

PG&E WaveConnect
Humboldt Working Group
Permitting Authority
Subcommittee Meeting

January 7, 2010



Humboldt Working Group (HWG) Groundrules

- Participate in an active and focused manner – commit to process success.
- Interact with all other members respectfully.
- Communicate interests, not positions.
- Be brief in communications, and be prepared.
- Help involve all.
- Seek solutions for all.
- Commit to a good faith effort.
- Share relevant information.
- Communicate effectively—open, frank communications with the larger community, “not-for-attribution” to individuals in the group.
- Attend all meetings; start on time.
- Keep cell phones on silent.



Facilitator Responsibilities

- Maintain a neutral position as project issues are discussed.
- Help the group accomplish its objectives.
- Help guide the discussion.
- Enforce participant ground rules.
- Help involve all.
- Ask “why” to clarify interests.
- Ensure a smooth process.
- Retain confidential information as confidential to individual participants.
- Manage time.
- Track actions, next steps, deadlines.



Agenda

- I. Introductions/Session Overview.....9:00 – 9:15 am
- II. Action Items review.....9:15 – 9:30 am
- III. Monitoring and Adaptive Management Approach.....
.....9:30 – 11:45 am
- IV. Lunch.....11:45 am – 12:30 pm
- V. Presentation on green sturgeon.....
.....12:30 – 1:00 pm
- VI. Cont'd discussion of Monitoring Objectives and Approach.....
.....1:00 – 2:45 pm
- VII. Break.....2:45 – 3:00 pm
- IX. HWG Permitting Authority Subcommittee Integrated Schedule.....
.....3:00 – 3:50 pm
- IX. Next Steps, Adjourn.....3:50 – 4:00 pm



HWG 2010 Schedule

- HWG Meetings
 - January 6
 - February 1
 - March 9
 - April 6
 - May 4
 - June 1
 - July 13
- HWG Permitting Authority Subcommittee Meetings
 - January 7
 - February 2
 - March 10
 - April 7
 - May 5
 - June 2
 - July 14

