Marine Mammal And Protected Species Environmental Assessment and Mitigation To Inform the Permitting Process

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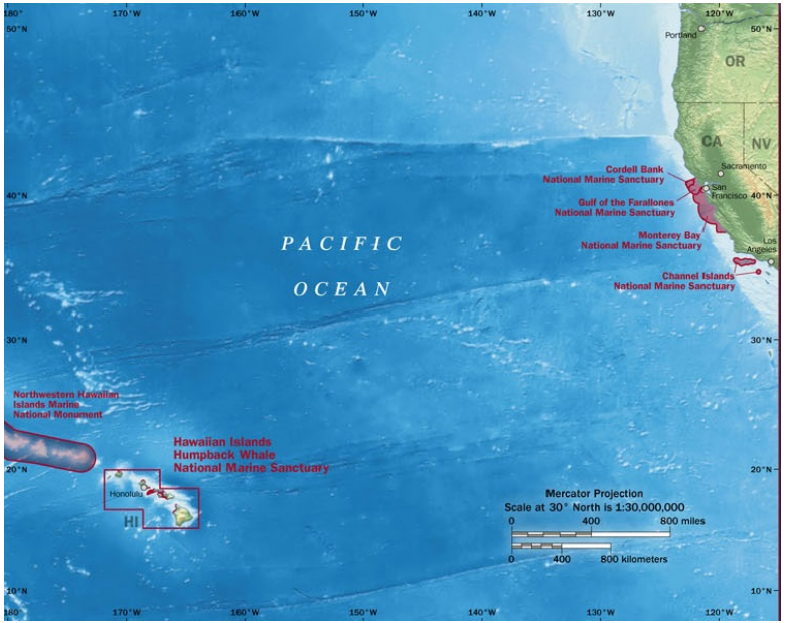
LEGAL FRAMEWORK

- Magnuson-Stevens Fisheries Management Act (MSA)
- Coastal Zone Management Act (CZMA)
- National Marine Sanctuaries Act (NMSA)
- Migratory Bird Treaty Act (MBTA)
- Marine Mammal Protection Act (MMPA)
- Endangered Species Act (ESA)
- Outer Continental Shelf Lands Act (OCSLA)
- National Environmental Policy Act (NEPA)



