

#### THE CALIFORNIA BLACK RAIL REPORT

A NEWSLETTER FOR LANDOWNERS COOPERATING WITH THE CALIFORNIA BLACK RAIL STUDY PROJECT

http://nature.berkeley.edu/~beis/rail/

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### **BLACK RAIL PROJECT EXPANDS STUDY AREA TO MARS**

Don't believe the headline above, but the truth is we really are expanding our study because we've had some real successes. We've learned how to harmlessly trap, collect data, and then release large numbers of Black Rails and Virginia Rails. With these larger samples, using special techniques we'll talk about in this newsletter, we are beginning to coax some secrets from the elusive California Black Rail you see peeking out of the weeds in the picture above, of how it is related to other populations of Black Rails and the reasons for the patterns of ups and downs in the foothill populations we've been surveying on your property for the last eight years.

The newly hatched Black Rail chick to the right is saying, "Yipee!", and certainly, "Thank you", for your cooperation. He (or she) seems also to be asking you to return the enclosed post card as soon as you can because we will be starting our activities in mid-May this year. We will be doing our usual very quick surveys of wetlands we think should be inhabited by the rails, using recordings of the birds' calls to elicit tell-tale responses. If we don't get a response, we try again during two more visits. In three tries, we have a 99% chance of detecting Black Rails. It only takes us a few minutes to assess the presence or absence of the birds, and we know how to respect your privacy, gates, and fences. These year-to-year assessments yield valuable information for interpreting the condition of Black Rails populating the Foothills. First discovered in the Foothills in 1994, we thought they lived only along the California coast. Our birds are distributed in a network of patches big and small on public lands like the Spenceville and Daugherty Wildlife



Areas, the U.C. Sierra Foothill Research and Extension Center, and Beale Air Force Base, but also on nearby private land, so we can't cover the full extent of the birds' occurrences or potential occurrences without appealing to owners of wetland sites for permission to come onto your property to continue our long term study.



Here's the way we think the Black Rail populations are doing. We think we got hit by the West Nile Virus outbreak that infected many wildlife species, starting in California in 2003 and peaking in our area in 2006. Rails don't seem to have recovered yet. Last year was another high local extinction year (blue line), as well as a time of greater virus detection in our birds. And the colonizations of new birds moving into unoccupied sites were also at a low value (green line), as has been the trend since 2007. Our guess is that the wet spring we are currently experiencing will increase occupancy of many sites, and we will detect an increase in colonizations at some of the currently unoccupied sites that have been depleted these last two dry years. Alas, the extended wet season may also give us a crop of West Nile Virus infected mosquitoes to once again knock back the population. Trends for Virginia Rails, which are found in the same small wetlands with Black Rails, also follow the same pattern.

## **Trapping Update**

Mist netting is a tried-and-true method for catching birds for banding or other research efforts. The mist net, as its name implies, is a very finely-woven, nylon net. It is barely visible to flying birds and they become entangled in it. Birds can be carefully removed unharmed for study and subsequent release. Black Rails, however, don't do a lot of flying around. They live beneath the dense vegetation of small, barely wet marshes, and their small size—about that of a large sparrow or small robin—allows them to mostly walk around in tunnels under the protection of this dense cover. So we put our mist nets down into their realm, tacking it into the mud. This is a pretty rough, unorthodox treatment for the finely constructed and expensive nets. But it works!! When we play recordings of rail calls from one side of the net, the birds



are either attracted, irritated, or both, and home-in on this strange new singer in their territory. Whatever the attraction, curiosity, aggression—or perhaps even love—they frequently stride quickly and boldly toward the sound source, sometimes even hitting the net so hard they bounce off. Once entangled, we remove the rail immediately, place it in a comfortable little bag, and take it to a nearby protected spot.

Prior to release back into their territories, rails are banded on their right legs with Fish and Wildlife Service standard bands, and lots of notes taken of their size, weight, sex, age. etc. Then a few tiny portions of a feather are carefully removed with scissors. These will allow us to analyze various isotopes, unusual forms and combinations of chemical elements that

tell us what the birds have been eating in their environment. It's a kind of fingerprint of particular environments, and can tell us, for example, if the birds have been in freshwater or saltwater marshes. We want to know where our birds have been spending their lives. Then a tiny blood sample is taken for DNA analysis. This is the real gold that will tell the genetic history and relationships of individual rails, allowing us to piece together the mystery of their origin and movements. The blood sample is also analyzed for exposure to West Nile Virus infection.

Last year alone we captured 42 Black Rails and 12 Virginia Rails, a significant addition to our previous years' Foothill captures. We obtained permission from six private land owners to come onto their property and set up our mist net, so some of your very own birds are part of the family history we are assembling! In addition to our trapping success in the Foothills, we have captured rails from coastal and estuary marshes of the Bay Area, and also from the small population in Southern California along the Mexican border. So we now can compare the DNA of birds from these three isolated, widely separated areas. Did the Foothill birds come from the Bay? Or did they get here from down South? Or maybe

even long distance from the rails of Eastern USA marshes. On p.3 of this newsletter you can review some of our freshest results.