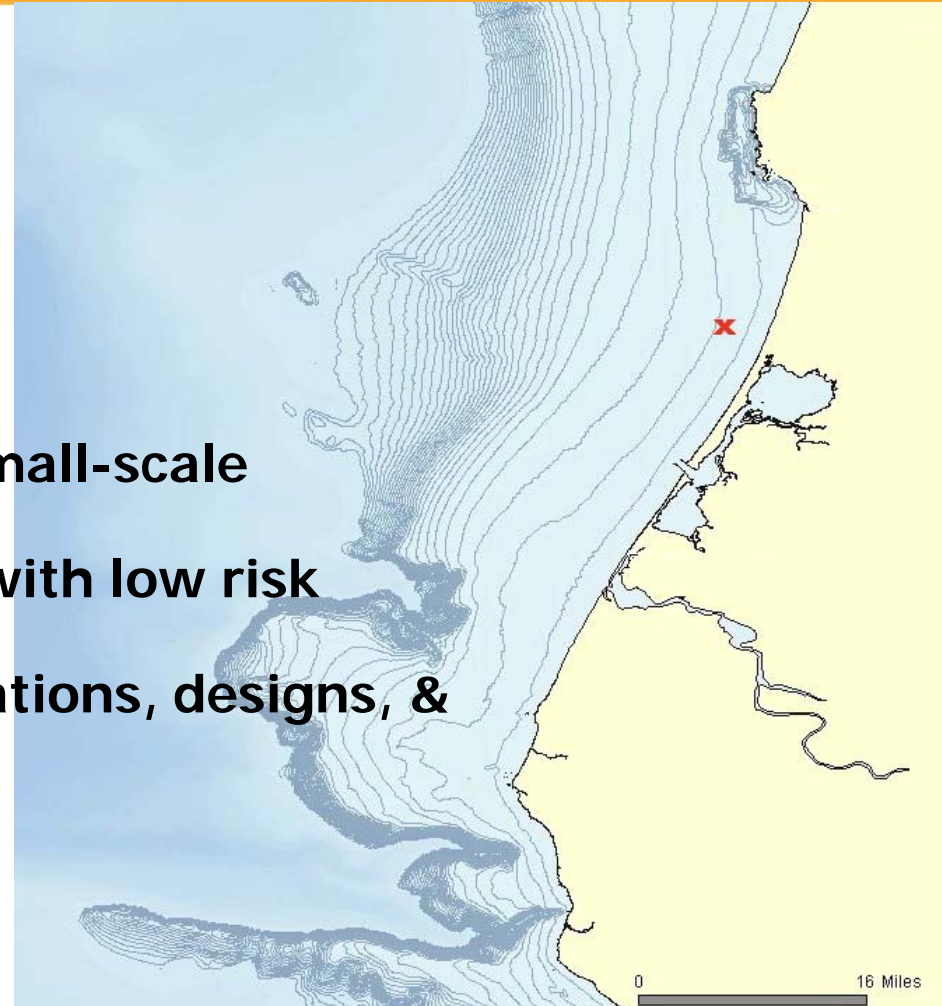


Monitoring & Adaptive Management for PG&E Humboldt WaveConnect



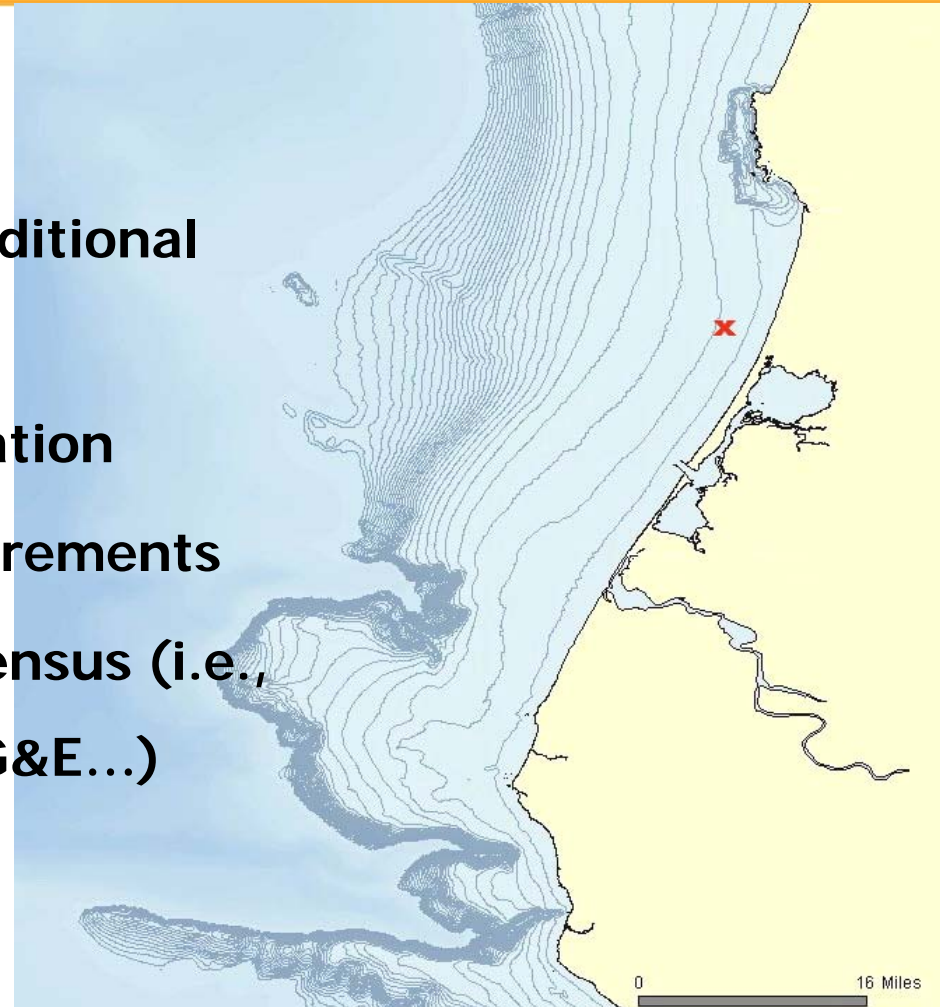
Humboldt WaveConnect Project

- **Short-term duration**
- **Temporary effects**
- **Small footprint**
- **Impacts probably local and small-scale**
- **Opportunity to study effects with low risk**
- **Informs future WEC configurations, designs, & mitigation measures**

