves most of the recreational grounds within the MR.
- Greatly reduces the effect to the charter fleet out of Garibaldi (and possibly Nehalem) by restoring the main area of use.
- Reduces the effect to the shoreside consumptive user by restoring the beach/shore area north of the headlands.
- Greatly reduces the effect to the communities of Falcon Cove/Cove Beach by restoring consumptive beach activities in the northern beach areas. Garibaldi also sees a great reduction in effect due to the northern charter areas being returned. Astoria sees a moderate reduction in effect from the allowances within the MPA for crab and salmon. The MR would still pose some minor effects on nearshore subsistence or dory boat use by fishermen from nearby communities.

### **Ecological Sideboard:**

The recommended marine reserve, combined with the complementary west MPA, is consistent with size and configuration guidelines presented in the STAC Size and Spacing report.

- Overall size of the site: The marine reserve component of the site has an alongshore length of 7.4 km, a reduction from the OPAC site but still consistent with the 5-10 km minimum alongshore length guideline. The marine reserve extends out to about 25-30 fathoms in depth. The marine reserve western boundary is a straight north south line for enforcement purposes; given the geomorphology of the coast, the northern line is at 25 fathoms and the southern extent is at approximately 30 fathoms. The complementary west MPA extends the site out to the territorial sea line (western boundary straightened for enforcement purposes) so that the combined marine reserve/MPA site includes the entire depth range in the area and meets the east-west extent guideline.
- Seafloor types and depth ranges: The marine reserve component retains the variety of seafloor types found in the OPAC site, however it reduces the outer depth range which in turn reduces the amount of gravel habitat. The complementary west MPA adds back the deeper water gravel habitat to the site. The allowance of salmon and crab fishing in the MPA may have some minimal, but unknown, effect on species diversity and trophic dynamics; however species likely to benefit from a marine reserve are still protected.
- Representation of seafloor types and depth ranges: The overall proportions of seafloor types and depths in the marine reserve component is generally representative of the area within 10 km north and south of the site. The complementary west MPA adds to the total area of deep water gravel habitat, which is afforded protection through the self-regulated prohibition of commercial crabbing in delineated gravel areas. The proportions of gravel and sand are greater and rock is lower within the site compared to the area 10 km north and south of the site.
- Species representation: Given the variety of seafloor types and depth ranges in the marine reserve and west MPA (noting the allowable activities in the west MPA), species inhabiting rocky reef, mixed and sandy bottom habitats should be well represented. The depth range of this site allows for both shallow water and mid-depth water species. The overall size in both the alongshore, east-west extent and depth allows for the protection of attached algae, sessile and habitat forming invertebrates and certain mobile benthic invertebrates. The reduction in size of the subtidal deep water mixed and sand habitats may reduce representation of subtidal mixed and sand habitat affiliated species in the marine reserve compared to the OPAC site. This is partially made up by the complementary west MPA, but the allowance of salmon and crab fishing may have some minimal, but unknown, effect on species diversity and trophic dynamics. The west MPA also completes the protected ecological corridor for all fish species in the marine reserve except salmon and crab to move to offshore waters and habitats.
- Special features and other considerations: The marine reserve and complementary MPA retains the emergent rocks, seabird nesting colonies and pinniped haulouts of the OPAC proposal. Cape Falcon is the only marine reserve evaluation site in the northern third of Oregon's coast, giving the best representation of the highly productive oceanographic area influenced by the Columbia River.



### **Decision Points 3 and 4: What is the justification for the recommended changes to the OPAC recommended marine reserve boundaries? Reassessment: what are the socioeconomic impacts and the individual and collective ecological benefits of the scenario?**

All voting members of the Cape Falcon community team voted in support of some type of modified marine reserve at the Cape Falcon site, but could not agree on the exact size, shape and conditions associated with the marine reserve. The lack of stronger support for a compromise site to improve the balance between the sideboards does not negate the valuable information and input associated with the community team process. ODFW is using this collective information and input to recommend a modified proposal to decrease adverse socio-economic effects where possible, while maintaining a sound enough ecological footprint to strike a better balance within the two sideboards.

