Good Practice Handbook on the Design of Post-Construction Monitoring of Bird and Bat Fatalities at Onshore Wind Energy Facilities

Presentation to UN CMS Energy Task Force (ETF)

1st December 2020

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Agenda

- Context and objectives of the Good Practice Handbook (GPH)
- Lenders context
- Outline and overview of the content included in the GPH
- Exploring the Decision Support Tool (DST)
- Questions

Context

- Impacts of onshore wind projects on bird and bat populations are well documented in certain developed economies, but *robust* data is lacking in many countries and the knowledge gap between some established markets and emerging RE markets is growing
- This is a function of: a) a lack of systematic monitoring, b) poor methodologies being used, c) no monitoring being undertaken
- Without robust and systematic monitoring:
  - Actual impacts on birds and bats will remain largely unknown in emerging markets
  - Impacts will be estimated using surrogates (often from temperate conditions and wildlife populations with differing characteristics)
- PCFM is the best means:
  - To assess whether predicted impacts on birds and bats (from collision risk models or using risk assessment approaches) were estimated correctly
  - To test the effectiveness of mitigation measures and inform adaptive management
- Key stakeholders including the ETF have identified the importance and need for increasing the systematic monitoring of bird and bat fatalities at operating onshore wind farms

Purpose and objectives of the Good Practice Handbook

- The GPH will outline the design considerations of post-construction fatality monitoring (PCFM) of bird and bat collision fatalities at onshore wind projects and provide a tool to help users determine an effective PCFM study design for their site
  - It will be contextualised for emerging markets
  - The main users are intended to be the consultants working for developers
- Principal objectives:
  - Develop a practical, fit-for-purpose methodology on PCFM to select the field methods to collect standardized data on bird and bat fatalities so that accurate fatality rate estimations could be made.
  - The methodology should be one that could be implemented anywhere despite the location of the WEF, its ground conditions and the bird and bat populations present
  - The methodology should not be overly prescriptive or onerous in markets with lower capacity. It should also allow for adaptations given the potential unique constraints of emerging market countries.
  - To ensure that the GPH has broad buy-in from a group of relevant stakeholders

Introductions –Steering Committee

- Robert Adamczyk, EBRD
- Lori Anna Conzo, IFC
- Daniel Skambracks, KFW

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Introductions – Technical Team

- Paul Rabie and Todd Mabee, WEST Inc.
- David Tidhar, Natural Power

Lender finance – why does it matter?

All Project need to secure financing, this will often include combination of debt and equity. This applies for both public and well as private sector Projects.

Sources of financing can be:

- Multilateral Development Banks (MDBs) – EBRD/IFC/World Bank/EIB/AIIB etc.
- National development Agencies or State Development Banks (kfw, DEG, JBIC, US OPIC etc)
- Private sector banks
- Investors and private equity, etc.

Most financial investors will apply environmental and social standards and safeguards, MDBs and Development Banks will finance projects in the form of long-term loans at market rates, very-long-term loans below market rates, and through concessional grants.

- IFC Performance Standard (PS) commonly used (EBRD Performance Requirements (PRs) – akin to IFC but EU focused). Many commercial Bank's have signed up to Equator Principles.
- Investors are developing Green Financing tools and reporting and disclosing Environmental and Social Governance (ESG) information

Overall increasing pressure on disclosure and reporting and investors will shy away from risky project or project that can have a negative impact on reputation etc.

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Lender approach

- We finance Project developed by Sponsors (Clients), often permitted and sometimes providing finance to existing Clients (i.e. for existing portfolio).
- For each Project we undertake an Environmental and Social Due Diligence to ascertain compliance with National law and our PR/PS.
- Projects are screened based on sensitivity and risk
- As part of agreement, an Action Plan (ESAP for EBRD) is agreed with client and part of financing agreement.
- All Project should have a monitoring program in place.

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What we want to achieve

- Sustainability and biodiversity is at the core of our mandates and we aim to make a positive change.
- The financial sector's role in facilitating others to affect biodiversity and ecosystems is increasingly being recognized.
  - Climate changes and biodiversity as well as Social issues are shaping how financial sector thinks
  - Reputation risks and liabilities from association with bad practice are especially well known in project finance.
  - Reputational and political drivers
  - ESG and disclosure and reporting requirements are becoming standard
- Biodiversity can be an opportunity for business and sustainable growth and employment
- We are supporting business for Biodiversity
- Financial Institutions will only invest in the best projects
  - Environmental standing often reflects overall performance
  - Developers needs to demonstrate they comply with Good International Industry Practice (GIIP) and compliance with National legislation and MBD requirements.

