



Photo: Lynn Lee

# Interdisciplinary Assessment of Oregon's Marine Reserves Program

*Presentation to STAC: July 19, 2022*

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Advisory Team:

Jennifer Caselle, Stefan Gelcich, Sarah Lester,  
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## Planning

## Implementation

2008

2010

2012

2014

2016

2021

2023



ODFW Program  
Established



Harvest Restrictions Begin



ODFW  
Synthesis  
Report

Check-in

## Assessment Team



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## ODFW Synthesis Report

Delivery: Jan 26, 2022

Presentation meeting date: Feb 2, 2022

Synthesis report: 165 pages

Associated Files: 6,770

Examples:

- Human Dimensions Technical appendix: 171 pages
- Ecological Monitoring Technical appendix: 42 online docs  
+ EM Methods: 8 files, 12-37 pages each

# Evaluation Criteria

## 1. Marine reserve design

O1, O3

## 2. Baseline Assessment

IPG7

## 3. Ecological factors

*Planning*

O1, O2, O3

*Program*

O1, O2, O4

## 4. Socioeconomic characteristics

O3, IPG6, IPG4

## 5. Community engagement

O4, IPG3, IPG5, IPG4

## 6. Governance

*Planning*

IPG5

*Program*

O4, IPG1, IPG3, O5

## 7. Enforcement

IPG2

## Marine Reserve Objectives

- O1: Protect special places
- O2: Replication/resilience
- O3: Avoid econ impact
- O4: Sentinel sites
- O5: Adaptive management

## Implementation Principles & Guidelines

- IPG1: Mgmt plan
- IPG2: Enforcement
- IPG3: Monitoring
- IPG4: Econ. development
- IPG5: Safe transit
- IPG6: Avoid socioecon. impact
- IPG7: Baseline data

## Overarching Evaluation Questions

**1) Were MRs and associated MPAs effectively designed and implemented to achieve the goals and objectives set forth in OPAC's 2008 Oregon Marine Reserve Policy Recommendations?**

**Generally, yes. But...**

- Cannot evaluate collective (network) ecological significance
  - Cannot assess resilience at this time
  - Need clearly defined socioeconomic indicators
  - Were adverse socioeconomic impacts worse than expected?
  - Ongoing monitoring needed
- 



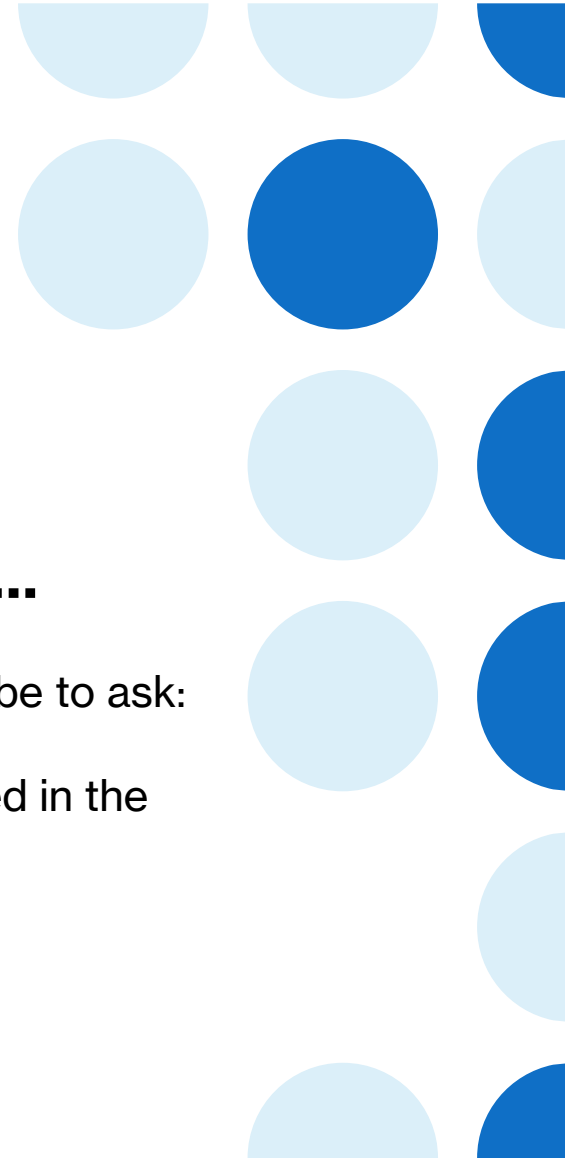
## Overarching Evaluation Questions

### 2) Did ODFW successfully execute the legislative mandates set forth regarding MR implementation?

**Generally, yes, based on the STAC Criteria. But...**

A more comprehensive approach to evaluating a MR program would be to ask:

1. What outcomes and impacts (ecological, social, etc.) are expected in the MRs?
  2. Did those expected outcomes and impacts occur?
  3. Did anything *unexpected* occur?
- 



# Overarching Evaluation Questions

## 3) Recommendations for administrative actions and legislative proposals?

- 1) **Continue & improve monitoring & adaptive management**
    - Internal ODFW capacity + ongoing collaborations
  - 2) **Hypothesis-driven research goals for Ecological Monitoring**
    - Consistent sampling procedures
    - Research on resilience
  - 3) **Strategic research plan for Human Dimensions with defined & measurable indicators**
  - 4) **Defined goals for outreach & engagement & assess those goals**
    - Staffing the Outreach & Engagement program
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IPG2

## Marine Reserve Objectives

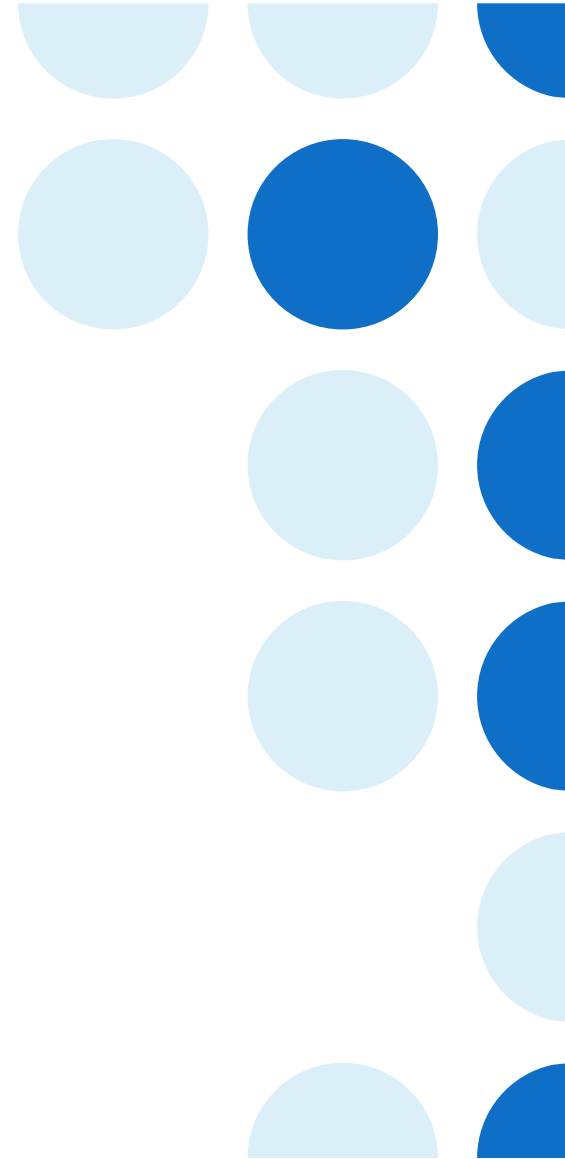
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# Challenges that Arose

- **Reserve-by-reserve application of analyses**
    - Different sampling & schedules in each reserve
    - Some evaluation criteria are network-scale (spacing)
  - **Deceptively complex evaluation criteria**
    - e.g. “spaced enough to detect statistically significant differences”
  - **Loaded/nuanced terminology**
    - ‘Resilience’, ‘Socioeconomic significance’
    - Scale-dependence of terms
  - **Aspects of Os & IPGs not directly elicited by the Questions**
    - e.g., trust-building in outreach & communication plan
- 



## Criteria 7: Enforcement

### 7.1) Is there an enforcement plan?

Yes.

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## Criteria 1: Marine Reserve Design

**1.1) Include areas of high natural biodiversity**

**1.2) Include special natural features**

Yes, but relative to what?

**1.3) Incorporate community interest**

Yes, but was it adequate?

**1.4) Fewer than 10 sites**

Yes

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## Criteria 2: Baseline Assessment

### *Ecological*

#### **2.1 – 2.3) Were baseline data collected?**

Yes, though methods varied over space & time

#### **2.4) Timing driven by MR objectives**

Yes, though less sampling than originally planned

#### **2.5) Appropriate methods?**

Yes

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## Criteria 2: Baseline Assessment

### *Human Dimensions*

#### **2.6, 2.9, 2.10) Were baseline data collected?**

Yes, with appropriate methods & timing. 'Baseline' includes sampling after the MR process was underway – important context

#### **2.7) Can methods detect change?**

Yes, though some surveys are difficult to compare among one another because of differing methods.

