Guidance for Detecting Changes in Seabird Distributions and Habitat Use Related to Offshore Wind Energy Development in the U.S.

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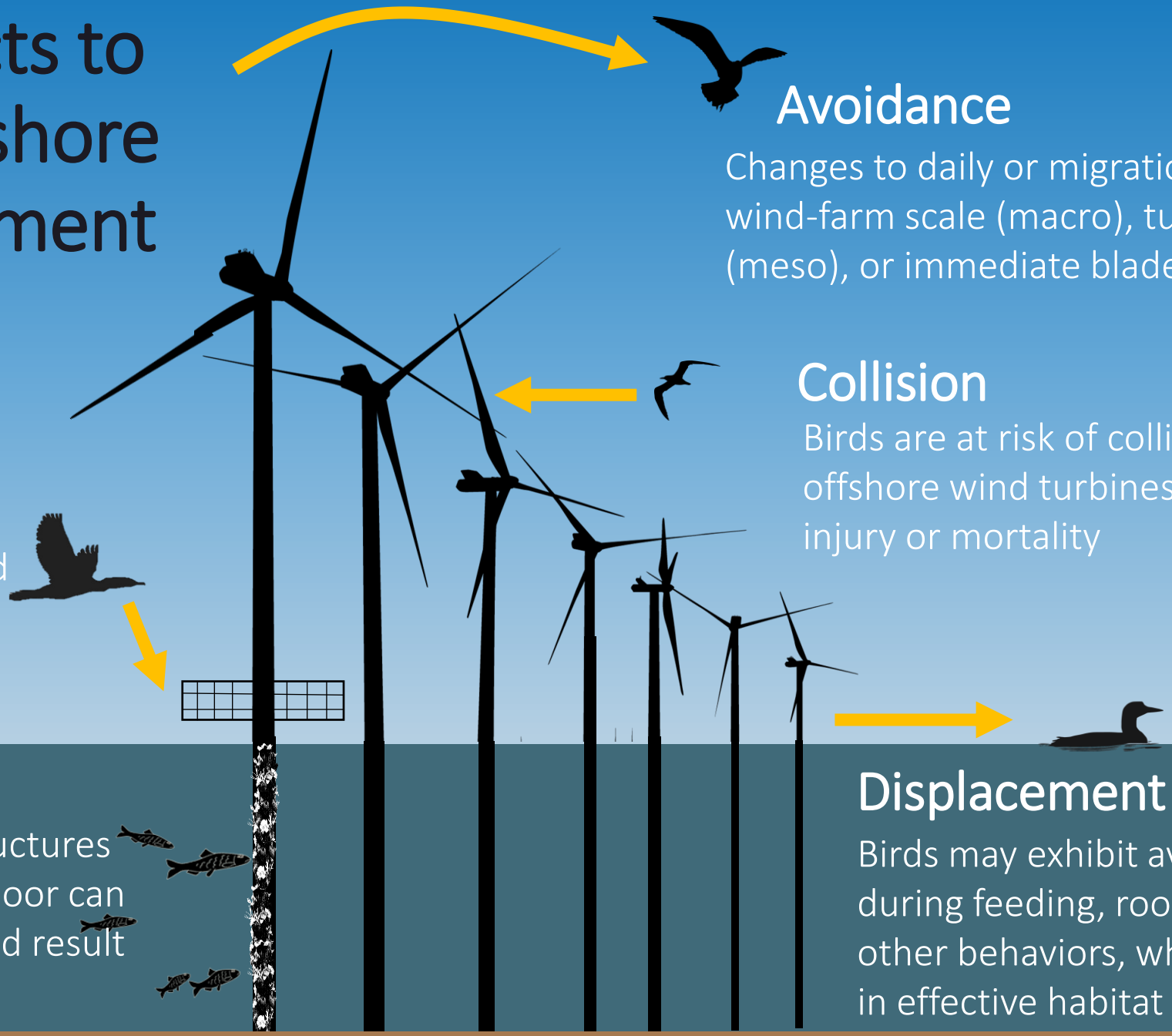
Potential Effects to Birds from Offshore Wind Development



Avoidance

Changes to daily or migration movements at wind-farm scale (macro), turbine-scale (meso), or immediate blade-scale (micro)

Collision

Birds are at risk of colliding with offshore wind turbines resulting in injury or mortality

Attraction

Species may be attracted to wind farms due to increased foraging or perching opportunities

Habitat Change

The introduction of hard structures and disturbance to the sea floor can alter ecosystem structure and result in changes in resources.