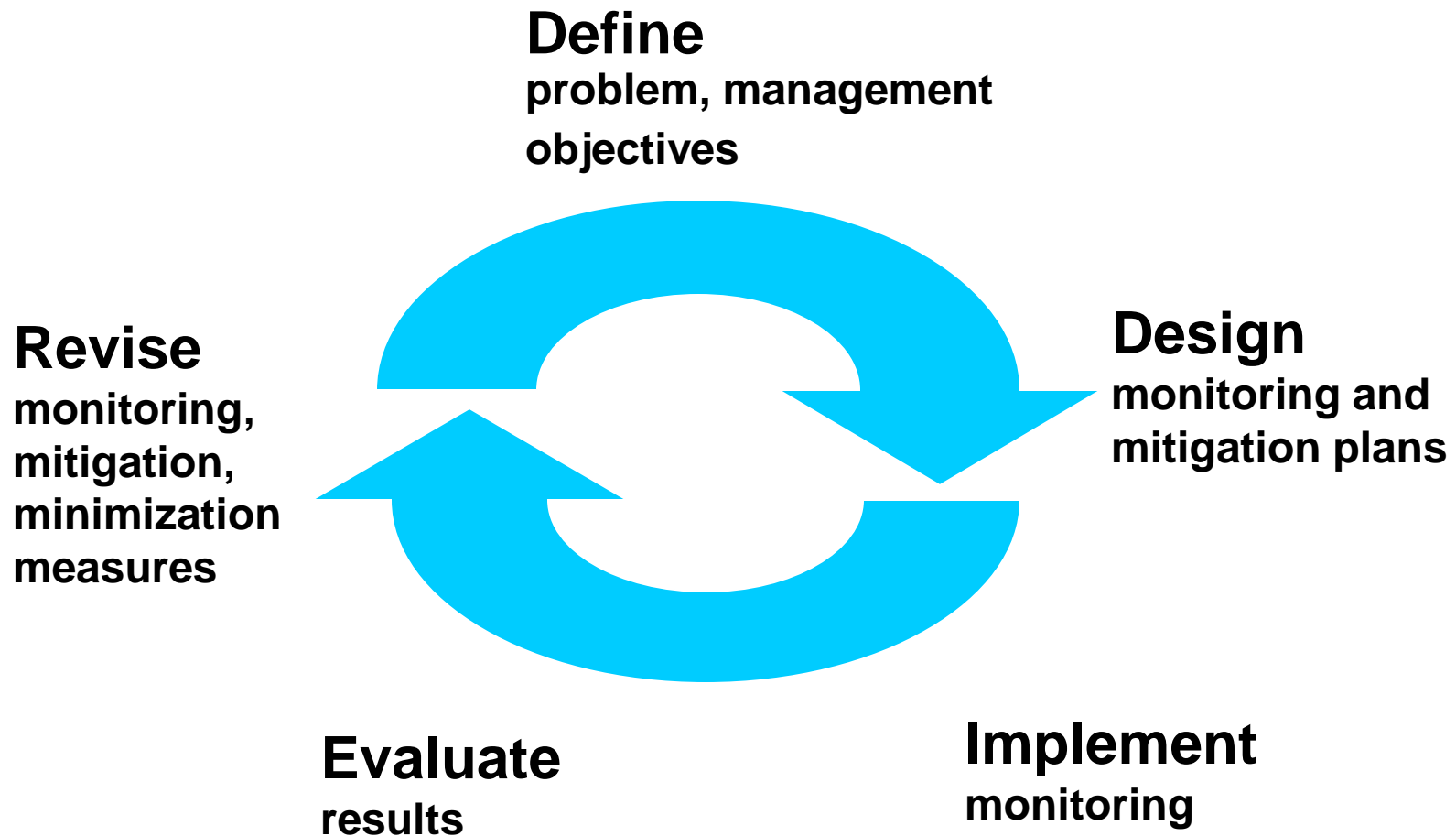


Monitoring & Adaptive Management

- Address scientific uncertainty
- Screening criteria to trigger additional mitigation if necessary
- Objective-driven effects evaluation
- Monitoring and reporting requirements
- Decisions by stakeholder consensus (i.e., FERC, USFWS, NOAA, CDFG, PG&E...)