#### **2.8) Different data in different locations?**

Yes



## Criteria 3: Ecological Factors

### 3.1) Sites with high biodiversity?

Yes, but relative to what?

### 3.2) Key habitats represented?

Collectively, yes. No estuarine coverage.

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## Criteria 3: Ecological Factors

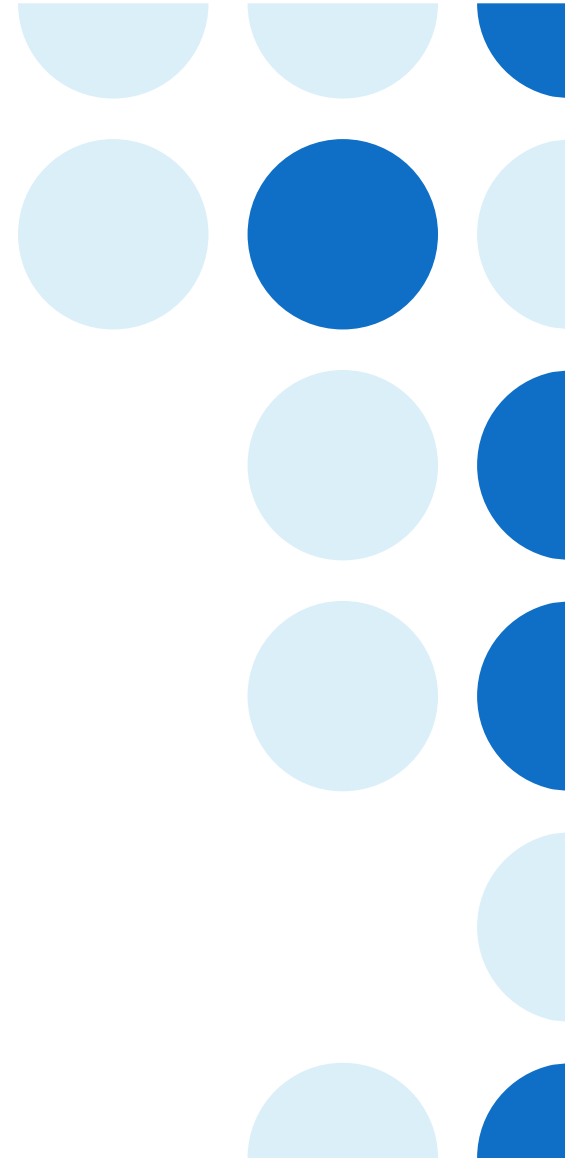
### 3.3, 3.7, 3.9) Potential for resilience to stressors?

Some hypothesized resilience benefits of marine reserves may be occurring.

ODFW lacks a clear definition of 'resilience' and a plan for monitoring/research on resilience.

Resilience in marine reserves is difficult to measure!

- **Continued long-term monitoring (oceanography & ecology), possibly focused at subset of MRs**
- **Collaborative research**



## Criteria 3: Ecological Factors

### **3.4) Were size and spacing guidelines used? Are size and spacing adequate to detect differences between reserves & controls?**

Size & spacing were considered in the design phase.

Detecting statistical differences depends on effect size, regardless of control location.

**Collaborative research could assess expected effects and their detectability.**

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## Criteria 3: Ecological Factors

### 3.5) Was species diversity measured?

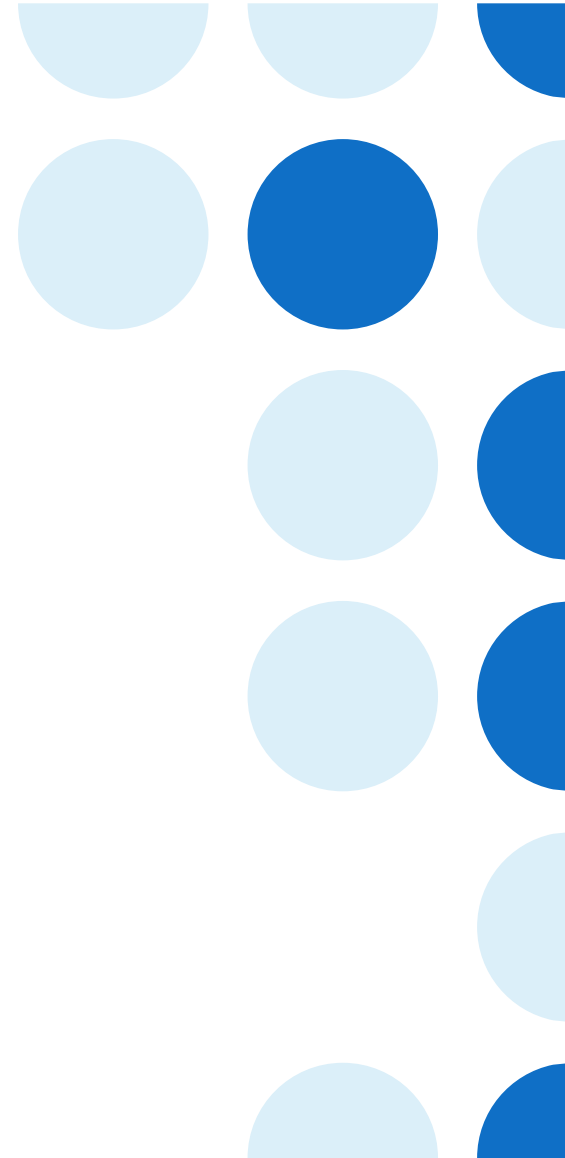
Yes, using appropriate methods.

