

Marine Life Protection Act Initiative



Marine Birds and Marine Mammals Evaluations for Round 1 External Proposed MPA Arrays in the MLPA North Coast Study Region

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MLPA Goals* and SAT Guidelines



MLPA Goals

1. To protect the natural diversity and function of **marine ecosystems**.
2. To help sustain and restore **marine life populations**.
3. To improve **recreational, educational, and study opportunities** in areas with minimal human disturbance.
4. To protect representative and unique **marine life habitats**.
5. Clear objectives, effective management, adequate enforcement, sound science.
6. To ensure that MPAs are designed and managed as **a network**.

**Note that this language represents a summary of the MLPA goals*

SAT Guidelines – No birds and mammals specific guidelines have been developed by the SAT, beyond the broad MLPA goals



Marine Birds and Marine Mammals

- Long-lived, often greater than 20 years
- Few offspring with high parental care
- Seasonally sensitive to disturbance at colonies
- Feed near the top of marine food webs



Marine Mammals Overview

- Pinnipeds 5 species
 - Steller Sea Lion*
 - Harbor Seal*
 - California Sea Lion
 - Northern Elephant Seal*
- Cetaceans 16 species
 - Harbor Porpoise*
 - Gray Whale



* Breeds in study region



Marine Birds of the Nearshore

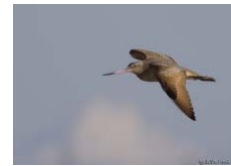
- 12 breeding species
 - Common Murre
 - Pigeon Guillemot
 - Pelagic, Brandt's, and Double-crested Cormorant
- Neritic non-breeding species
 - Loons and Grebes
 - Surf and White-winged Scoters
 - Gulls
 - Phalaropes
 - Procellariiformes



Estuarine and Marsh Birds

High seasonal numbers, high diversity, few breeders

- Shorebirds – Beach and tidal flat
Greater than 25 species
- Waterfowl – Estuarine waters
Greater than 25 species
- Waders – Marsh and Shallows
 - Herons and Egrets
- Others:
 - Raptor predators
 - Gulls and Terns
 - Belted Kingfisher





Coastal Birds, Rock and Sand Shore

- **Rocky Shoreline Birds**

- Wandering Tattler
- Black Turnstone
- Surfbird
- Black Oystercatcher*



- **Sandy Beach Foraging Birds**

High seasonal numbers, many species also use estuaries

- Sanderling
- Marbled Godwit
- Snowy Plover*



* *Breeds in study region*



Threats

- **Human Disturbance**

- To nesting colonies and rookeries: short-term loss of young and long-term loss of breeding and rest/haulout sites
- To estuarine habitats: from short term to chronic loss of foraging; energetic loss for migration and nesting
- Boats (all types), hunting (estuaries) and shoreline activities (all types)





Threats, continued

- Anthropogenic pollution
 - Oilspills, catastrophic and chronic
 - Other (e.g.: sediment contaminants, water quality)
- Fisheries bycatch
- Disturbance to neritic foraging hot spots



Methods Overview

Analyses quantify north coast study region (NCSR) marine bird and mammal populations likely to benefit from MPAs for three use categories:

1. Breeding
2. Resting
3. Foraging



Notes about Round 1 Analyses

- Evaluate by whole study region, not bioregions
- Assumption that state marine reserves (SMRs) will result in a reduced level of activity/disturbance
- Marine mammal analyses considered only proposed SMRs
- Marine bird analyses included only proposed SMRs
- Effects on benefits to birds and mammals by proposed tribal uses were not evaluated
- Analyses of External MPA Array C (ExC*) include state marine conservation areas (SMCAs) that only include proposed tribal uses since ExC did not use the SMR classification for these MPAs, as did other external arrays
- Mobile MPAs in external MPA array A were consider static for the purpose of evaluation