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Draft organisation of the GPH

- Chapter 1: Impacts to wildlife from renewable energy and the objectives of PCFM
  - Provide context, but focus on collision-related impacts
- Chapter 2: How to use the GPH and what a reader can expect to get from it
  - The motivation for the GPH is to provide a resource that can guide a practitioner to a good study design for PCFM, but that also teaches practitioners how to think through the design and execution of PCFM studies
- Chapter 3: Designing your PCFM Study
  - The objective of this chapter is to describe the main principles of a PCFM design in a manner that both new and experienced practitioners will gain insight on study design
- Chapter 4: Preparation for field work
  - This chapter will emphasize that how you collect data in the field will directly influence your ability to use fatality estimation software. Importance of collecting data in a manner that is compatible for analysis in GenEst
- Chapter 5: Fatality Estimation
  - Explain high level concepts of fatality estimation, discuss use of GenEst and Evidence of Absence

Draft organisation of the GPH

- Annex 1: PCFM Decision Support Tool (DST) for Study Design
  - Guides users to an appropriate PCFM study design based on study objectives and site characteristics
- Annex 2. Glossary of technical terms from the text and DST
- Annex 3. Reference manual for the GenEst software
- Format TBD: Practical constraints and practical alternatives
  - Discussion of options to adjust PCFM designs to accommodate practical constraints, and how such modifications may impact on the accuracy and precision of the resulting fatality estimates
  - Many design modifications become possible if practitioners are willing to make assumptions–discuss the appropriateness of replacing data with assumptions, the potential consequences of such assumptions and importantly, how to evaluate the consequences of such assumptions

Chapter 3: Designing your PCFM Study

Increasing technical understanding and context for the user

- What is the overarching goal of PCFM?
- PCFM field activities and their components
- How to start thinking about PCFM design
- Comparing PCFM study designs
- Reviewing components of the PCFM study design
- E.g. Fatality search survey design
  - Turbine sample
  - Search plot shape and size

Assembling the components into a design

Detection probability and precision measures to determine the most appropriate design

The Decision Support Tool

- The DST. What does it do? How can it help find the most appropriate design for a PCFM study?

Decision Support Tool (DST) for Study Design

- Excel spreadsheet format
  - Widely accessible software
  - Likely a durable technology
- Provide a feasible monitoring design
  - Good International Industry Practice (GIIP), not “top of the line”
- Based on site characteristics
- Intended to be useful to post-construction fatality monitoring neophytes
- Assumes all size classes (bats through large raptors) are at risk unless local data show otherwise
- One design per season
- Design features based on most difficult carcasses to detect (e.g. bat vs. large bird)

What is the DST doing for someone designing a PCFM?

- Optimize the detection probability for target organisms
- Control costs
- Ensure that data meet a standard and quality to be suitable in future meta-analyses