**Longer sampling needed to detect changes over time.**

### 3.6) Were key species sampled?

Yes, using appropriate methods that were adapted over time..

- **Focus analysis on most abundant species.**
- **Continue monitoring with best, consistent methods.**



## Criteria 3: Ecological Factors

### 3.10) Open access database?

Yes.

### 3.11) Were methods adaptable?

Yes.

**Time to stop adapting & develop consistent datasets.**

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## Criteria 4: Socioeconomic Factors

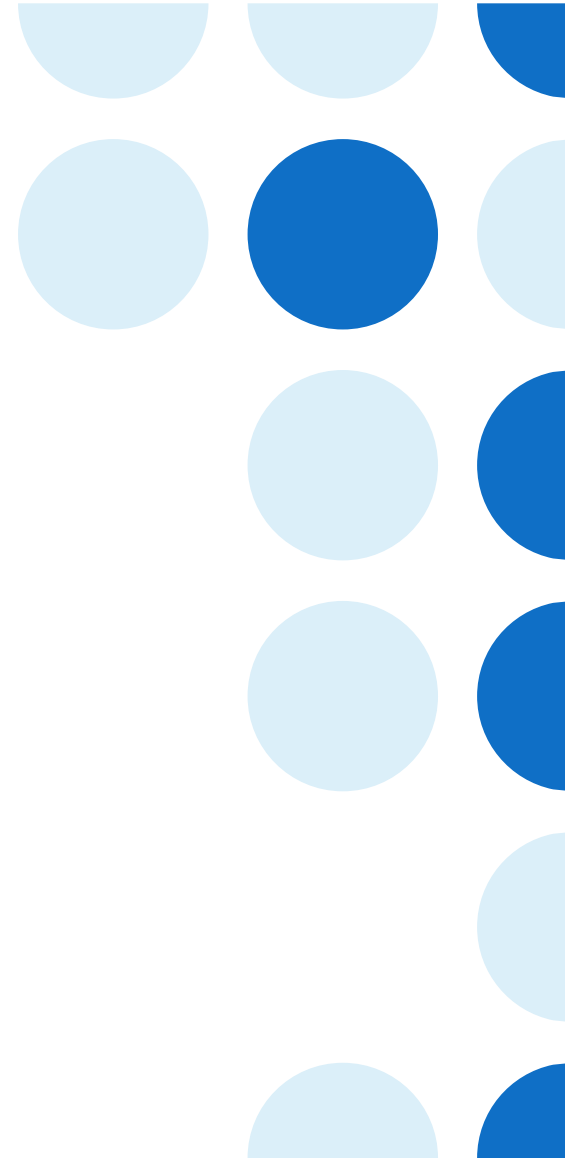
### 4.1) Criteria for adverse impacts?

No. Results were aggregated in ways that could have obscured impacts. No clear definition of 'significance' in this context.

**Develop a strategic research plan to establish criteria & monitor accordingly.**

**Consider holistic assessment frameworks that account for heterogeneity in impacts.**

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## Criteria 4: Socioeconomic Factors

### 4.2) Evidence for impacts?

Yes, both positive and negative.

- Social conflicts, but opportunities for dialogue
- Economic costs to fishermen, positive effects did not materialize

**Continue human dimensions research**

**Engage with Tribes & Tribal Interests**

**Compare observed impacts to expectations**

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## Criteria 5: Community Engagement

Yes communication happened...but was it effective?

**Assess effectiveness**

### 5.1) Was the public involved?

Yes, though unclear if Tribes were involved.