Marine Bird and Mammal Analyses

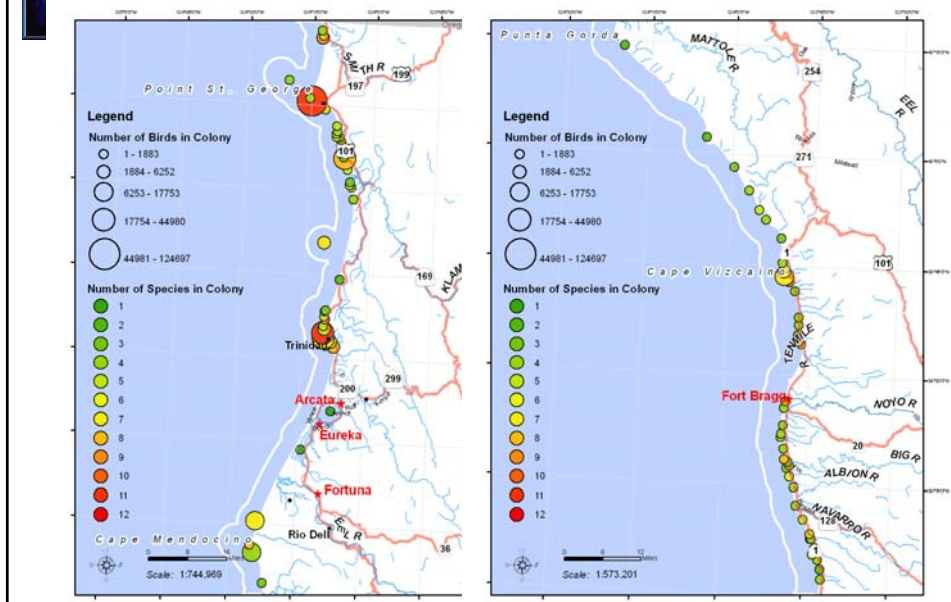
Analysis 1: Protection at Breeding Sites

Investigated:

- percent (%) of bioregion marine bird breeding populations protected
- number of pinniped rookery sites protected
- protection of important marine bird breeding hot spots
- protection of important pinniped hot spots