Pacific National Marine Sanctuaries

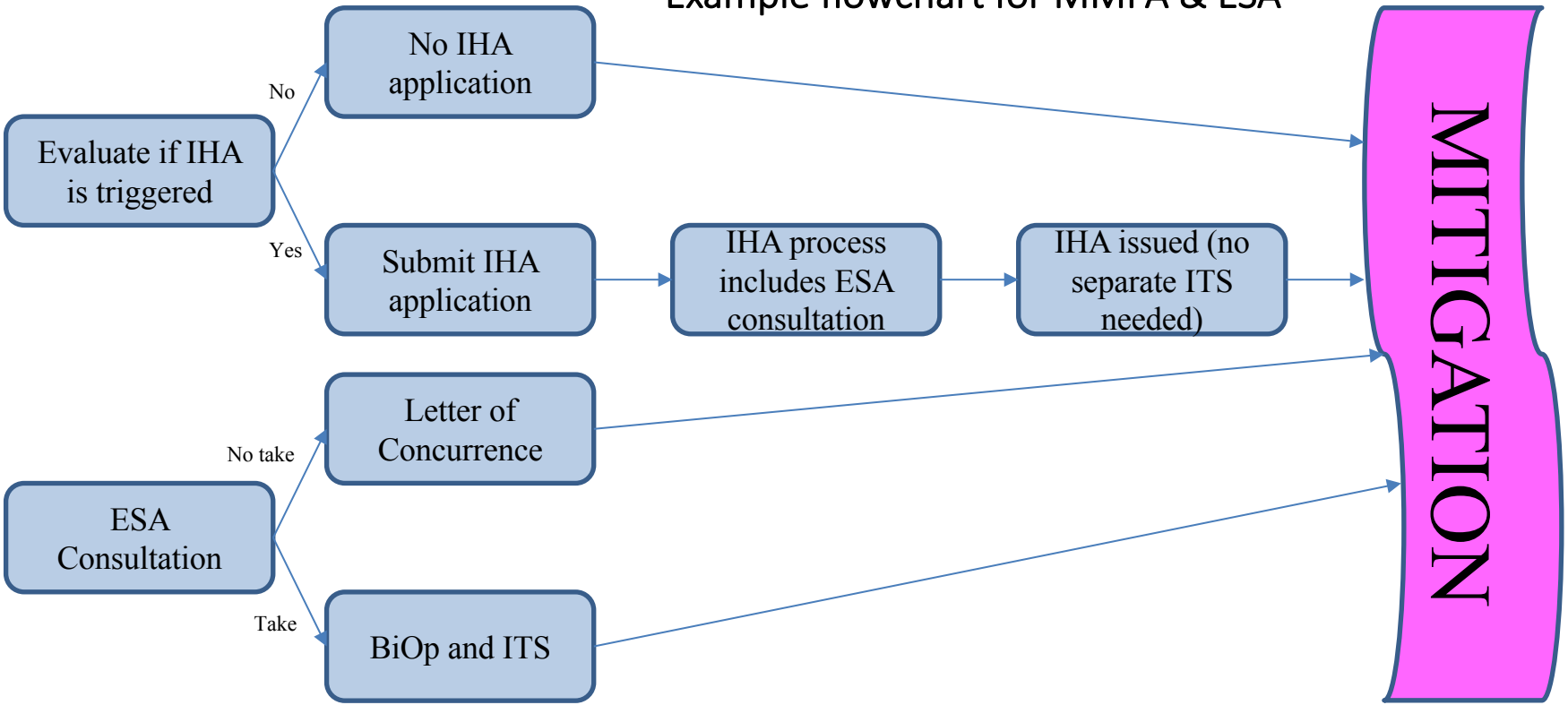
PERMITS & CONSULTATIONS

- MMPA: Incidental Harassment Authorization or Letter of Authorization for marine mammal “take”
- ESA: Incidental Take Permit or Letter of Concurrence
- MSA: Essential Fish Habitat consultation
- MBTA: USFWS is in process of rulemaking to create permit framework
- CZMA: Consistency Certification with states
- NMSA: 304d consultation
- OCSLA: BOEM permits
- NEPA: EA/EIS

- State Waters: State Permits

Photo: Royal Society for the Protection of Birds

Example flowchart for MMPA & ESA



MARINE MAMMAL TAKE ESTIMATION

- Lack of data and/or sightings
- Density not tied to abundance
- Lack of understanding of habitat preferences, movement patterns, stock structure, density, abundance, and distribution
- Uncertainties and probabilities unavailable, unreported, and/or unconsidered

Worst-case scenario models may not allow for necessary findings for permits for large-scale projects

BASELINES

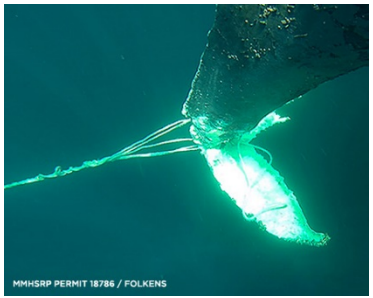
Rendition of windfloat for offshore Portugese wind farm by Energias de Portugal & Principle Power
http://thegreenwombat.com/category/principle-power/

- Pre-development conditions
- Literature review
- Regulatory review
- Public engagement
- Data collection
- Cumulative impacts/Relative impacts
- Small scale demonstration with monitoring
- Adaptation
- EA/EIS

Block Island Wind Farm demonstration
http://dwwind.com/project/block-island-wind-farm/

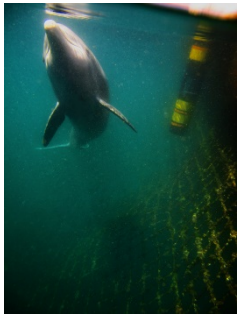
MONITORING

- Pre-siting: Site choice
- Post-siting: Monitoring
  - Seabed (anchors, cables)
  - Pollution/turbidity
  - Physical barrier/collision
  - Line/cable entanglement (tension/diameter)
  - Electromagnetic Fields
  - Noise
- Marine mammals, ESA-listed species, MBTA listed species
- “Unprotected” species & ecosystems
- Costs/Practicality



