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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2009 !

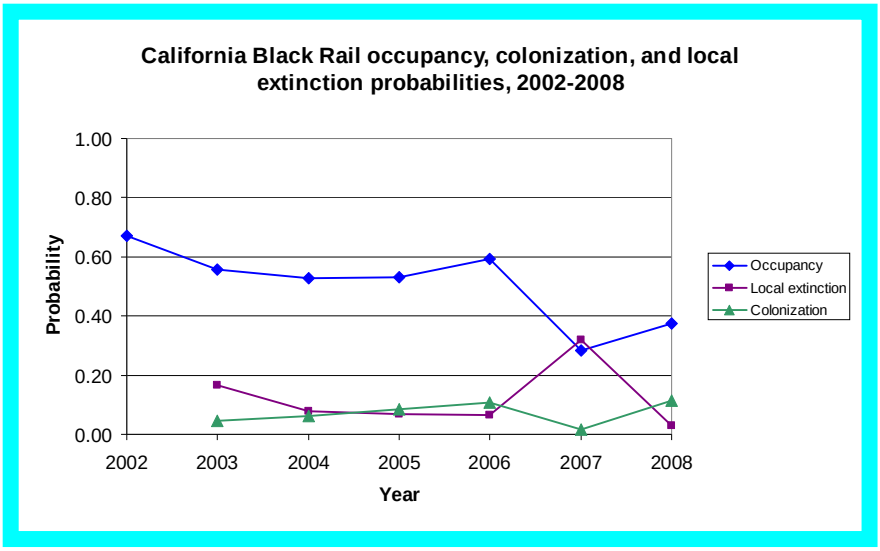
It's true. Hard to believe, we are in our eighth consecutive year of the Black Rail Project. Some of you have been receiving this newsletter annually for seven years since we started the Project in 2002. It's time to remind you what this is all about and brag about our recent activities and findings. And to remind you that we will again be in the field this year attempting to detect the elusive California Black Rail population of the Sierra Foothills to assess the status of this peculiar biological phenomenon. As always, we extend our heartiest **Thank You** for your cooperation in allowing us to enter your property and wetlands. This Project may turn out to be one of the longest cooperative biological studies on private and public lands, and it's only happening because of you.

In 1994 Black Rails were first discovered at the University of California Sierra Foothill Research and Extension Center (the "Field Station", as the locals call it } near Browns Valley in Yuba County. Very strange, since they had only been known from northern Californian coastal marshes and a few spots along the Lower Colorado River at the Arizona and Mexican border. They turned out to be widely distributed in the foothills, often in tiny marshes, fed by irrigation leaks or runoff. Strange indeed, since this is the tiniest rail in the world—about the size of a large sparrow—and almost never seen because of its secretive habits. In fact, the only way we detect them is by playing a tape of their song, which they very obligingly answer revealing their presence. We found them spotted throughout the lower foothills on public lands like California Dept. of Fish and Game's Spenceville Wildlife Area, and on many private properties, such as large cattle ranches, below pond outflows, but sometimes in tiny wetland remnants in backyards. In 2002 we began tracing where and how often Black Rails were appearing, disappearing, and often re-appearing at hundreds of locations in what has become an ongoing "metapopulation" study; that is, how this population of little populations "works" across the foothill landscape of Yuba, Nevada, and Butte Counties. We're still at it, and we've expanded our study. And in the box below is our annual pitch to you for permission to once again come on your property.

You can help us by returning the enclosed postcard as soon as possible. If we don't hear from you, we will try to reach you by phone to once again get your permission to come onto your property to check for the presence or absence of the Black Rails this year. Your cooperation is advancing our understanding of how creatures live in the fragmented habitats that interact with our own living space in the real world. While most wildlife studies focus on wild places and wilderness locations, we are interested in what is going on in our very backyards.

Black Rail Update

Last year we reported a sudden drop in occupied sites from what we'd found in 2006. It appears the rails didn't recover in 2008 from this 2007 decline. We thought this might be related to West Nile Virus which exists in our area. Blood analyzed from rails we trapped did indeed show they'd been exposed to the virus, and we think it's probably one of the causes of widespread mortality that may have resulted in the Crash of 2007.



WHAT IS BLACK RAIL HABITAT ?

In an article by Orien Richmond and others of the Black Rail Project soon to appear in the journal *California Agriculture*, we analyzed numerous sites with and without Black Rails to evaluate statistically what were the important constituents of Black Rail habitat. Here's a summary of some of our conclusions.

About two-thirds of Black Rail wetlands in the Sierra foothills are located on private land. Thus, long-term conservation of Black Rail habitat here will depend largely on management decisions made by private landowners.

Black Rail wetlands in the Sierra foothills are a patchy network embedded in a matrix of oak woodland and annual grassland. Most of these wetlands are fed by irrigation water, so water management and irrigation practices can have substantial effects on these biologically-rich resources. The distribution of these wetlands is closely associated with irrigation canals, while approximately one-quarter of wetlands are fed primarily by natural springs. **The fate of Black Rails in the Sierra foothills appears to be linked with irrigation water.** Most irrigation water in the Sierra foothills is currently used to produce pasture for livestock. Despite some negative impacts from heavy grazing, livestock grazing may be more compatible with sustaining Black Rail populations in the long term than conversion of rangelands to urban or suburban development. While only 11% of rail wetlands receive water primarily from irrigation canal leaks, the lining of existing canals to improve their efficiency is likely to lead to the loss of these habitats, with negative consequences

Black Rails exhibit clear habitat preferences in the Sierra foothills for larger, permanently flooded sites. Wetlands with at least one Black Rail occurrence from 2002-2008 were, on average, larger and lower in elevation than those without Black Rails. Previous studies have noted that shallow water depths (generally less than 1 inch) are preferred by Black Rails, and our work confirms this. We found rails in wetlands primarily receiving water from irrigation canals, and less often in wetlands primarily receiving water from springs or rainfall. Black Rails occurred less often in pond fringes, and more often with flowing water, standing water, and saturated mud. Fringe wetlands typically have only a narrow strip of emergent vegetation, and may be less suitable for Black Rails because they lack sufficient shallow water habitat. The presence of flowing water, standing water, and saturated mud are all indicators of sites that are likely to maintain water throughout the dry summer and fall months. Black Rails were much less likely to be found in wetlands that dried up by summer's end.