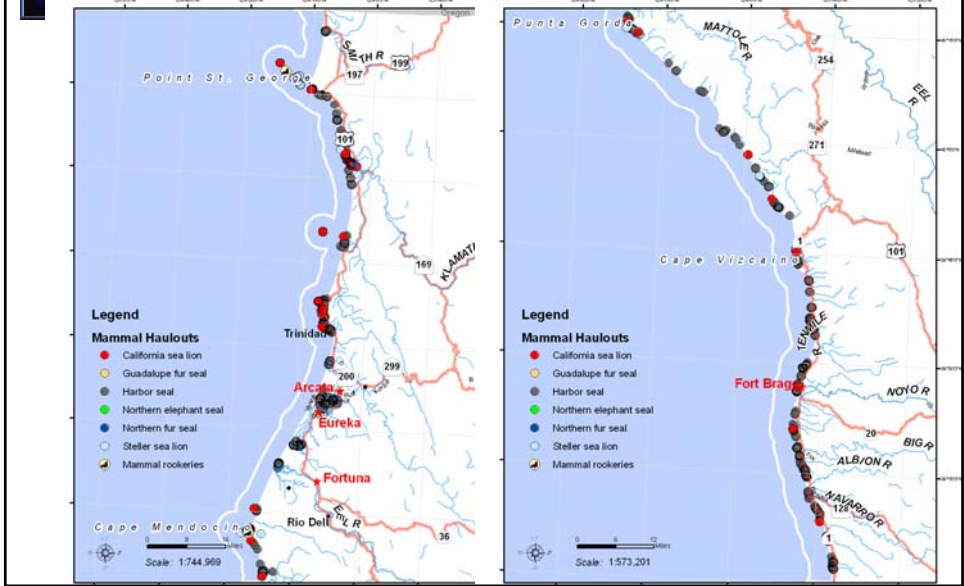
Important Seabird Breeding Sites



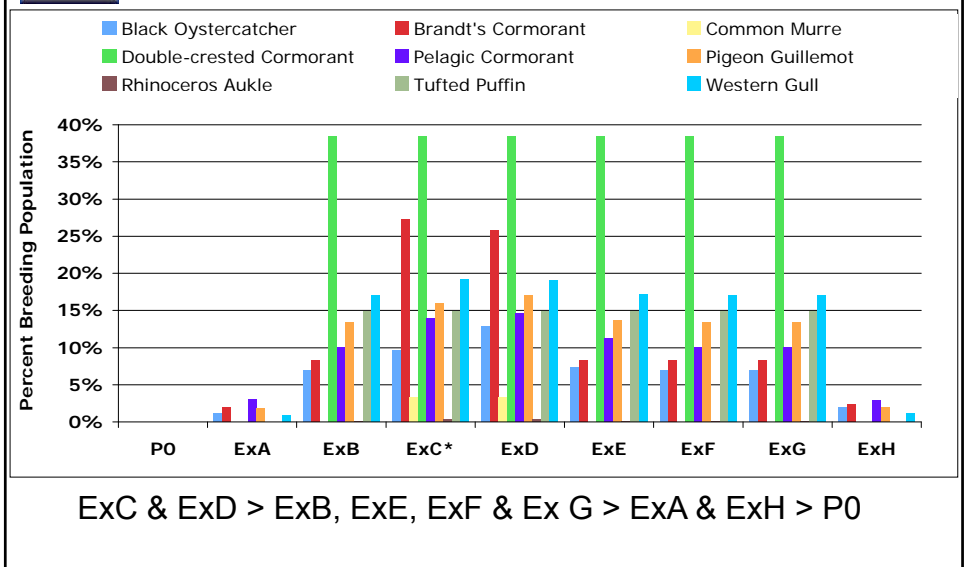
Seabird Breeding Colonies

| Species | Number of Animals in the Study Region |
|---------------------------------|---------------------------------------|
| Black Oystercatcher (BLOY) | 248 |
| Brandt's Cormorant (BRCO) | 13105 |
| Cassin's Auklet (CAAU) | 4833 |
| Common Murre (COMU) | 258010 |
| Double-crested Cormorant (DCCO) | 2873 |
| Fork-tailed Storm-Petrel (FTSP) | 419 |
| Leach's Storm-Petrel (LESP) | 9414 |
| Pelagic Cormorant (PECO) | 5675 |
| Pigeon Guillemot (PIGU) | 3148 |
| Rhinoceros Auklet (RHAU) | 1063 |
| Tufted Puffin (TUPU) | 181 |
| Western Gull (WEGU) | 4046 |
| Study Region Total | 303014 |

Important Pinniped Haulouts



Percent of Breeding Population in SMRs



Marine Bird and Mammal Hot Spots



Marine Bird Breeding Hot Spots

| Breeding Hot Spots | ExC | ExD | ExE |
|--------------------|-------------------------|--------------------|--------------------|
| Castle Rock | | | |
| False Klamath Rock | False Klamath Cove SMCA | False Klamath SMCA | False Klamath SMCA |
| Green Rock | | | |
| Flatiron Rock | | | |
| False Cape Rocks | | | False Cape SMCA |
| Steamboat Rock | | | |
| Rockport Rocks | Vizcaino SMCA | Usal SMR | Vizcaino SMCA |
| Cape Viscaino | Vizcaino SMCA | Usal SMR | Vizcaino SMCA |

- P0, ExA, ExB, ExF, ExG, and ExH did not capture any marine bird breeding hot spots



Marine Mammal Hot Spots

| | Population Hot Spots | | | | | |
|-----|----------------------|-------------------|--|--------------------------|--------------------------|--------------------|
| | SW Seal Rock* | Sugarloaf Island* | Vicinity of Castle Rock, Crescent City | South Bay, Humboldt Bay | Arcata Bay, Humboldt Bay | Mouth of Eel River |
| PO | | | | | | |
| ExA | | | | Humboldt Bay SMRMA | | |
| ExB | | | | Humboldt Bay SMRMA | | |
| ExC | | | | Humboldt Bay SMRMA | | |
| ExD | | | | South Humboldt Bay SMCA | | |
| ExE | | | | South Humboldt Bay SMRMA | | |
| ExF | | | | Humboldt Bay SMRMA | | |
| ExG | | | | Humboldt Bay SMRMA | | |
| ExH | | | | Humboldt Bay SMRMA | | |