Displacement

Birds may exhibit avoidance during feeding, roosting, or other behaviors, which results in effective habitat loss

U.S Offshore Wind

- Key component of state and federal plans to minimize climate change
- Target of >39 GW by 2040
- 10 lease sales and 27 active commercial wind leases
- Developers planning on 10.3 GW by 2026
- Two commercial-scale projects currently under construction – first power to the grid in Dec. 2023

New York has been working with stakeholders since 2017 to ensure environmentally responsible offshore wind development

Avian Displacement Guidance Committee

Co-chaired by BOEM and USFWS and made up of subject matter experts

Goals: Inform pre- and post-construction monitoring and research approaches for detecting and characterizing displacement, attraction, and macro- to meso-avoidance of marine birds at OSW facilities in U.S. waters

Use of guidance:

- Supplement existing BOEM guidance for site characterization at OSW farms
- Referenced and/or incorporated into future national OSW-wildlife guidance developed by regulatory agencies
- Used by OSW developers for site-specific monitoring plans

NEW YORK STATE OF OPPORTUNITY. NYSERDA

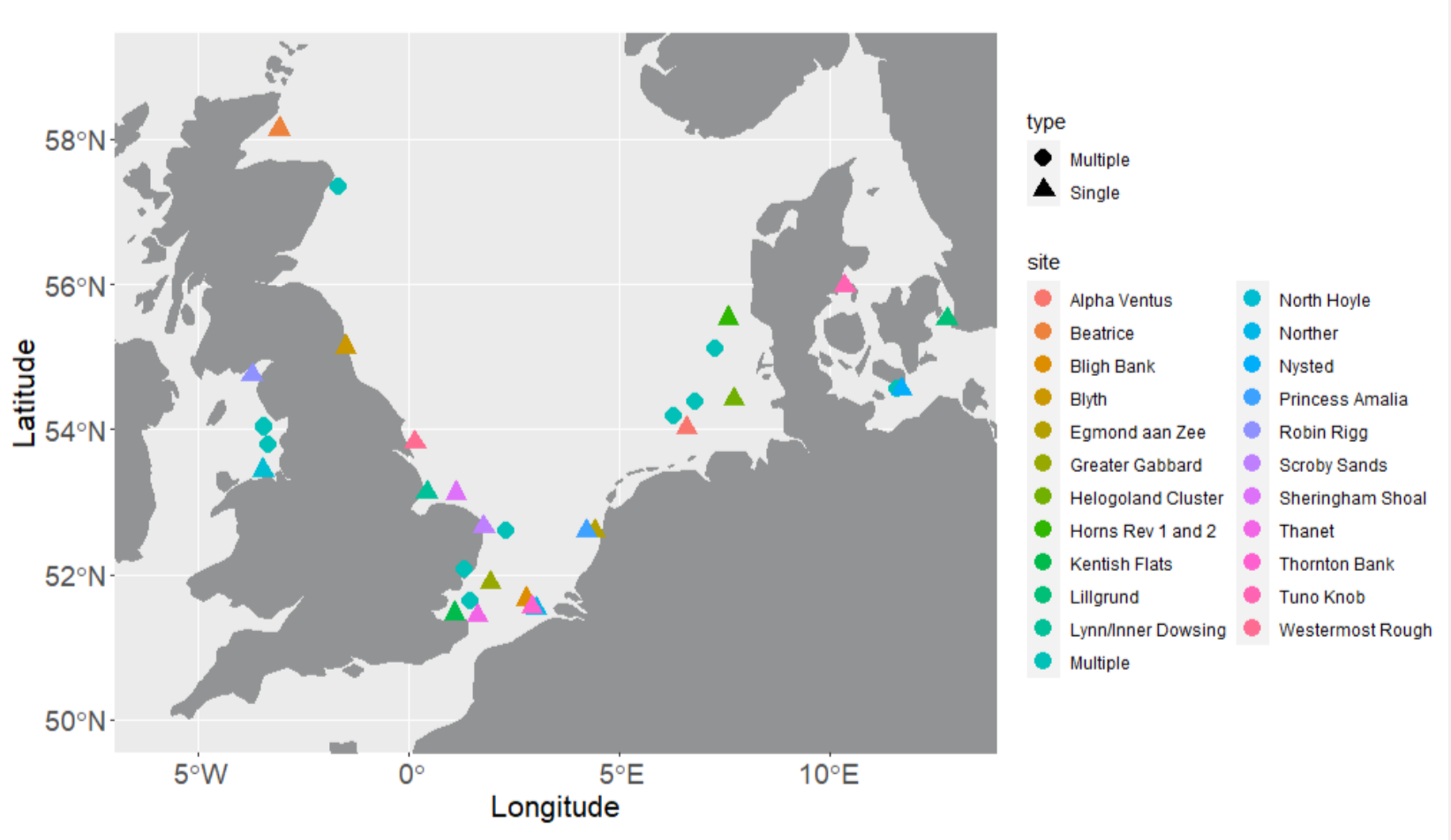
bri BIODIVERSITY RESEARCH INSTITUTE innovative wildlife science