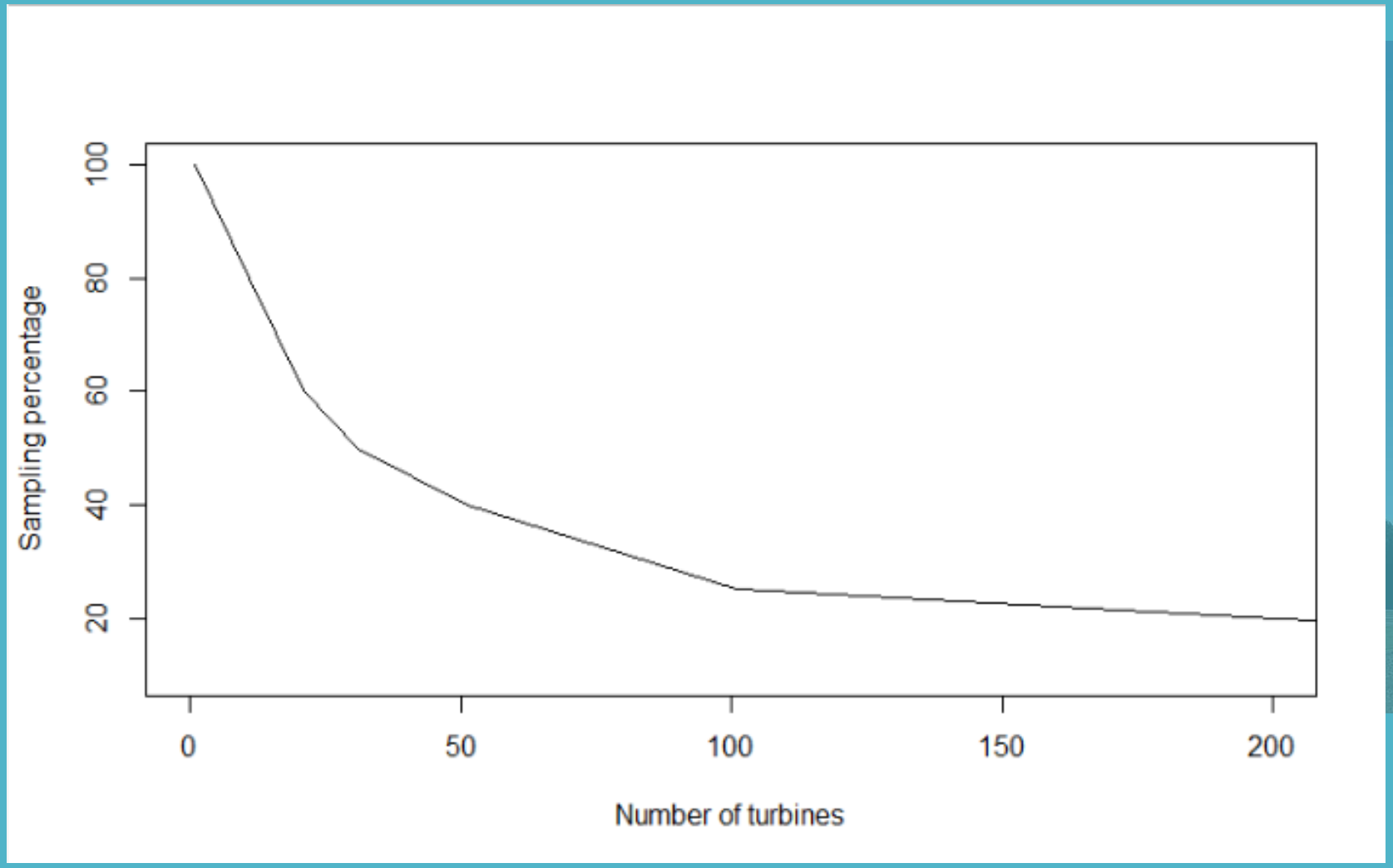
Information from the user to help optimise their study design?

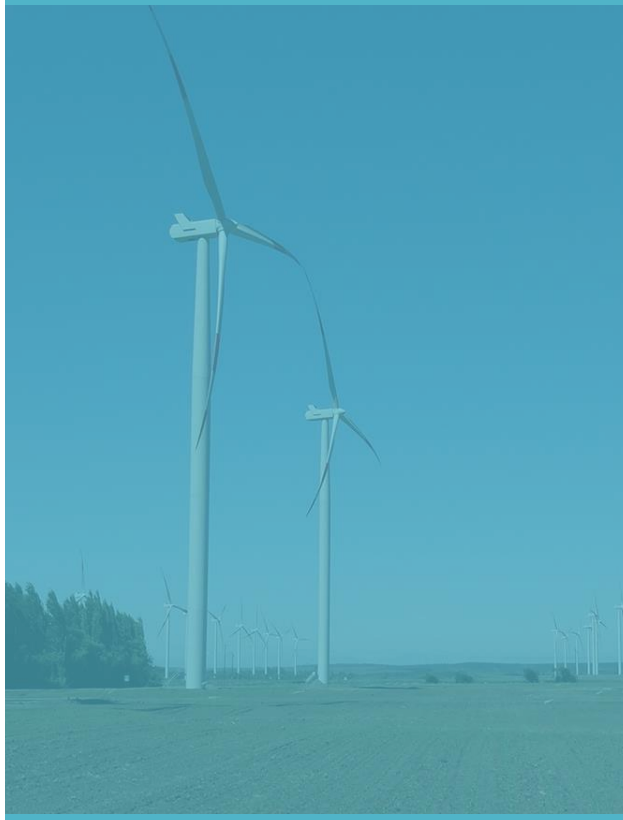
Inputs
How many turbines are at the facility?
What is the hub height of the turbines?
What is the blade length of the turbines?
How large are the turbine pads?
How wide are the access roads?
What is the evidence of large birds/medium/small birds and bats colliding with wind turbines as demonstrated by recent and robust fatality data in the project area or in its immediate vicinity?
Is it legal to access areas not on the road & pad?
What is the minimum vegetation height in areas off the roads and pads?
What is the maximum vegetation height in areas off the roads and pads?
How difficult is it to walk transects off the road / pad?
Is it safe to search off the road and pad?
Based on local data, what is the median removal time (days) of a large/medium/small bird and bat?

