



Report 2023

# Task 34

Porpoises swimming at the ocean's surface. Source: GettyImages-14244264493\_Porpoise.

## Working Together to Resolve the Environmental Effects of Wind Energy (WREN)

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**Reducing the impact of wind energy development on wildlife requires scientifically robust, cost-effective solutions to inform sustainable decisions throughout the lifecycle of a wind energy project.**

Many species affected by wind energy development cross jurisdictional boundaries, which highlights the need for international collaboration. The mission of Task 34 (WREN) is to facilitate international cooperation to create awareness surrounding the environmental effects of land-based and offshore wind energy development. Additionally, to create a shared

knowledge base of recommended practices for monitoring and mitigation strategies that meet conservation and wind power generation goals.

In 2023, WREN drafted two research briefs and translated three previous research briefs into Spanish. The Task also hosted three public

webinars, including its first Spanish webinar, which focused on bat and wind energy interactions in Latin America. At the International Conference on Wind Energy and Wildlife Impacts, WREN hosted a workshop focused on addressing uncertainty in decision-making. WREN furthermore continued to add new entries to the online Wind Energy Monitoring and Mitigation Technologies Tool. There are now 81 technologies included in the Tool. WREN also supports the management of the [Tethys website](#). In 2023, Tethys had 240,000 users, 540,000 pageviews, and contained over 6,500 wind energy and environmental documents

## Introduction

The environmental impacts associated with commercial land-based and offshore wind energy can slow deployment by delaying construction

or curtailing operations. In response to these ongoing concerns, WREN serves as an international forum providing relevant scientific information for government agencies, private industry, conservation organisations, and academia to inform siting and operational decisions. To accomplish this, WREN conducts engagement and outreach activities to key stakeholder groups and develops state-of-the-science materials, including webinars, research briefs, and publications. Specifically, WREN's goals are to:

1. Identify key stressors (e.g., noise or collision) and receptors (e.g., marine mammals or birds), relevant methodologies and technologies used in species impact assessment studies, and recommended practices.
2. Collect and analyse data for high-priority issues, and coordinate among international collaborators to disseminate information

to critical stakeholders across sectors.

3. Ensure the global community has access to the latest information on the research and development status of existing monitoring and mitigation technologies.

## Progress and Achievements

WREN produced two research briefs. The first brief [1] highlighted the findings of an expert forum hosted by WREN in 2022. The forum convened nine subject matter experts to discuss the benefits and limitations of technologies such as radar, cameras, and GPS tags. These technologies are used to monitor raptor interactions with wind turbines and make operational decisions to reduce collision risk. The second brief [2] focused on the mitigation hierarchy, which is a widely used framework to inform conservation decisions (Figure 1).

**Table 1. Countries Participating in Task [13].**

COUNTRY/SPONSOR	INSTITUTION(S)
Belgium	Royal Belgian Institute of Natural Sciences
Canada	Environment and Climate Change Canada
France	France Energies Marines
Ireland	MKO Ireland
Italy	Italian National Agency for New Technologies, Energy and Sustainable Economic Development
The Netherlands	Rijkswaterstaat
Norway	Norwegian Institute for Nature Research
Portugal	STRIX; Bioinsight
Spain	Spanish Council for Scientific Research
Sweden	Vindval; Swedish Energy Agency
Switzerland	Nateco AG
United Kingdom	Marine Scotland Science
United States	U.S. Department of Energy; Pacific Northwest National Laboratory; National Renewable Energy Laboratory

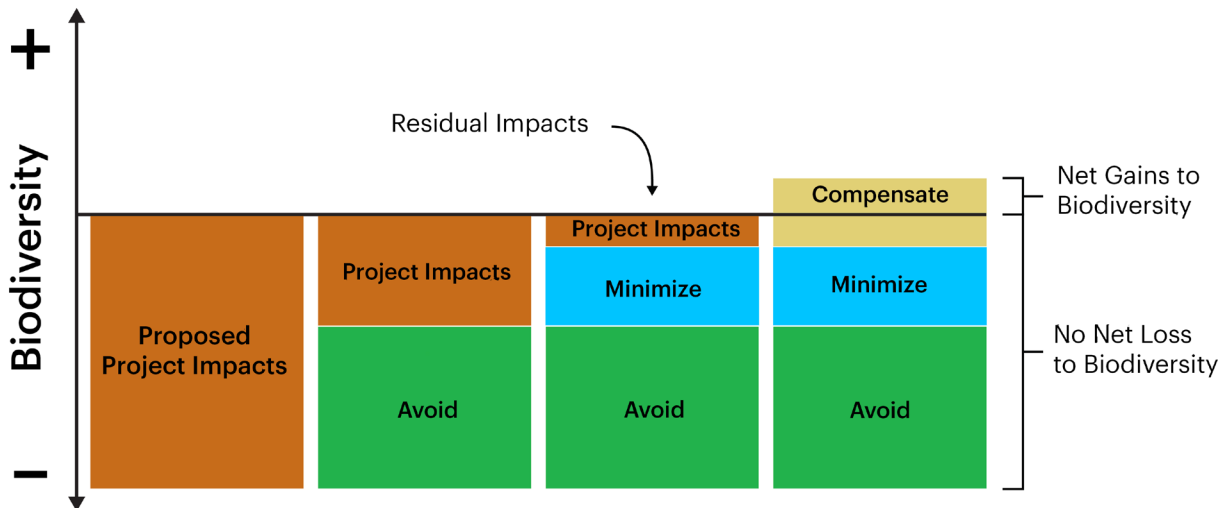


Figure 1. Visual representation of how each stage of the mitigation hierarchy can reduce potential biodiversity impacts from proposed developments. Image adapted from Rio Tinto and Biodiversity (2008).