U.S. FISH & WILDLIFE SERVICE

BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

Literature Review to Inform Recommendations

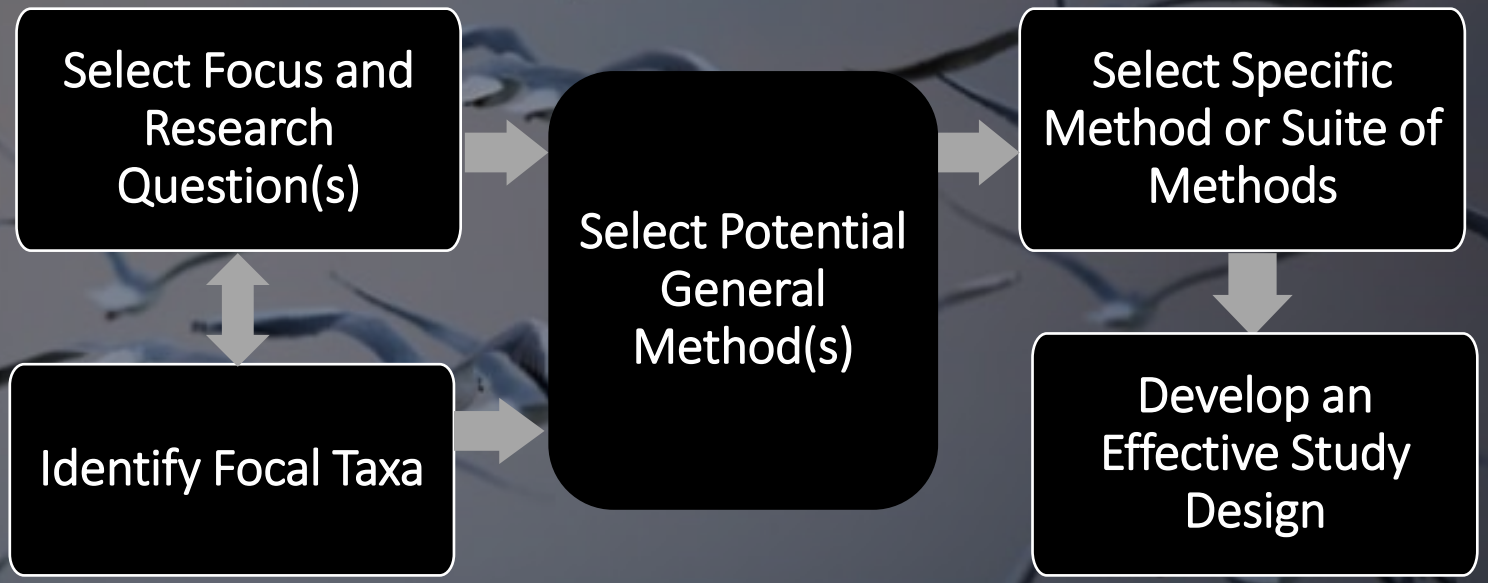
- Levels of displacement and avoidance for Europe
- Potential sources of variation in response
- Aspects of study design that may influence statistical power