**Socioeconomic:** The combined marine reserve and MPA shows a reduction in potential effects to the commercial and sport crab and salmon fisheries compared with the OPAC site. This proposal does restore important charter and shoreside fishing areas but may still pose some issues for any subsistence or small charter operators out of nearby communities, such as Nehalem. This is why the shift in the southern boundary did not incorporate the larger rocks just south of the boundary, because of their importance to small craft and charter groundfishing boats launching from the Nehalem River. The reduction in socioeconomic impact to all fisheries compared to the OPAC site, results in this site meeting the socioeconomic sideboard.

It should be noted that these effects were not applied at the individual vessel level and that the consensus of all reviewers and analysts is that the commercial crabbing and salmon effect shown do not represent the true opportunity loss to the fleet. Because crab and salmon are considered a migratory and mobile species it is expected that those potential opportunity losses to the fleets from a proposed marine reserve would be accounted for and the effects balanced over the season as the fleets continue to fish at the same or similar level along the coast.

**Ecological:** ODFW's recommended modifications to the OPAC site to meet the socioeconomic sideboard still allow the site to meet the ecological sideboard. The marine reserve component and complementary west MPA provide an area of suitable size, variety of seafloor types, depth ranges and species representation to meet the ecological sideboard. Shifting the northern boundary slightly south to allow important charter groundfish fishing does lose some ecologically important rocky habitat for the reserve. To help compensate, the southern boundary was shifted slightly south to capture a shallower rocky habitat and more gravel habitat that were excluded from the original OPAC site. Turning the western portion of the site into an MPA to address socioeconomic impacts to salmon and crab fisheries does exclude having a corridor of full protection to the extent of the Territorial Sea. Although salmon and crab are not species expected to benefit significantly from marine reserves, the effect on trophic dynamics and species diversity is unknown. ODFW does not believe this unknown effect is significant enough in this small area to confound the evaluation of the sight, but encourages research on this topic and is committed to adaptive management of the site based on new scientific information. Regardless, to help compensate, the MPA only extends shoreward to the 25 fathom line in the north and 30 fathom line in the south, and the southern boundary extension adds some sand and gravel habitats back into the reserve. With these modifications, the overall footprint of the site (MR and MPA) is larger than the original OPAC site. While not included in determining conformance with the ecological sideboard, the shoreside MPA provides some additional protections and averts future disturbances which could have resulted from potential future ocean development.

ODFW concludes that the recommendation, as modified and summarized above, meets the ecological and socioeconomic sideboards, and strikes a better overall balance within the sideboards than the OPAC site.