Monitoring & Adaptive Management



Pinnipeds Likely to Occur in Project Area

Common and coastal, haul out on rocks and/or beaches

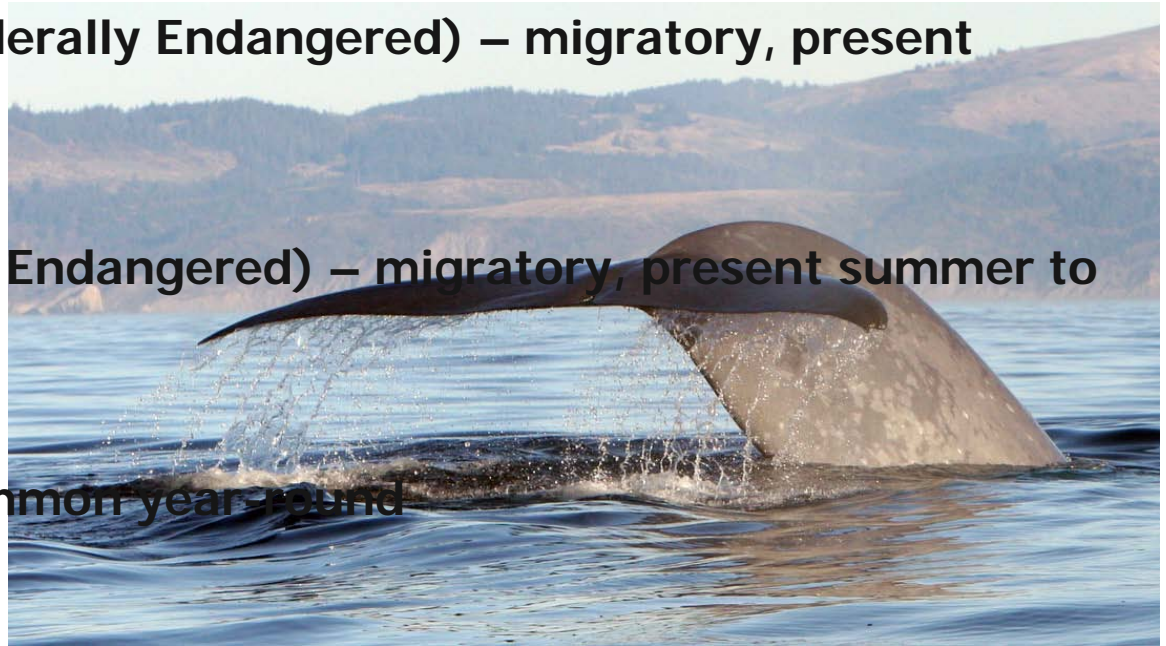
- Harbor seal – present year-round, breeds here
- Steller sealion (Federally Threatened) – present year-round, breeds at Cape Mendocino
- California sea lion – fall and spring peaks, breeds in southern California



Cetaceans Likely to Occur in Project Area

Common in Project Area

- Gray whale – migrate past twice a year, some residents
- Humpback whale (Federally Endangered) – migratory, present spring to fall
- Blue whale (Federally Endangered) – migratory, present summer to fall, ephemeral
- Harbor porpoise – common year-round



Cetaceans Likely to Occur in Project Area

Rare, occasional, ephemeral in Project Area, typically farther offshore

- **Minke whale**
- **Transient killer whale**
- **Dall's porpoise**
- **Risso's dolphin**
- **Pacific white-sided dolphin**
- **Northern right whale dolphin**



Marine Mammals Unlikely in Project area, Could Occur in “Acoustic Area”

Off-shelf distribution, could detect WECs acoustically

- **Pinnipeds**

- Northern elephant seal
- Northern fur seal

- **Cetaceans**

- Fin whale
(Federally Endangered)
- Sperm whale (Federally Endangered)