Lamb et al. *In Review*

Guidance for Pre- and Post-Construction Monitoring to Detect Changes in Marine Bird Distributions and Habitat Use Related to Offshore Wind Development

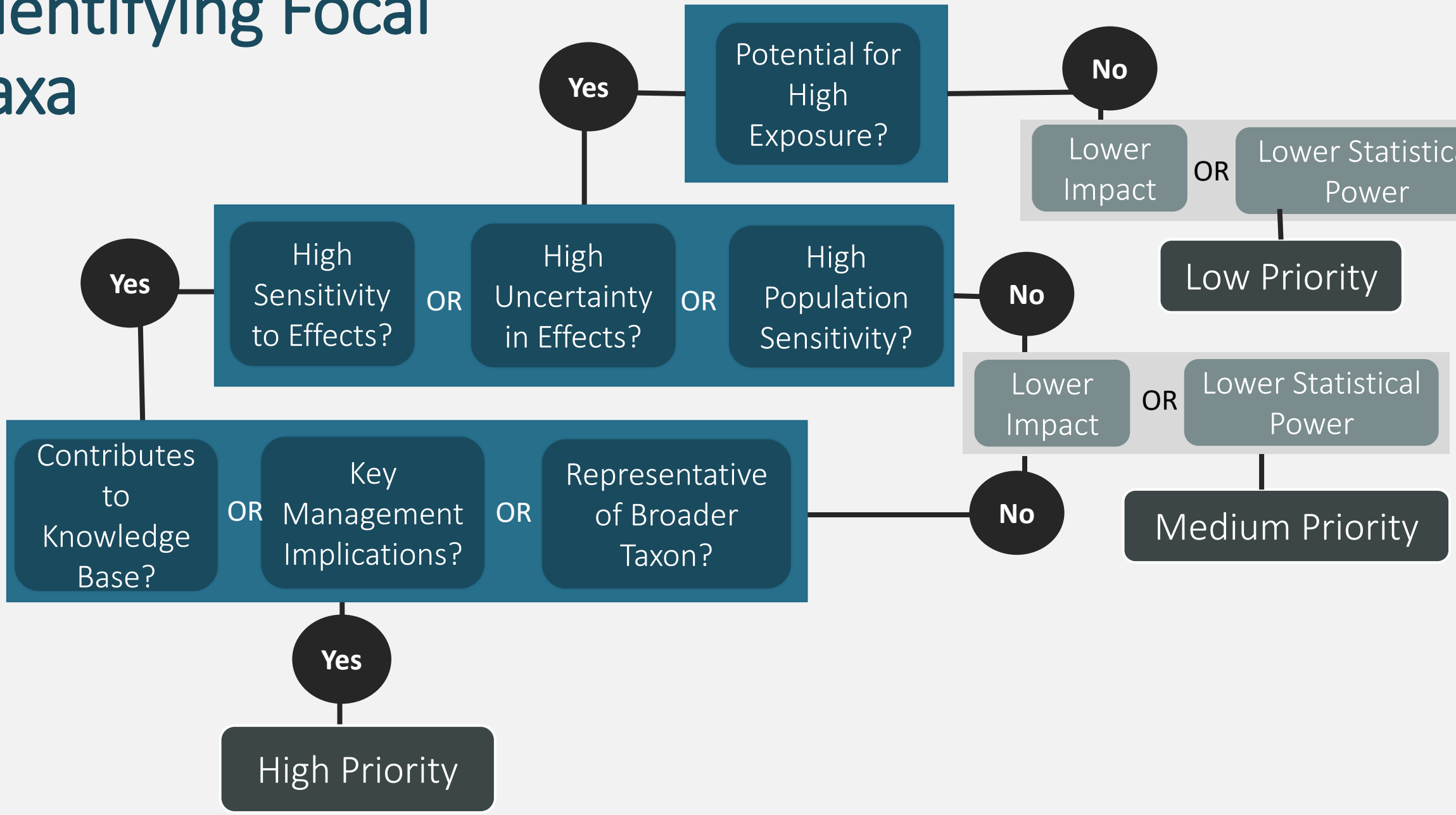
- Part I: Summary
- Part II: Introduction
- Part III: General Study Design Recommendations
- Part IV: Recommendations for Observational Surveys
- Part V: Recommendations for Future Guidance and Research