# California black rails depend on irrigation-fed wetlands in the Sierra Nevada foothills

*by* Orien M.W. Richmond, Stephanie K. Chen, Benjamin B. Risk, Jerry Tecklin *and* Steven R. Beissinger



This is the headline from our most recent publication as it appears in the latest issue of **California Agriculture**, April-June 2010, p. 85. It will soon be up on the Cal Ag website ( http://californiaagriculture.ucanr.org ); or on our website (see back page). We characterize Black Rail habitat in detail, especially the vegetation and hydrologic setting in the landscape, and give management recommendations. Read it online, or contact us and we can email you a copy.

#### **Interesting New Results**

What you see here is the family tree we are working out from the DNA samples we've derived from the blood of the Black Rails we've trapped, from rails others have trapped, and from scraping off a tiny bit of



skin from legs of specimens stored away in museums. We were able to look at small areas of the DNA molecule from a lot of individual birds from many different geographical areas. It's like looking at hereditary fingerprints and comparing them. With a bit of knowledge (this always helps) and some assumptions, it's even possible to make some guesses about the history of the birds. We're able to do this because of the enormous advances in molecular genetics over the last few decades. It has also helped to have geneticist Dr. Philippe Girard as part of our Black Rail Project.

If we have Black Rails in four distinct and widely separated groups, who is related to whom and how closely? There's a large population of rails in coastal marshes of the San Francisco Bay region (samples with red labels in the

diagram); a population of unknown but probably moderate size in the Sierra Foothills (blue labels); a small population along irrigation canals and wetlands of the Lower Colorado River in Southern California (green labels): and numerous Black Rails in eastern North America (yellow labels) that are thought to be so different that they have a different subspecies name than our California rails.

The Bay Area and Foothill Black Rails segregate into two distinct genetic groupings, but with intermixture of genetic types within each. It is likely that the Foothill rails originated at some time in the distant past from the Bay rails, but we have indications that there is also recent genetic interchange, with a greater genetic influence coming from the Foothill rails into the Bay. It's an unexpected finding we are currently examining. It seems that the larger, more stable marsh environments of the Bay may harbor a less diverse and more stay-at-home population, while the Foothill rails exist in a patchy network of changeable, even often ephemeral, environments that encourages a lot of movement between patches. This seems to be supported by the genetic evidence of random breeding throughout the whole Foothill patch system. What seems really clear is that both the Foothill and Bay rails are widely separated genetically, and probably historically too, from the rails of Southern California. Rails from Eastern North America (only a small sample so far), seem clearly distinct but well within the genetic family. Perhaps they are too closely related to be thought of as a separate subspecies as has been our scientific practice without the benefit of genetic evidence.

We characterize these findings as tentative, but they give us directions for future research to clarify these relationships.

**WHO WE ARE** This research was begun in the late 1990's by **Jerry Tecklin**, a Research Associate at the University of California Field Station near Browns Valley where he was stationed for many years. For several years the California Department of Fish and Game contracted him to look for Black Rails in the foothills. Over the years, many of you have been contacted by Jerry for permission to enter your property. Nine years ago **Dr. Steve Beissinger** began to work with Jerry and founded the **Black Rail Study Project**, the current long-term study we are now doing. He is a distinguished professor in the Department of Environmental Science, Policy, and Management at the University of California Berkeley, and a nationally recognized leader in studying rare birds and their conservation. You will not see **Orien Richmond** on this year's field team, since he is receiving his Ph.D. at UC Berkeley based on his Black Rail work these last few years, and will be heading out into the cruel rail-less world. **Laurie Hall** is now our main Ph.D. candidate in charge of the project in the field, and will be continuing trapping rails for genetic studies of various kinds for the next few years. This year you are likely to encounter her main assistants, **Jennifer Bruce** and **Marissa (Mo) Goodnow**. Both have Masters Degrees in field biology. Jen did her work at Corvallis, Oregon, with a stint in Australia, and Mo did hers at Plymouth State in Plymouth, N.H., with experience in red-maple swamps. We are fortunate to have these two highly trained professionals on board.

You can always contact us by calling the Field Station, 530-639-8809; or emailing Jerry at jetecklin@ucdavis.edu, Laurie at lahall@berkeley.edu, or Dr. Beissinger at beis@berkeley.edu. Consider visiting our website: <a href="http://nature.berkeley.edu/~beis/rail/">http://nature.berkeley.edu/~beis/rail/</a>. There you will find pictures as well as sound recordings of rails (look under "Links"), and lots of other information.



Steve



Jerry



Laurie with a rare Yellow Rail



Mo with Sharpshinned Hawk



Jennifer