Fire Effects on Yuma Clapper Rails and California Black Rails on the Lower Colorado River

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Figure 1. California black rail
(Laterallus jamaicensis coturniculus)

Figure 2. Yuma clapper rail
(Rallus longirostris yumanensis)

Introduction

- California black rail (Fig. 2) is considered threatened in California and endangered in Arizona.
- Yuma clapper rail (Fig. 1) is listed as federally endangered by USFWS.
- Large spring floods historically scoured marshes along the Lower Colorado River, ridding wetlands of decadent vegetation and encouraging early successional growth.
- Flood control efforts have eliminated spring floods resulting in build-up of decadent wetland vegetation and lack of early successional emergent plant growth (Fig. 3).
- Prescribed fire might reduce decadent wetland vegetation, encourage early successional growth, and therefore improve habitat for wetland birds including the California black rail and Yuma clapper rail (Fig. 4).

Figure 3. Decadent wetland vegetation in the absence of spring flooding and fire

Figure 4. Early successional wetland vegetation 5 months post-fire

Methods

- Transects along wetlands on the lower Colorado River in AZ and CA, and south of the Salton Sea in CA (Fig. 5), were assigned to one of two groups: burn or control.
- Each burn transect was paired with two un-burned (control) transects in a BACI experimental design.
- Standardized call-broadcast surveys were conducted along all transects during successive breeding seasons (both pre- and post-fire treatments) to assess relative abundance of California black rails and Yuma clapper rails.
- We also measured changes in vegetative structure and relative prey abundance at burn and un-burned transects.
- We conducted a repeated-measures analysis of variance (RMANOVA) to determine if changes in the abundance of Yuma clapper rail and California black rail differed between paired burn and control transects in pre- and post-burn years.

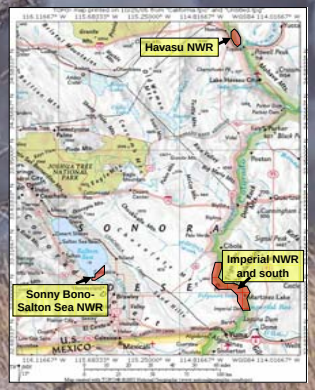

Figure 5. Study site

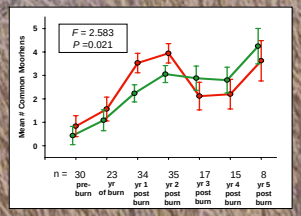

Figure 8. Mean # of common moorhens on burn vs control transects

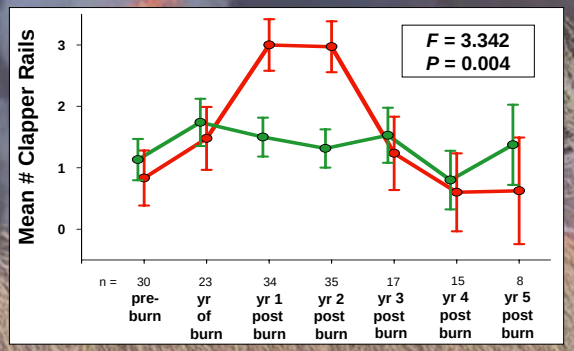

Figure 6. Mean # of Yuma clapper rails on burn vs control transects

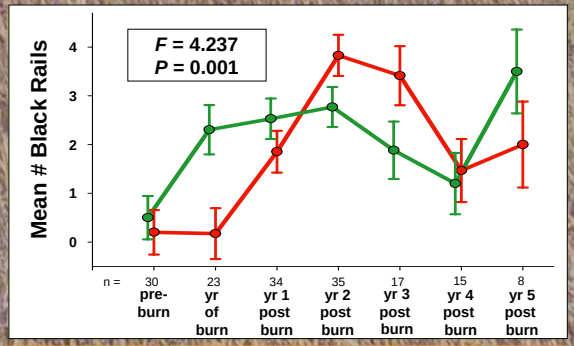

Figure 7. Mean # of California black rails on burn vs control transects

Preliminary Results

- Relative abundance of California black rails and Yuma clapper rails increased (P=0.001and P=0.004) in response to fire (Fig. 6 and 7).
- Relative abundance of other marsh birds also increased in response to fire (Fig. 8).
- Fire did not have a negative effect on any species of secretive marsh birds.
- Effectiveness of fire was no longer visible 3 years after burns for both Yuma clapper rails and California black rails. These results suggest a 3-4 year rotational prescribed burn schedule would provide optimal rail habitat.

Future Objectives and Analysis

- Data collection will continue through 2008. New data will increase number of burns and improve statistical power to the results presented here.
- Models will be developed to assess the relationships between changes in relative rail abundance, vegetative structure and relative prey abundance, at burned and unburned transects.
- Further analysis will better determine burn frequency needed to maximize habitat quality for clapper rails and black rails.
- Study results should provide managers with a proven method to increase rail habitat quality and help de-list these rare birds.