Addressing Key Research Questions

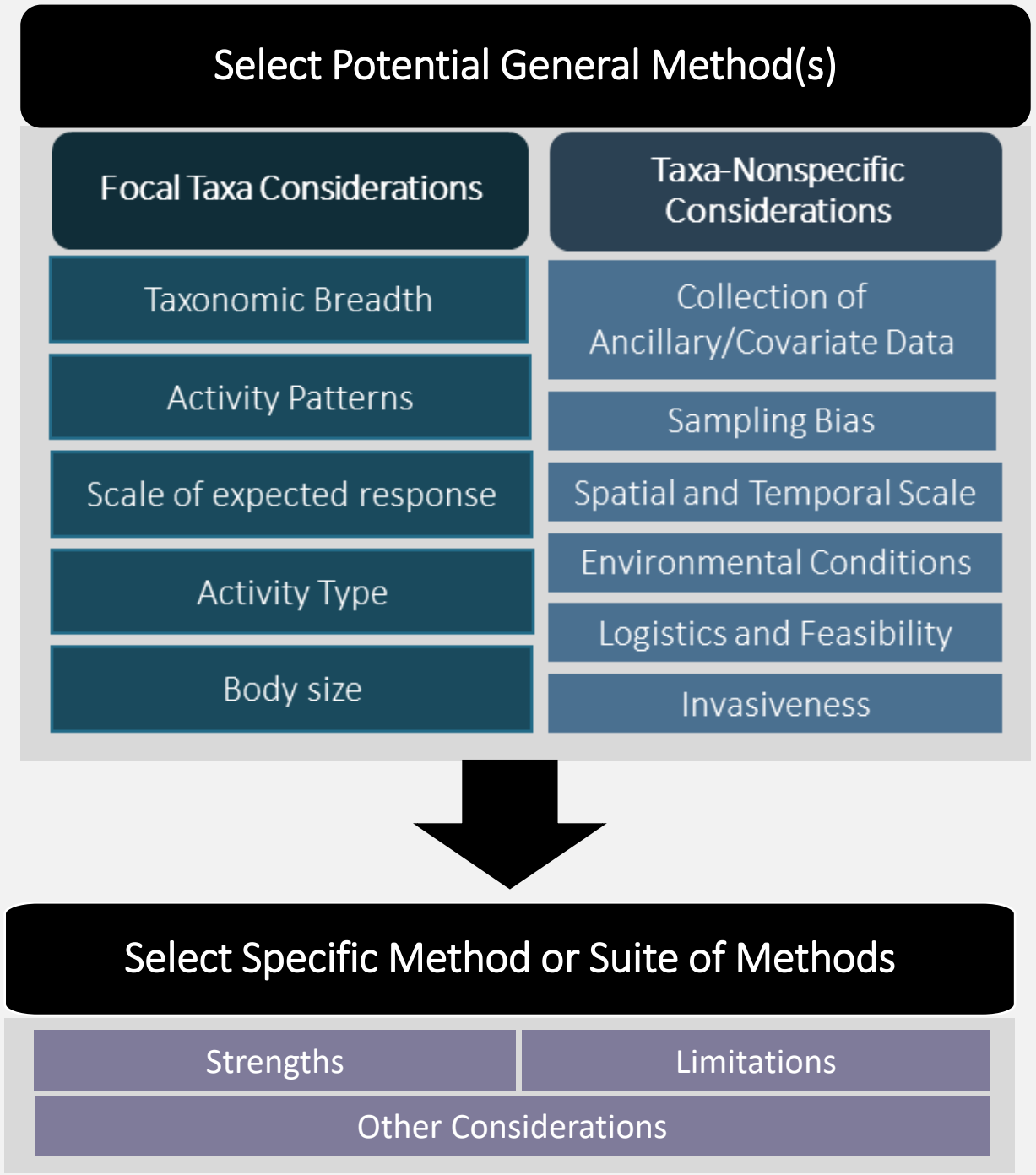
Research Question	Project Phase
Are **changes in distributions and habitat use** (e.g., displacement/attraction) of marine birds occurring, and if so, what is the magnitude and distance from the offshore wind facility at which they occur?	Pre-construction, Operations
Do the **occurrence, magnitude, and distance of changes in habitat use vary temporally** (e.g., does habituation occur)?	Pre-construction, Construction, Operations
Are there **changes in foraging or roosting activities** of marine birds in relation to the wind facility?	Pre-construction, Operations
Is there **nocturnal attraction** of marine birds to offshore wind-related lighting?	Pre-construction, Construction, Operations
Are **macro-scale changes in movement behavior** of marine birds occurring, and if so, at what magnitude and distance from the offshore wind facility does this behavior extend?	Pre-construction, Operations
Are **meso-scale changes in movement behavior** of marine birds occurring, and if so, at what magnitude and distance from the turbines does this behavior extend?	Operations