MONITORING EXAMPLES

- Evaluate sound levels necessary for siting surveys
- Check mooring lines for marine debris, entanglements, tension, deterioration
- Active acoustic monitoring
- Passive acoustic monitoring of marine mammals and ambient noise
- Sample/observe water column for turbidity, pollutants
- Sample/observe benthic habitats
- Sample fish, marine mammal aggregation
- Engage fishers for their observations
- Radar or other technology to monitor birds



MITIGATION EXAMPLES

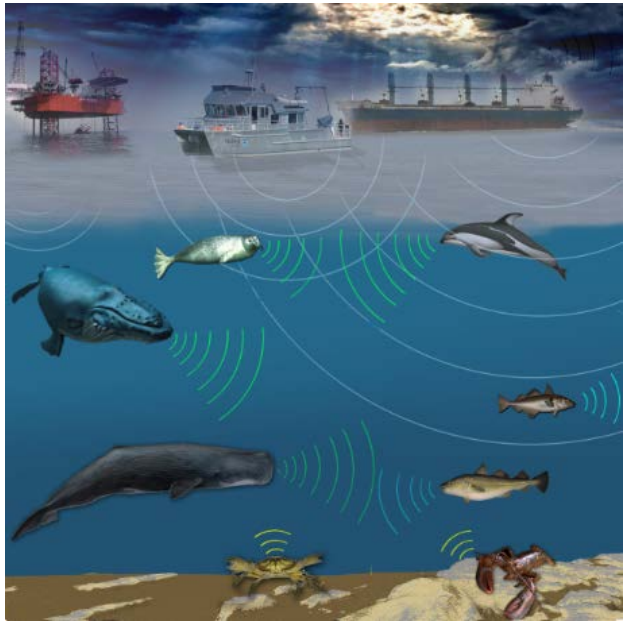
- Use noise sources that can be turned off for siting surveys & installation
- Develop ramp-up and shut-down procedures
- Make duration of the activity as short as possible
- Adjust timing (season/day)
- Minimize sound/use sound reducing technology
- Minimize disturbance (e.g. underground cables)
- Taught mooring lines
- Animal deterrents

Consider biology, regulations, & public sentiment

Bubblenet to reduce sound propagation

SUGGESTED STRATEGIES

- **Talk to agencies & public early**: Each law & office is different—provide as much information as you can up front
- **Reduce risk**: Evaluate how technology can be used to avoid & minimize impacts
- **Be flexible and patient**: Be prepared for project timing to be affected by wildlife seasonality, habitat use, vulnerable species, etc.



Sources contributing to ocean soundscapes
(Figure: Mike Thompson, NOAA/SBNMS)

SUGGESTED STRATEGIES

- **Recognize agencies are undergoing a process too**: They are not experts on offshore wind—share details of technology, sound sources, mitigations—make suggestions
- **Do not rely on inter-office or inter-agency communication**: Talk to offices directly and seek expertise

Do not assume the regulators understand how your equipment works or what logistical constraints you have. Tell them!

* Equations associated with Technical Guidance's weighting ($W(f)$) and exposure functions ($E(f)$):

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{[1+(f/f_1)^2]^a[1+(f/f_2)^2]^b}\right\}$$

$$E(f) = K - 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{\left[1+(f/f_1)^2\right]^a\left[1+(f/f_2)^2\right]^b}\right\}$$

Summary

- Baseline information, demonstration, long-term monitoring
- Changing science & management requires adaptation & flexibility
- Costs/Practicality
- Main concerns of wind float: habitat loss/change, pollution/debris, collision/entanglement, noise
- Engage agencies & public early & often
- Three pillars: Biology, Regulation, & Public Sentiment

GOAL: SUSTAINABLE ENERGY DEVELOPMENT!

FIN

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Photos in presentation from NOAA websites unless otherwise noted.