The mitigation hierarchy provides structured steps detailing how to lessen the negative impacts of projects. However, there is no standard terminology among organisations and government agencies. The brief, therefore, aims to create more clarity by defining several terms that are often used interchangeably.

Task 34 hosted three public webinars, all of which are recorded and available on the [Tethys website](#). The first focused on strategies to compensate for the impacts on birds from offshore wind energy development. The second discussed the interactions between wind energy and terrestrial mammals, including wolves, jaguars, and antelopes. Finally, the third webinar reviewed interactions between bats and wind energy development in Latin America.

WREN organised a workshop titled *Dealing with Uncertainty-Participatory Identification of Leverage Thresholds for Impacts*, at the 2023 Conference on Wind Energy and Wildlife Impacts. The workshop included a panel of stakeholders providing perspectives from the industry, regulatory, and conservation communities, breakout sessions, and real-time polling. 54 attendees participated in the workshop.

In 2022, WREN initiated the [Wind Energy Monitoring and Mitigation Technologies Tool](#), which included 60 entries. The Tool now includes 81 technologies. WREN also supported the development of the [Offshore Wind Metadata webpage](#). The metadata includes information regarding environmental monitoring conducted at offshore wind energy projects and currently includes 22 sites from five countries (Denmark, Germany, South Korea, the United Kingdom, and the United States).

In partnership with Task 28: Social Acceptance of Wind Energy Projects, Task 34 hosted a workshop at the 2023 North American Wind Energy Academy Conference. The hybrid workshop allowed Task and non-Task participants to provide input on how social and environmental sciences can collaborate on engagement, research, and outreach activities. The two Tasks will host an annual event to continue working together.

### Highlight(s)

In 2023, WREN initiated outreach and engagement activities focused on Latin America. The objectives were to 1) introduce WREN and the Tethys website, and gauge interest

from countries serving as observers to the Task, 2) learn about ongoing research in Latin America, and 3) understand the challenges and opportunities countries are facing regarding wind energy and environmental interactions.

Through this effort, WREN hosted several virtual meetings with 31 representatives from Argentina, Brazil, Chile, Colombia, and Mexico. In addition, WREN conducted a literature review of documents related to wind energy and wildlife research in Latin America. A total of 107 documents were identified; those in English ( $n = 73$ ) were already available in the Tethys Knowledge Base. However, 34 publications and reports, in Spanish or Portuguese were not. Moreover, WREN held its first Spanish webinar on bat interactions with wind energy facilities and translated three WREN research briefs to Spanish (Bats and Barotrauma, The Mitigation Hierarchy, and Raptor Collision Risk). WREN will launch a Spanish webpage on the Tethys website in 2024.

### Outcomes and Significance

International collaboration is essential to understand how the global deployment of wind energy impacts

species and habitats that cross jurisdictional boundaries. WREN's approach is to leverage research and incorporate stakeholder perspectives to enhance our global knowledge base. The outreach and engagement activities are designed to:

1. Ensure research and recommended practices are broadly disseminated to accelerate wind energy deployment while protecting species' habitats and ecosystem processes.
2. Expand international engagement among WREN and non-WREN members.
3. Create and maintain a global technology database as a reference for available monitoring and mitigation strategies.

This knowledge transfer among participating and non-participating WREN nations may assist in advancing wind energy development by decreasing the levelled cost of energy and impacts on the environment. In 2023, the Tethys website had 240,000 users and 540,000 pageviews, and contained over 6,500 wind energy and environmental documents. A biweekly newsletter, called Tethys Blast, has 3,000 subscribers. It includes recent news articles, upcoming webinars and conferences, and new publications.

## Next Steps

Task 34 will end in September 2024. Before closing the Task, WREN will 1) host three webinars detailing the topics of the use of environmental DNA in wind energy studies, the role of uncertainty in decision-making, and incorporating environmental considerations into systems engineering, 2) develop two research briefs on bat behaviour with wind turbines and seabird interactions with offshore wind energy facilities, and 3) publish one journal article on balancing wind power generation and wildlife conservation goals. A new environmental Task is proposed to

the IEA Wind Executive Committee in spring 2024, with an anticipated start date in autumn 2024.

## References

- [1] Dempsey, L., and C. Hein. 2023. Raptor Monitoring and Minimization Technologies.  
<https://tethys.pnnl.gov/summaries/short-science-summary-raptor-monitoring-minimization-technologies>
- [2] Dempsey, L., and C. Hein. 2023. The Mitigation Hierarchy.  
<https://tethys.pnnl.gov/summaries/short-science-summary-mitigation-hierarchy>

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