How does a user synthesize that information when designing their PCFM program?

		Smaller organisms (e.g. bats)	Larger organisms (e.g. vultures)
Source of bias	Searcher efficiency	Tends to be lower	Tends to be higher
Component Design	Transect spacing	Closer (no more than 6 m spacing)	Can be farther apart (10 m or more)
Source of bias	Carcass Persistence	Tends to be shorter	Tends to be longer, greatly so for large raptors
Component Design	Search frequency	More frequent	Can be less frequent
Source of bias	Fall distribution	Tends to fall closer, max distance closer to turbine base	More variable fall distances, can fall farther from turbine base
Component Design	Plot extent	Can be small radius/plot extent; road and pad surveys more viable	Larger radius/plot extent; road and pad surveys less viable; scan searches may be ideal

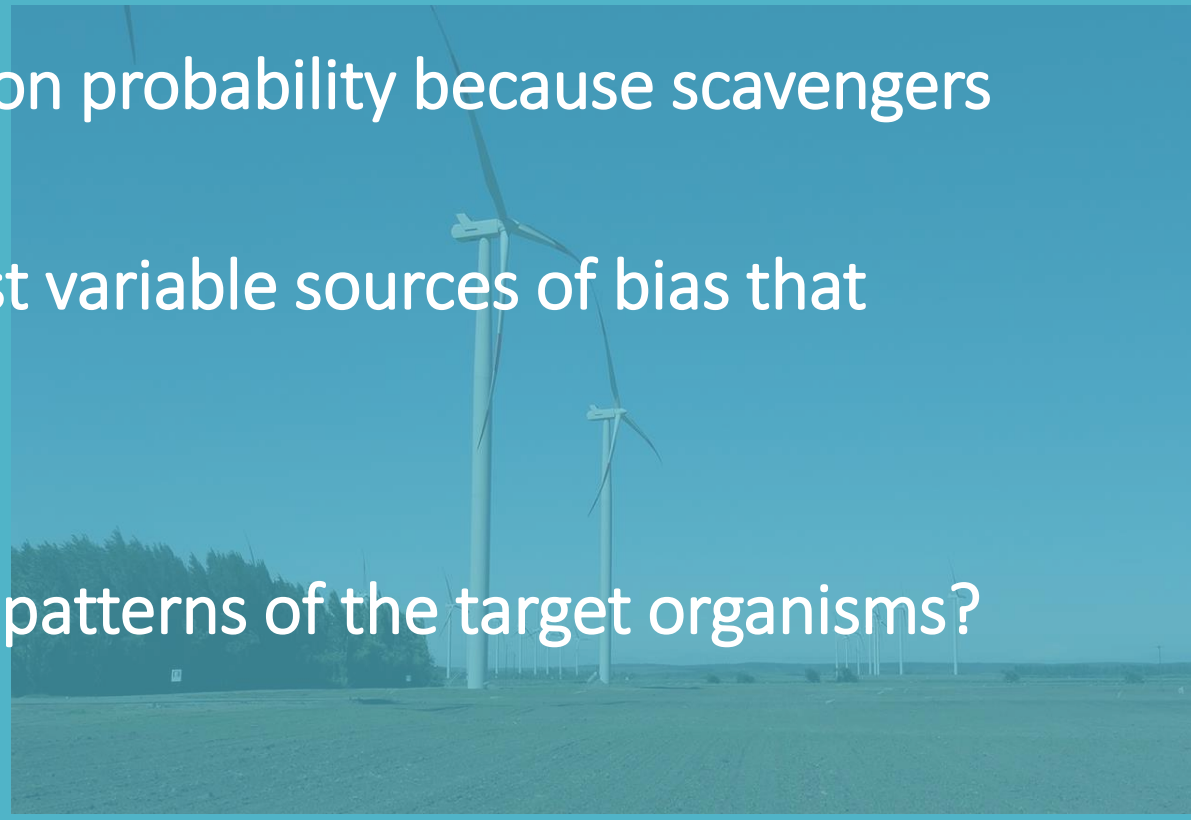
How does the DST help users design their PCFM – determining how many turbines to include?