## Cape Falcon Analysis Table

Ecological					
Guidelines	OPAC	Final Recommendation			
<b>Alongshore length:</b> minimum range (5-10km) preferred range (10-20km)	7.0 km	7.4 km (MR); 7.4 km(MPA)			
<b>Habitat: east- west extent</b> TS= Oregon Territorial Sea	Habitat protection extends from intertidal to outer edge of TS	<b>MR:</b> Habitat protection does not extend the full extent from intertidal to outer edge of TS. <b>West MPA:</b> Provides additional protection to habitats west of the marine reserve to the extent of the TS except as affected by allowable activities.			
<b>Seafloor and depth ranges</b>	Habitats include: rocky intertidal, subtidal sand, and subtidal mixed. Subtidal rocky habitat is scattered, relatively shallow patch reefs.  Rocky intertidal habitat consists of small boulder fields at the base of cliffs and some wave-cut sandstone platforms.	No change in subtidal rocky habitat.  Increase amount of subtidal nearshore mixed habitat (0-55m) (1.0km <sup>2</sup> vs 0.7 km <sup>2</sup> OPAC), however reduces amount of deeper mixed habitat (>55m). <i>The inclusion of the MPA increases the subtidal nearshore and deep mixed habitat to greater than OPAC (4.8km<sup>2</sup> vs 3.7 km<sup>2</sup> OPAC).</i>			
<b>Special features</b>	48 emergent rocks; 2 pinniped haulouts; 14 bird nesting colonies	emergent rocks (assumed unchanged); 0 (MPA) pinniped haulouts (assumed unchanged); 0 (MPA) bird nesting colonies (assumed unchanged); 0 (MPA)			
<b>Habitat representation:</b>					
<table border="0" style="width: 100%;"> <tr> <td style="width: 30%;"></td> <td style="width: 30%; text-align: center;"><b>+/- 10 km to N and S of OPAC</b></td> <td style="width: 30%; text-align: center;"><b>TS north of Cape Blanco</b></td> </tr> </table>		<b>+/- 10 km to N and S of OPAC</b>	<b>TS north of Cape Blanco</b>		
	<b>+/- 10 km to N and S of OPAC</b>	<b>TS north of Cape Blanco</b>			
rock: 9.5 %	4.5 %	1.4%	2.2 % (MR); 1.3 % (MR + MPA)		
mixed: 1.3 %	2.7 %	7.2%	3.5% (MR); 8.7 % (MR + MPA)		
sand: 89.2 %	92.8 %	91.4%	94.4% (MR); 90.0 % (MR + MPA)		

<b>Ecological Continued</b>		
<b>Guidelines</b>	<b>OPAC</b>	<b>Final Recommendation</b>
Species likely to be afforded protection	<ol style="list-style-type: none"> <li>1. attached algae</li> <li>2. sessile &amp; habitat forming invertebrates: bryzoans, sponges*, mussels, tubeworms, marine worms, anemones</li> <li>3. Mobile benthic invertebrates: sea urchins*~, sea stars~, snails~, marine worms</li> <li>4. fish species with limited adult movement ranges: <ul style="list-style-type: none"> <li>• china rockfish</li> <li>• copper rockfish (some protection)</li> <li>• quillback rockfish</li> <li>• black rockfish ( some protection)*</li> <li>• yelloweye rockfish (some protection)<sup>1</sup></li> <li>• kelp greenling**</li> <li>• cabezon**</li> <li>• some surfperch spp.**</li> </ul> </li> <li>5. other fish species: lingcod; nest guarding males may be afforded some protection</li> </ol> <p>*Long lived invertebrate species 100+ years with limited reproductive output  ~ Species that exhibit top down predatory control  ** Species more likely to show a response (species common to the site that are fished heavily and/or top predators)</p>	<p><b>MR, compared to OPAC:</b></p> <ul style="list-style-type: none"> <li>▪ attached algae- no change</li> <li>▪ sessile invertebrates- no change</li> <li>▪ mobile benthic- no change</li> <li>▪ fish- some decrease in protection for more shore-based species</li> </ul> <p><i>West MPA in combination with the MR may provide some additional protection to species represented</i></p>

<b>Socioeconomic- possible user groups affected</b>		
<b>User Group</b>	<b>OPAC</b>	<b>Final Recommendation</b>
<b>Commercial Fishing</b>	Crab: 0.79 % of fleet wide catch – Minimally effected Salmon: Minimally effected	Crab: >20% opportunity returned – Minimally reduces effect Salmon: Reduces effect
<b>Recreational Fishing (non-charter)</b> * no spatial data available	Crab: Moderately effected Salmon: Moderately effected Groundfish: Minimally effected Shoreside: Moderately effected	Crab: No change Salmon: No change Groundfish: No change Shoreside: Reduces effect
<b>Charter Fishing</b>	18% loss of opportunity: groundfish, salmon, crab	1.4% loss of opportunity: Greatly reduces effect
<b>Communities of Place</b>	Astoria: Minimally effected Falcon Cove/Cove Beach: Highly effected Nehalem: Moderately effected Garibaldi: Moderately effected	Astoria: Reduces effect Falcon Cove/Cove Beach: Greatly reduces effect Nehalem: No change Garibaldi: Greatly reduces effect