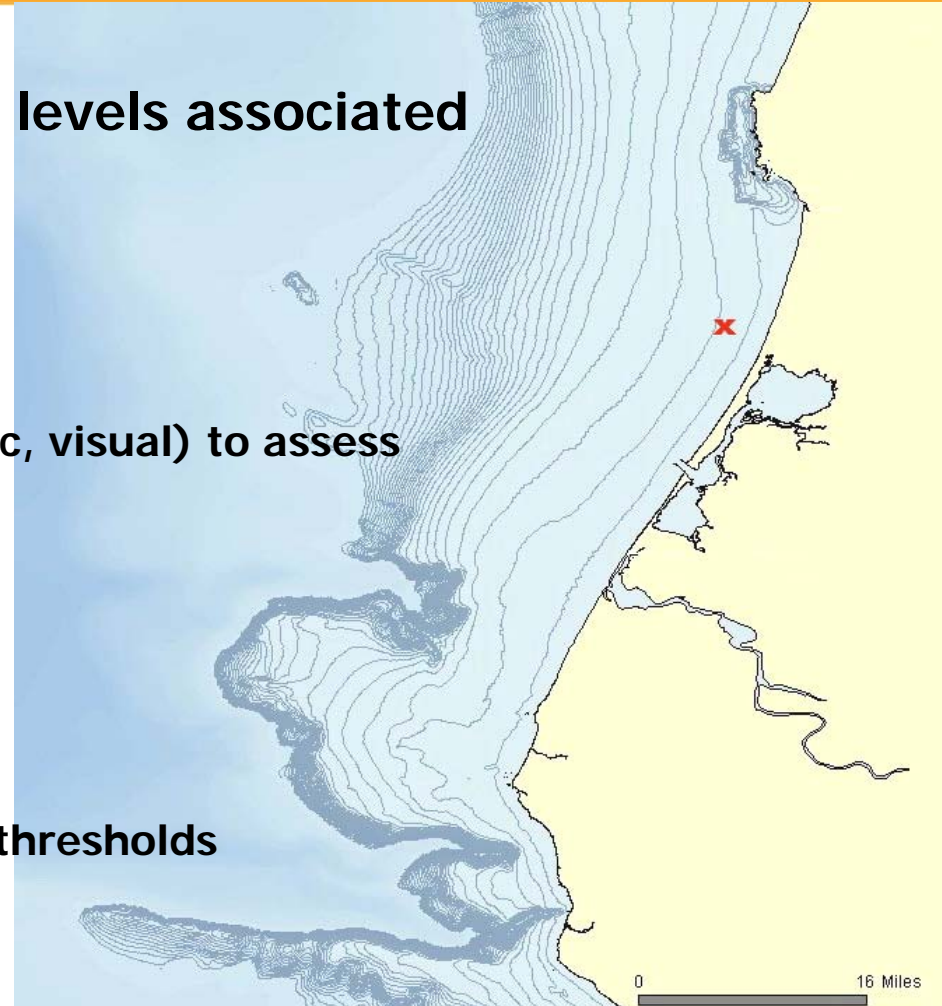
Potential Effects on Marine Mammals

- **Noise**
- **Electric and magnetic fields (EMF)**
- **Entanglement**
- **Collisions with vessels**
- **Attraction to WECs for foraging, haul-out**



Noise

- **Objective: What are the noise levels associated with the project?**
- **Monitoring & Adaptive Management**
 - Marine mammal surveys (acoustic, visual) to assess exposure
 - Characterize ambient noise
 - Measure noise from WECs
 - Compare with known sensitivity thresholds
 - Model masking effects



Entanglement

- Objectives: Does lost gear entangle with the WECs and moorings? Do marine mammals become entangled?
- Monitoring & Adaptive Management
 - Monitor and remove lost fishing gear from WECs
 - Marine mammal surveys (acoustic, visual) to assess exposure
 - If entanglement occurs, adjust frequency of lost gear removal
 - Install “pingers” to repel marine mammals

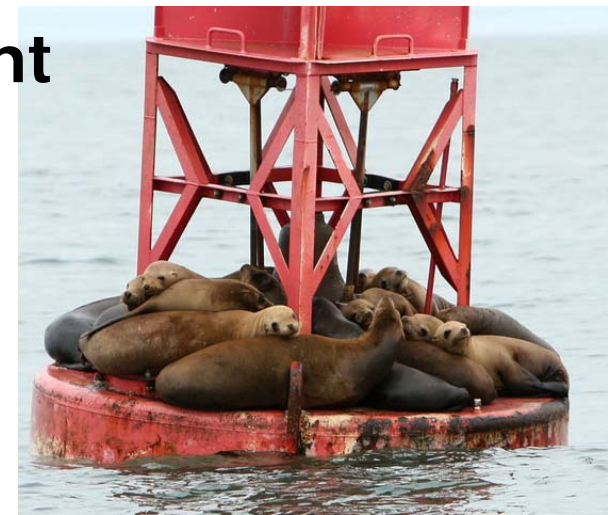
Collisions with vessels

- **Objective: Are vessels colliding with marine mammals?**
- **Monitoring & Adaptive Management**
 - Marine mammals surveys (visual, acoustic) to assess exposure
 - Marine mammal observers