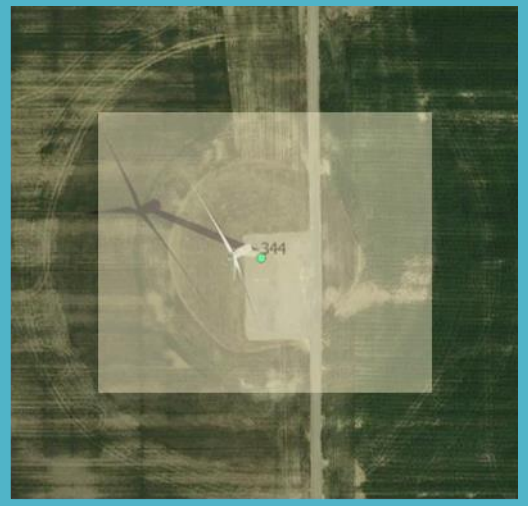


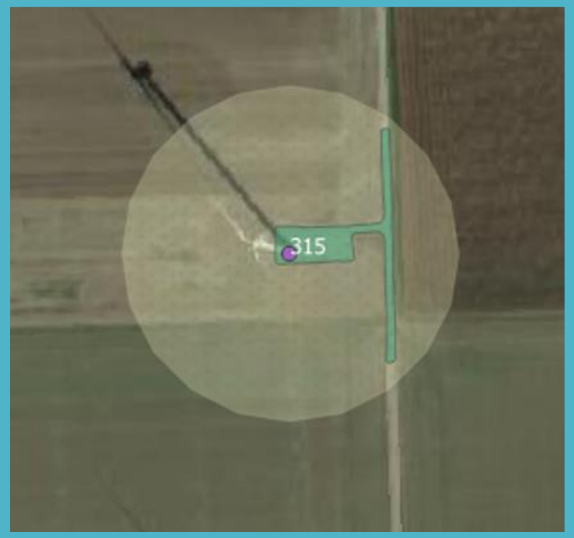
How does the DST help users design their PCFM – determining how frequently carcass searches should be conducted?

- Search frequency impacts detection probability because scavengers may remove carcasses
- Carcass removal is one of the most variable sources of bias that influence carcass counts
- Do we have recent, local data?
- What do we know about removal patterns of the target organisms?



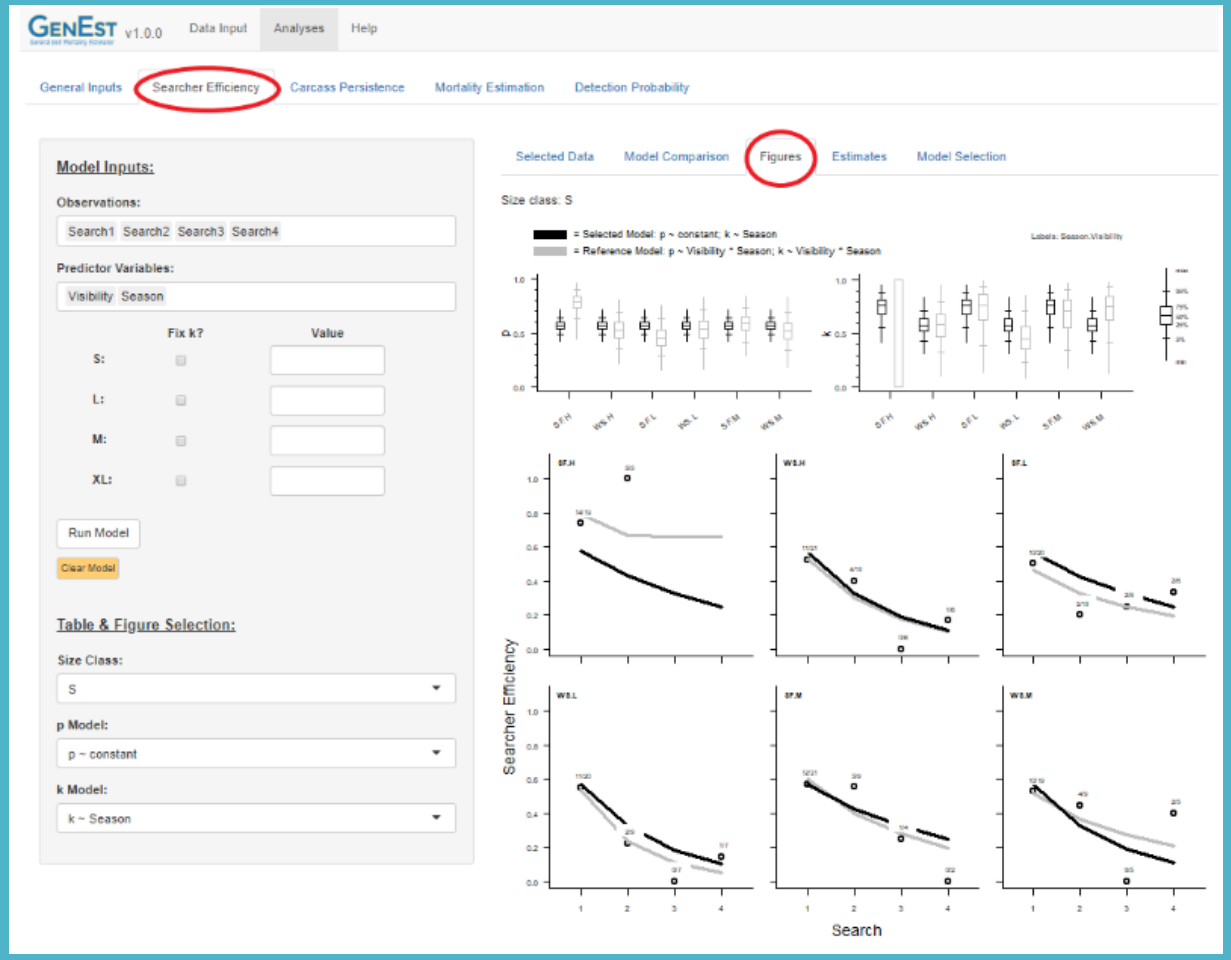
What are the kinds of study designs that the DST recommends?