Identifying Focal Taxa



Choosing Appropriate Methodologies

- **Observational Surveys**
  - Digital aerial, boat-based
  - *Not recommended: visual aerial*
- **Individual Tracking**
  - GPS, satellite telemetry, automated radio telemetry
    Not recommended: geolocators
- **Remote and Behavioral Observations**
  - Human observers, visual photo/video, thermal photo/video, satellite imagery
  - *Not recommended: passive acoustics*
- **Radar**
  - Marine, 3D, weather surveillance



Developing an Effective Study Design

- **Study design** – evaluate if data types and sample sizes are sufficient to detect effects and ensure that data collection addressed research questions
  - Choice of focal species
  - Sources of variation
  - Spatial and temporal scale

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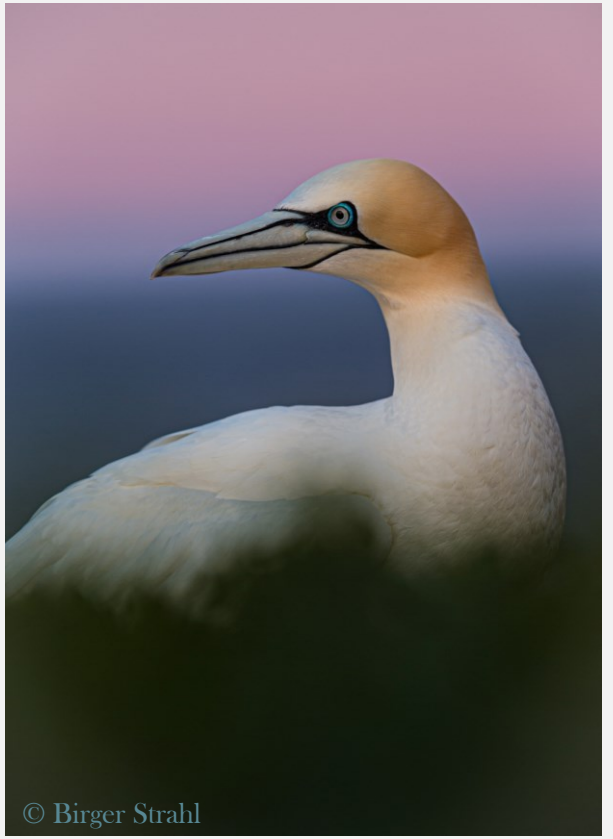
- **Data analysis** –biases, modeling framework, autocorrelation, model complexity, covariates, model performance

Data Consistency and Transparency

- **Communication and coordination** across groups conducting similar research
- **Standardized reporting** including study design, results, sources of variation
- **Public availability** of data
- Contributing **derived products** to data portals
- **Publishing** study results
- Implementing formal **data sharing** agreements

Recommendations for Conducting Surveys to Detect Effects

- Study design
  - Before-after-gradient (BAG) study design
  - Power analysis of existing data to inform design
  - Coordination of adjacent lease areas