Attraction to WECs for foraging, haul-out

- **Potential indirect effects**
 - Increased exposure to other impacts (i.e., entanglement)
 - Increased predation on listed fish (salmon, smelt)
- **Monitoring & Adaptive Management**
 - Modify WECs to prevent pinniped haul-outs
 - Marine mammal surveys (acoustic, visual)
 - Install “pingers” to repel marine mammals



T&E Fish and EFH

- **Threatened & Endangered (T&E) Fish Species**
 - Pacific salmon- 6 Evolutionarily Significant Units (ESU) and 2 Distinct Population Segments (DPS)
 - North American green sturgeon southern DPS (Federally Threatened)
 - Southern eulachon DPS (Federally Proposed Threatened)
 - Longfin smelt (State Threatened)
- **Essential Fish Habitat (EFH)**
 - Rockfish, roundfish, flatfish, elasmobranchs, highly migratory species, coastal pelagics, Pacific salmon



Potential Risks to T&E Fish and EFH

- **Artificial reef, Fish Aggregating**

Device (FAD) effects

- **Biofouling**

- **Electric and magnetic fields (EMF)**



Artificial reef, FAD effects

- **Potential indirect effects**
 - Increased predation on listed fish species by marine mammals and fish predators
- **Monitoring & Adaptive Management**
 - Modify WECs to prevent pinniped haul-outs
 - Fish, invertebrate abundance & distribution monitoring
 - Gut content analysis of fish predators

Biofouling

- **Potential indirect effects**
 - **Habitat modification, changing species composition**
 - **Invasive species**
- **Monitoring & Adaptive Management**
 - **Operations and maintenance includes remotely operated vehicle monitoring, dive surveys**
 - **Settlement plates if biofouling occurs**

Electric and Magnetic Fields

- Species potentially affected:
 - Marine mammals
 - Green sturgeon
 - Salmonids
 - Elasmobranchs
 - Dungeness crab



Electric and Magnetic Fields

- **Potential effects**
 - Changes in behavior, navigation, orientation
 - Interruption of migration for sturgeon, salmon
- **Monitoring & Adaptive Management**
 - Shield / bury cables
 - Measure baseline electric and magnetic fields (EMF), EMF from WEC devices, compare to known sensitivity thresholds
 - Monitor for presence of tagged, migrating fishes (e.g., sturgeon, salmonids)

Seabirds

- **Potential Effects**

- Attraction to lighting & collision with structures
- Use of structures as nesting or roosting sites
- Disturbance of foraging & resting

- **Monitoring & Adaptive Management**

- Observations of flight patterns & potential collisions
- Surveys of use of above-water structures
- Monitoring of trends in use of foraging & resting habitat within project area (build on existing monitoring data)



Construction Zone Monitoring

- Biological resources construction monitoring
 - Marine mammal monitoring
 - Terrestrial plants and wildlife monitoring
- Storm water discharge monitoring
- Horizontal Directional Drilling mud release monitoring
- Archaeological monitoring of excavation pit

Monitoring Plan Structure

- Define monitoring objectives (e.g., Do WEC devices, anchors, moorings act as artificial reefs or FADs?)
- Describe approach, methods, and rationale
- Monitoring schedule and frequency (space, time, seasonality)
- Monitoring metrics and analysis
- Constraints, limitations and feasibility
- Adaptive management, including triggers and outcomes if possible.

Next Steps

- Ongoing discussion with HWG and Permitting Authority Subcommittee
- Draft monitoring plans
- Distribute monitoring plans with draft pilot license application (DPLA)
- HWG and Permitting Authority Subcommittee to review and collaboratively refine plans for final pilot license application (FPLA)

Next Steps