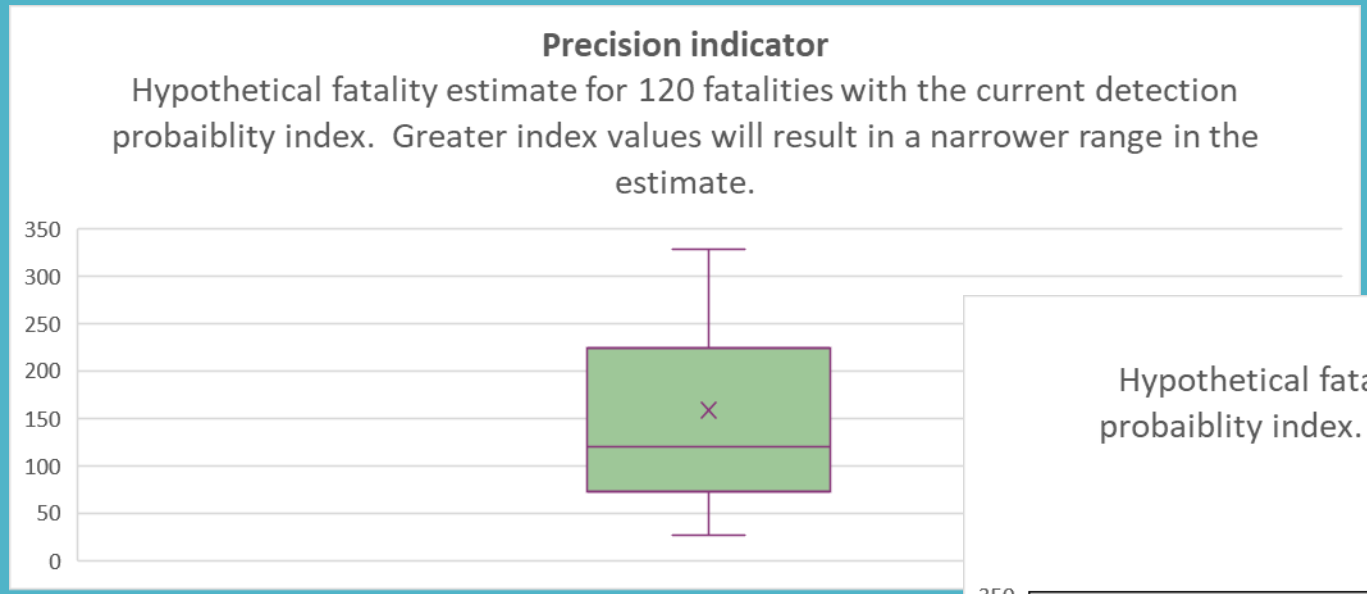


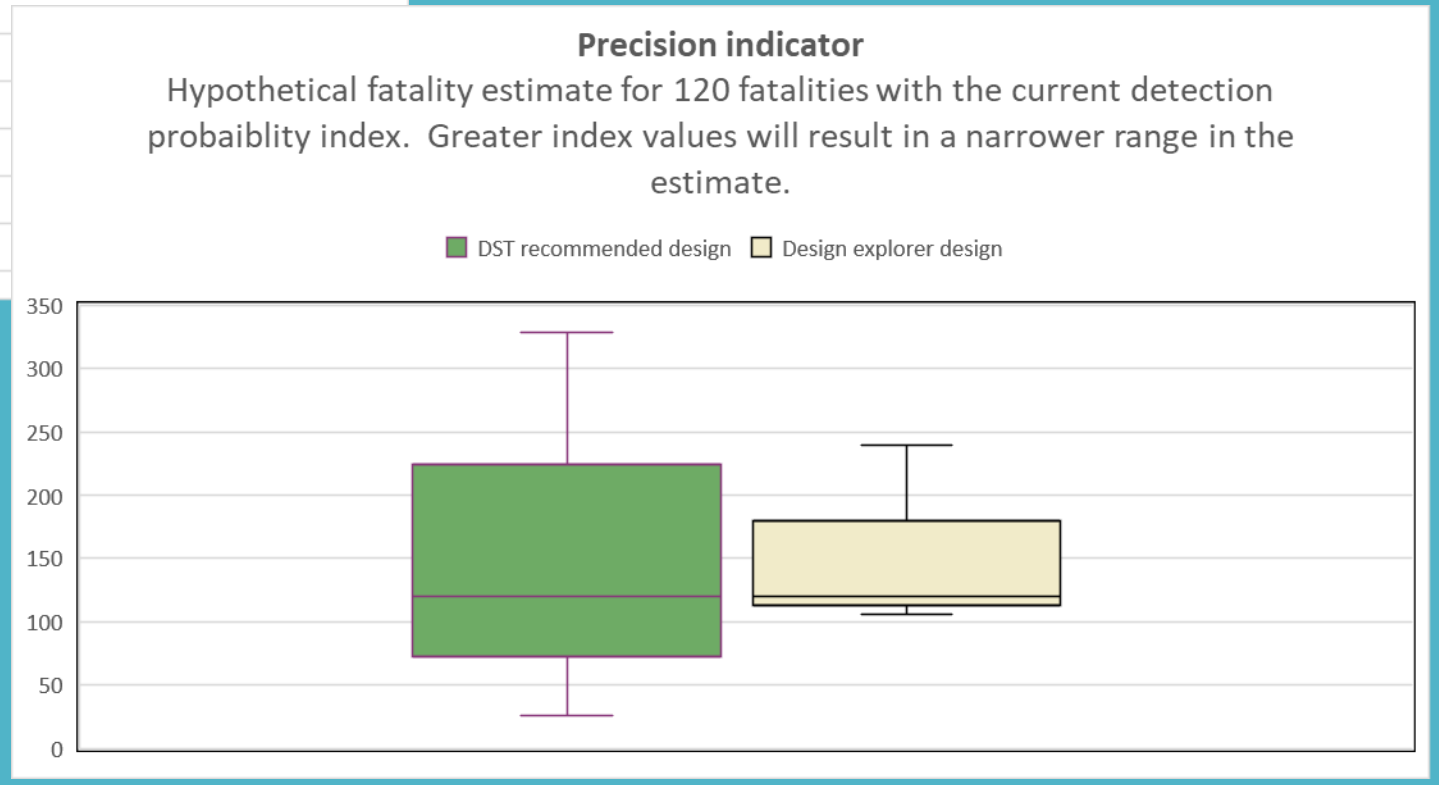
Why does the GPH identify GenEst as the best tool for statistical estimation of bird and bat fatality rates?

- Best fatality estimator available
- Most accessible estimator available
- Promotes collection of data with standardized format



How does the DST help the user assess whether their design will be sufficiently precise?





Provide a feasible monitoring design

GIIP, not “top of the line”

Thank you for your time…any questions?

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