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- Study design
  - Before-after-gradient (BAG) study design
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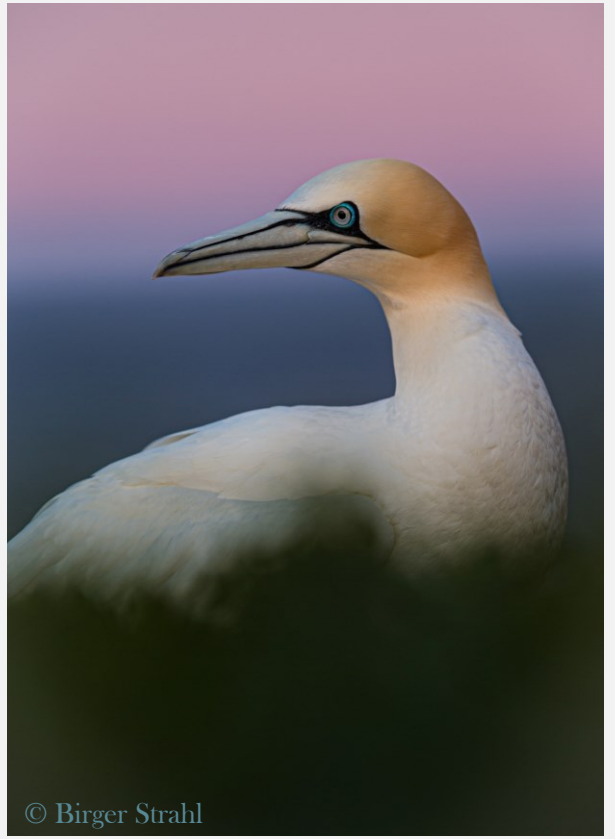
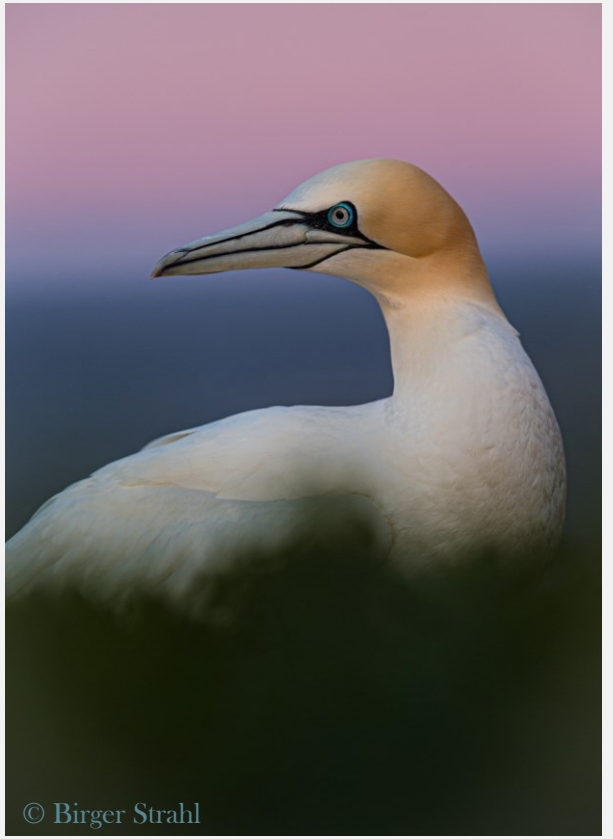
  - Coordination of adjacent lease areas
- Spatial and temporal scale
  - 4-20 km buffer
  - 20% spatial coverage
  - Number of surveys per year and across years
  - ≥12 surveys/year, distributed across seasons of interest
  - 2 years pre-construction and 3 years post-construction
  - ≤5-year gap pre-post



Recommendations for Conducting Surveys to Detect Effects

- Data Collection
  - Platform speed and height
  - Surveyor qualifications and training – at least 50-100 hrs of training, demonstrated ability
  - Conditions - sea state of Beaufort 4 or less; Survey angle and location should be designed to minimize glare
  - Standardized data collection, including effort data and covariates