**Identify stakeholders who might be left out,  
engage them**

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## Criteria 5: Community Engagement

### 5.2) Has there been outreach & engagement?

Yes, and a strategic plan for doing so.

**Identify stakeholders who might be left out,  
engage them**

### 5.3-5.5) Has there been collaborative research?

Yes.

**Seek opportunities to diversify the suite of  
fishermen & vessels involved in research.**



## Criteria 5: Community Engagement

### 5.6) Are scientific results communicated?

Yes, but not assessed.

**Hire full-time comms staff, conduct assessments.**

### 5.7) Are regulations communicated?

Factual knowledge is low (<50%) but growing.

**Set goals & continue education**

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## Criteria 5: Community Engagement

### 5.8-5.10) Education & economic opportunities?

Yes, but economic opportunities limited to research contracts with fishing vessels.

**Encourage different types of economic development (e.g., tourism).**

**Offer diverse pathways to improve equity.**

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## Criteria 6: Governance

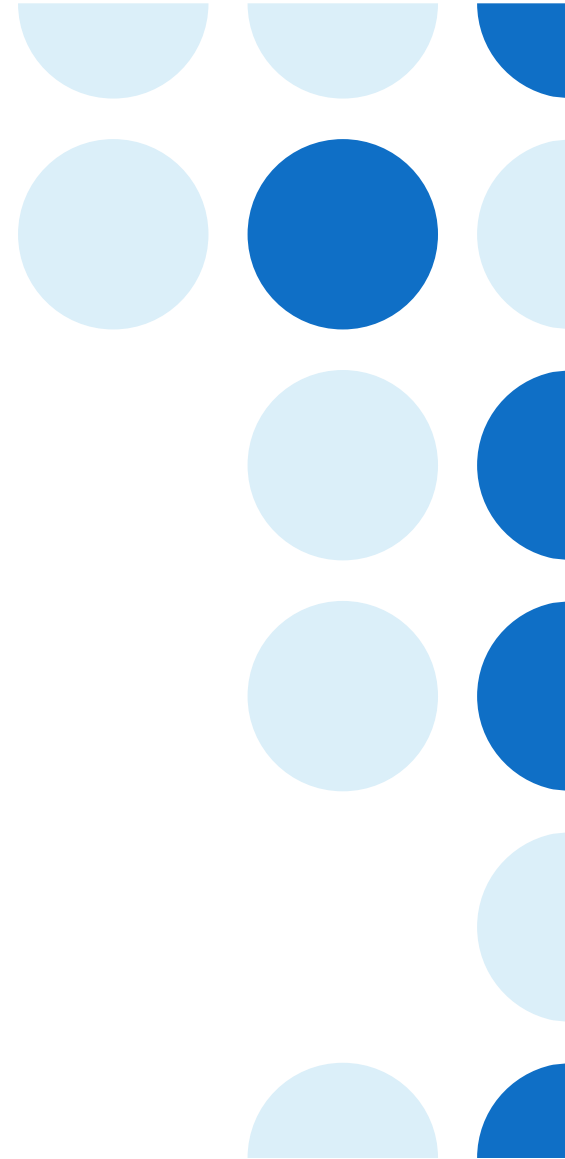
### 6.1) Regulations allow transit & access?

Yes.

### 6.2) Resource management uses monitoring data?

Yes, for ecological data. Possibly more in the future.

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## Criteria 6: Governance

### **6.3) Each Reserve has a monitoring & evaluation plan?**

No but there are overall monitoring and evaluation plans for the set of five reserves.

### **6.4) Resource management uses monitoring data?**

Yes, for ecological data. Possibly more in the future.

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## Criteria 6: Governance

**6.5-6.7) Do Reserves have management plans with SMART (specific, measurable, achievable, relevant, time-oriented) objectives? Is Adaptive Management included?**

Partly. Some but not all of the SMART components are followed. There is not an adaptive management plan past 2023.

**Develop future monitoring, research, and assessments within an adaptive management framework.**



## Recommendations for administrative actions and legislative proposals?

- 1) Continue & improve monitoring & adaptive management**
    - Internal ODFW capacity + ongoing collaborations
  - 2) Hypothesis-driven research goals for Ecological Monitoring**
    - Consistent sampling procedures
    - Research on resilience
  - 3) Strategic research plan for Human Dimensions with defined & measurable indicators**
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Oregon's Marine Reserves



Map of the five marine reserve sites that comprise Oregon's marine reserve system. The management and scientific monitoring of the sites is overseen by the Oregon Department of Fish and Wildlife.