* These locations contain the two Steller sea lion rookeries in the study region



Marine Bird and Mammal Analyses

Analysis 2: Protection at Roosting and Haulout Sites

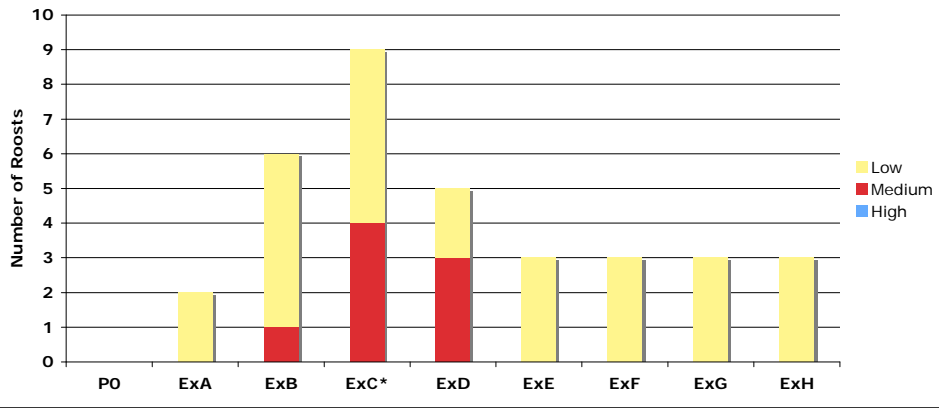
Investigated:

- percent (%) of study region populations protected for pinnipeds
- number and size of Brown Pelican roosts





Brown Pelican Roosts in SMRs



ExC > ExD > ExB > ExE, ExF, ExG & ExH > Ex A > P0

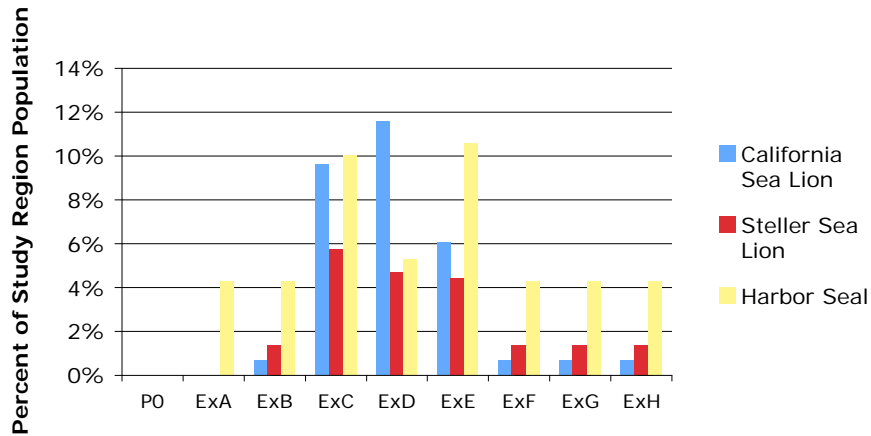


Pinniped Haulouts

| | No. of Species | California Sea Lion | Steller Sea Lion | Harbor Seal | Total Number of Animals | Percent of Study Region Population |
|--------------------|----------------|---------------------|------------------|-------------|-------------------------|------------------------------------|
| P0 | 0 | 0 | 0 | 0 | 0 | 0.00% |
| ExA | 1 | 0 | 0 | 380 | 380 | 1.29% |
| ExB | 3 | 93 | 94 | 383 | 570 | 1.94% |
| ExC* | 3 | 1311 | 396 | 893 | 2600 | 8.84% |
| ExD | 3 | 1577 | 326 | 472 | 2375 | 8.07% |
| ExE | 3 | 829 | 307 | 944 | 2080 | 7.07% |
| ExF | 3 | 93 | 94 | 383 | 570 | 1.94% |
| ExG | 3 | 93 | 94 | 383 | 570 | 1.94% |
| ExH | 3 | 93 | 94 | 383 | 570 | 1.94% |
| Study Region Total | 3 | 13608 | 6905 | 8902 | 29415 | 100% |



Percent of Haulout Population



ExC > ExD > ExE > ExB, ExF, ExG, & ExH > ExA > P0



Marine Bird and Mammal Analyses

Analysis 3: Protection at Foraging Sites

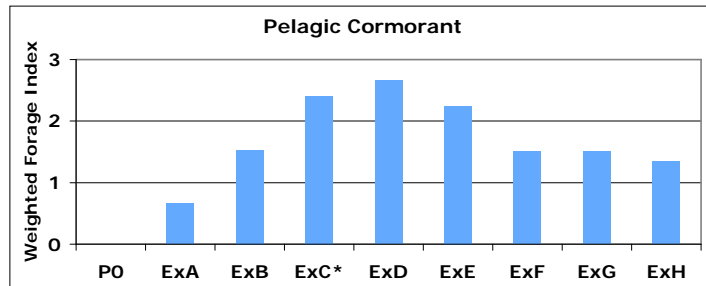
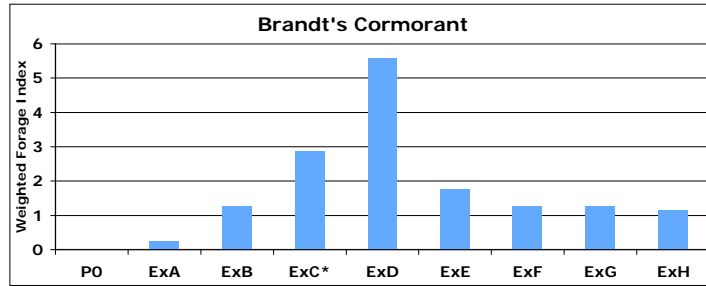
Investigated:

- amount of near-colony foraging area protected
- amount of neritic foraging area protected

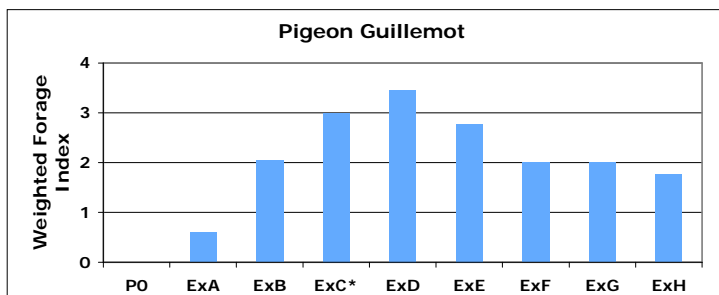
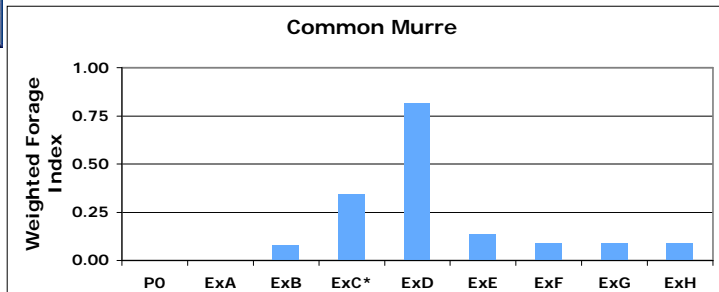




Near-colony Foraging Areas

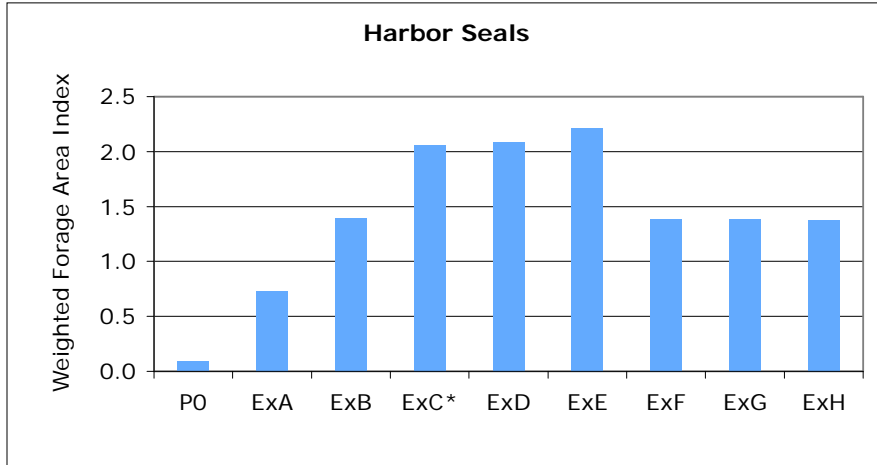


Near-colony Foraging Areas





Near-colony Foraging Areas



ExE > ExC & ExD > ExB, ExF, ExG, & ExH > ExA > P0



Neritic Foraging Area Analysis

Gray whale foraging index within proposed MPAs

| MPA Proposal | MPA Name | Whales Weighted Forage Index | Sum of weighted index in SMRs |
|--------------|---------------------------|------------------------------|-------------------------------|
| P0 | None | 0.00 | 0 |
| ExA | Crescent City Mobile SMCA | 1.01 | 0 |
| | Crescent City Mobile SMCA | 4.87 | |
| | Trinidad Mobile SMCA | 5.22 | |
| ExB | None | 0.00 | 0 |
| ExC | False Klamath Cove SMCA | 2.87 | 0 |
| ExD | False Klamath SMCA | 4.45 | 0 |
| | Patrick's Point SMCA | 4.16 | |
| ExE | False Klamath SMCA | 5.70 | 0 |
| ExF | None | 0.00 | 0 |
| ExG | None | 0.00 | 0 |
| ExH | None | 0.00 | 0 |