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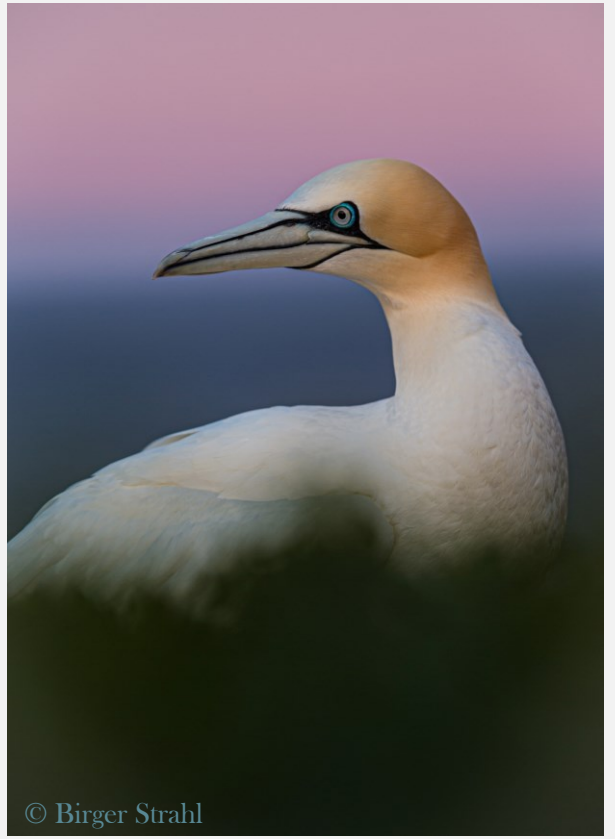
  - Standardized data collection, including effort data and covariates
- Data Review and Reporting
  - QA/QC
  - Standardized reporting of methods, spatial/temporal coverage, density estimates & variance by taxon, site characteristics
  - Public availability of data within 2 years; include effort and covariate data, metadata, reports, analytical code



Recommendations for Future Guidance and Research

Next Steps for Guidance

- Work to ensure that federal agencies and offshore wind developers use guidelines
- Support additional analysis to address unresolved study design questions
- Develop detailed recommendations for non-survey methods (e.g., tracking)
- Develop standing working group to provide study design guidance and review study plans

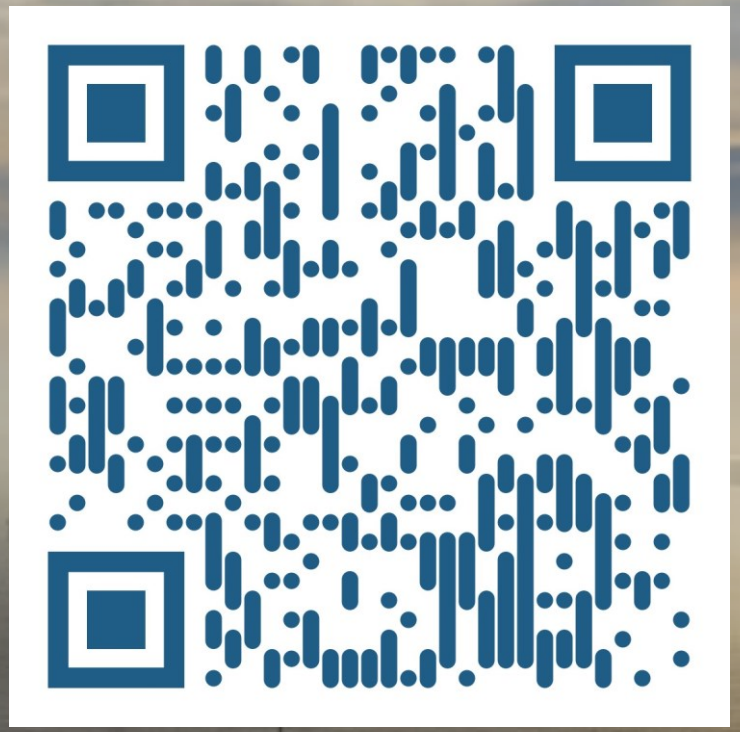
Other Guidance, Frameworks, and Research Needs

- Develop approaches for conducting efforts at multi-project scales
- Develop standardized approaches for conducting power analyses and approaches to inform study design
- Formulate recommendations for studies of other types of OSW effects to marine birds
- Develop species distribution modeling frameworks to integrate data across sources
- Conduct studies to better understand the mechanisms of behavioral change, as well as the potential for population-level impacts from avoidance, attraction, and displacement

Next Steps

- Draft guidance available on website
- Finalization of the guidance by end of February
- Sign up for the E-TWG mailing list for a notification of when the final document is publicly available

http://nyetwg.com/avian-displacement-guidance



Thanks!

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