

A photograph of a vast, flat landscape under a clear blue sky. The foreground is dominated by tall, golden-brown grasses, likely a marsh or coastal plain. In the distance, there are low mountains or hills. A semi-transparent grey box is overlaid on the middle of the image, containing the title text.

## Ensuring a Resilient Tidal Marsh Ecosystem through Healthy Upland Transition Zones: Assessment and Recommendations

In Partnership with

**SAVE THE BAY**



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The following field-tested protocols, monitoring framework, restoration recommendations, and project reports will help restoration practitioners and scientists evaluate transition zone habitat and refine restoration practices that maximize the benefits of wetland-upland transition zone habitat to birds. Visit the links below to download the products. More information about the project- summary, background, and goals is provided below.

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## **Transition Zone Monitoring Framework**

Based on our field testing, we created a structure for target audiences (e.g. restoration practitioners) to implement field protocols, initiate their own study, and contribute towards an integrated monitoring effort.

Individual protocols exist as appendices to the framework document:

- [Extreme Tide Survey Field Protocol](#)
- [Winter Vegetation Survey Field Protocol](#)
- [Breeding Season Area Search Field Protocol](#)
- [Spring Vegetation Survey Field Protocol](#)

## **White Paper- Guiding restoration of upland transition zones to benefit tidal marsh wildlife**

This white paper summarizes the high level findings of the study

## **Technical Report- Guiding restoration of upland transition zones to benefit tidal marsh wildlife: Summary Report 2017 Field Season**

Technical report describing study methods and findings in more detail than in the white paper.

## **Transition Zone Monitoring 2017 Pilot Protocol and Metadata**

Documentation of the study design, field methods and metadata for the 2017 pilot field work. Please contact [jwood@pointblue.org](mailto:jwood@pointblue.org) for more information.



## Project Summary

Point Blue has been working closely with fellow practitioners to assess and guide the restoration of a habitat that is critical to tidal marsh-dependent wildlife, the wetland-upland transition zone. This habitat provides refuge for marsh species, such as the endangered California Ridgway's Rail (*Rallus obsoletus obsoletus*), during extreme high tides and storms and also buffers tidal marshes against adjacent urban areas, which support human-associated predators.

Although major transition zone restoration investments have taken place recently, no one has previously quantified the benefits of this habitat for tidal marsh species or identified the important features to be maintained or restored. This lack of information inhibits our ability to design restoration or other adaptation strategies that maximally benefit target species. Our project focuses on addressing the questions:

- What transition zone features and characteristics support a resilient tidal marsh ecosystem?
- How can tidal marsh dependent wildlife benefit from a healthy transition zone?
- Which key transition zone characteristics should be restored or enhanced?

In order to determine how wildlife benefit from specific transition zone features and thus to guide restoration, we initiated a comprehensive monitoring effort in 2017 that included birds, vegetation and other site characteristics, as none existed prior to this study. We developed and field-tested survey protocols, with data contributing to our analysis. Products from this study include four main documents, including restoration recommendations and a monitoring framework, available through the links below.

**Our study has confirmed the importance of the transition zone for tidal marsh dependent bird species** and identified specific characteristics of the transition zone found to be beneficial. These findings have important implications for the design of transition zones as part of the restoration or enhancement of tidal wetlands. We found that **both physical features and vegetative characteristics of the transition zone contribute to healthy, growing tidal marsh-bird populations.**

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## Restoration Recommendations

- **Test New Ideas:** Design restoration to evaluate and compare new practices- Test new ideas (e.g., planting clumps of dense vegetation) by using an experimental design incorporating treatment and control plots within, and if possible, among sites.
- **Use the framework:** Use the transition zone monitoring framework to improve site- and regional-scale understanding - This provides an integrated and standardized means to assess success, test new ideas, and increase knowledge, both for individual sites and at the regional level
- **Restore for dense vegetation:**  $\geq 30$  cm - Having at least 15% of the transition zone area covered in dense vegetation ( $\geq 30$  cm from the ground) is beneficial to tidal marsh birds.
- **Restore for tall plants:** 50-100 cm- Plant height up to about 100 cm was associated with increasing Ridgway's Rail populations. However, benefits to rails plateaued above 100 cm.
- **Design wider transition zones:** greater than 25 m- Wider transition zones were associated with tidal marsh bird population growth. Transition zones wider than 25 m were more likely to have positive trends in the adjacent tidal marsh bird population.
- **Restoring steep levees has benefits:** Whereas we found wide, gently sloping transition zones to be good for tidal marsh birds, we also found no negative effects of a steep sloped transition zone. Therefore, restored levees with taller, dense vegetation can provide benefits to tidal marsh birds as well.
- **Use multiple species:** Don't restrict restoration to a single plant species- Plant structure (height and dense vegetation) was more important than a specific plant species. The height and stem density of marsh gumplant is beneficial to tidal marsh birds but other plant species such as California sage (*Artemisia californica*) and salt marsh baccharis (*Baccharis glutinosa*) may fulfill those needs.
- **Grasses can be beneficial:** Grasses can provide cover for tidal marsh birds, while their removal (absent supplemental planting of tall dense vegetation) can reduce the benefits to tidal marsh birds such as Ridgway's Rails. Grasses may also provide forage for additional tidal marsh species such as the salt marsh harvest mouse.



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**Point Blue Conservation Science** – Point Blue's 160 scientists develop nature-based solutions to climate change, habitat loss, and other environmental threats to benefit wildlife and people. Our mission is to conserve birds, other wildlife and ecosystems through science, partnerships, and outreach. Explore more at [www.pointblue.org](http://www.pointblue.org).