Marine Bird and Mammal Analyses

Analysis 4: Protection in Estuarine and Coastal Habitats

Investigated number of estuaries and percent of available tidal flat, coastal marsh, Humboldt Bay eelgrass and beach habitat protected



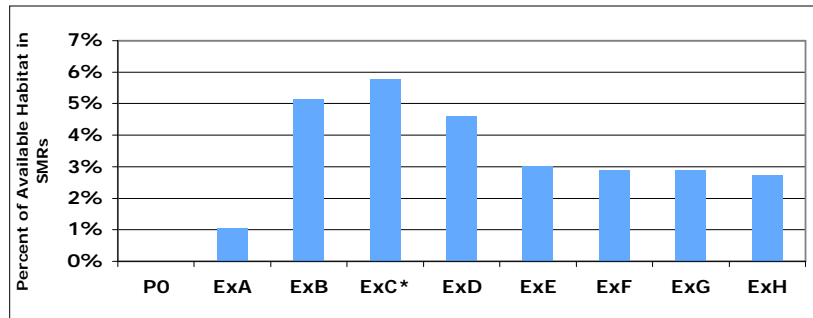
Estuarine and Coastal Habitat

- Estuaries
 - ExA, ExB, ExC, ExD, ExF and ExG contained 2 estuaries in SMRs: Ten Mile Estuary SMR and Navarro River Estuary SMR
 - ExE and ExH included only Ten Mile Estuary SMR
- Coastal Marsh
 - ExA, ExB, ExC, ExD, ExF and ExG contained coastal marsh areas in Ten Mile Estuary SMR and Navarro River Estuary SMR
 - ExE and ExH contained coastal marsh area in Ten Mile Estuary SMR
- Tidal Flats
 - ExA, ExB, ExC, ExD, ExF, and ExG contained tidal flats area in Navarro River Estuary SMR
 - ExE and ExH did not contain tidal flats in SMRs



Estuarine and Coastal Habitat

Beaches



Ranking for beaches:

ExC > ExB > ExD > ExE > ExF & ExG > ExH > ExA

Humboldt Bay Eelgrass

No external arrays included SMRs that contained Humboldt Bay eelgrass



Summary of Round 1 Analyses

- Overall, ExC and ExD provide the most benefits to marine birds and mammals, including only SMRs
- Considering SMCAs, the nature of allowed activities and additional hotspot colonies included, ExE performs best in protecting nesting colonies and neritic foraging sites
- ExC, ExD and ExE also afford the most protection of marine mammal haulouts; marine mammal analyses considered only proposed SMRs
- No marine mammal hot spots or gray whale foraging areas were captured in SMRs



Summary of Round 1 Analyses

| Analysis | P0 | ExA | ExB | ExC | ExD | ExE | ExF | ExG | ExH |
|--------------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|
| Seabird Breeding Colonies | - | - | | + | + | | | | - |
| Sea Lion Breeding Rookeries | - | - | - | - | - | - | - | - | - |
| Seabird Roost Sites | | | | + | | | | | |
| Seabird Breeding Hot Spots | | | | + | + | | | | |
| Pinniped Hot Spots | | | | + | + | + | | | |
| Brandt's Cormorant Foraging | | | | | + | | | | |
| Common Murre Foraging | | | | | + | | | | |
| Pigeon Guillemot Foraging | | | | + | + | + | | | |
| Pelagic Cormorant Foraging | | | | + | + | + | | | |
| Gray Whale Foraging | - | - | - | - | - | - | - | - | - |
| Harbor Seal Foraging | | | | + | + | + | | | |
| Estuarine and Coastal Habitats | = | = | = | = | = | = | = | = | = |



Analyses in Progress

- Pinniped Rookery Analysis
 - California sea lion: No rookeries
 - Steller sea lion: One rookery at SW Seal Rock and one rookery at Sugarloaf Island
 - Harbor seal: Analyzing and evaluating data
- Neritic Foraging Analysis
 - Gray whale analysis: Running
 - Marine bird and mammal analysis: In progress
- Waterfowl Analysis
 - Analyzing and evaluating data