Our wetlands with Black Rails had denser vegetation than those without Black Rails. The most likely plants to be found in our Black Rail wetlands were two species of rushes, cattails, two species of spikes rush, Dallis grass, Smartweed, Willow-Herb, Rice Cutgrass, as well as a sprinkling of other grasses and sedges. Interestingly, Black Rail sites did not differ from sites without Black Rails with respect to the species of plants present there, and the kinds of plants or their height were not as important for Black Rail habitat selection as was having dense cover and appropriate substrate characteristics, generally a wet to muddy substrate interspersed with small shallow pools (less than about 1 inch deep). Marshes with very short or highly disturbed vegetation from mowing or heavy grazing were generally unsuitable for Black Rails. However, rails may persist for some time in very small (1/10 acre) remnant patches of intact vegetation at an otherwise disturbed site.

Research Round-up

Using Radios to Track Black Rails

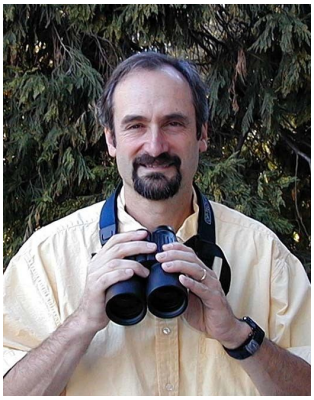
Last summer we experimented with methods to trap Black Rails, put tiny radio transmitters on them, and see where they go by monitoring their locations in the field with receivers tuned to their radio frequencies. The picture below shows a handsome adult male Black Rail (adults have red eyes), with a permanent U.S. Fish and Wildlife Service band on his right leg, and trailing the antennae of his radio temporarily glued beneath his feathers. He is in a holding cage for observation prior to release. The cage wire squares in the background are 1 inch by 1 inch, so you can see how tiny he is. His radio weighs 1.2 grams; he himself weighs 30 grams. This radio transmits for 8 weeks, so we have to catch the bird once again to change his batteries to continue tracking him. We learned we could do this successfully; we had an advantage for re-trapping him since his radio always revealed his location in the wetland. We confirmed that Black Rails spend their time in a very small area, probably no more than half an acre, but a lot more needs to be done before we can be sure how large their home ranges are, if and when they leave, and where they go. We're already sure they stick around in the foothills throughout the winter, but we know almost nothing about their movements over the landscape. We also discovered that it takes an enormous amount of time to keep track of their movements, so we want to explore other methods that might reveal how the birds in different patches throughout their distribution are or are not related, so we might make some guesses how they move around.

Using Molecular (Genetic) Markers to Reveal Relationships

We are fortunate to collaborate with Dr. Philippe Girard, a post-doctoral fellow from the Université de Montréal, whose research has focused on using genetic markers to understand the distribution, evolutionary history, and genetic structure of fish. He is skilled in obtaining and interpreting portions of an animal's DNA. This is a direct method of reading our bird's inheritance code and relating its genetic makeup to other birds from other parts of their distribution, or even from nearby patches within our foothill network of little populations. To get at this remarkable molecule in our birds' cells packed with its genetic information, we obtain a minute sample of their blood from which to distill its DNA. But first we need to trap them, pretty much like we do for radio tracking. The picture shows our typical trapping setup along an irrigation canal leak in the desert in Southern California near the Colorado River. Dr. Girard stands at one end of a very finely-woven net, a "mist net", erected in a narrow slit in dense cattails. He's poised to pounce, while another team member plays Black Rail calls to attract the rails into the net. Once netted, we carefully extract a tiny sample of "red gold" and release the bird back to its wetland. "Red gold" because the DNA obtained from this blood sample may unlock answers to numerous questions about the consequences of habitat fragmentation for the genetic integrity and viability of populations. We may be able to answer where our Black Rails of the foothills come from, whether they are related to those in the Southern California desert, or whether they are more related to those in the Bay Area. This sophisticated genetic analysis may tell us whether our foothill rails are a remnant of an ancient, larger rail distribution that existed in the vast expanse of wetlands that once graced the California landscape but has now disappeared as a result of agricultural conversion and urbanization. Our tiny rail has the potential to answer some big questions that may be applicable to the conservation of other species, many of which also find themselves isolated in small habitat fragments in our contemporary world, which is becoming ever more dominated by humans.

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 where he was stationed for sixteen 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. Eight 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. This year's field team will also consist of **Elizabeth Hunt**, who helped us last year and will soon be enrolled in grad school in New York; **Laurie Hall**, a new Ph.D. student of Steve's at UC Berkeley; and **Brandi Gartland**, a graduate in physiology and neuroscience from U.C. San Diego. **Orien Richmond**, whom many of you know, is finishing up his Ph.D. work and won't join us much for field work this season.

You can always contact us by calling the Field Station, 530-639-8804; or emailing us at jetecklin@ucdavis.edu, orien@nature.berkeley.edu, or Dr. Beissinger at beis@nature.berkeley.edu. Consider visiting our website: http://nature.berkeley.edu/~beis/rail/. There you will find pictures as well as sound recordings of these birds (look under "Links"), and lots of other information.



Steve

Jerry

Elizabeth

Brandi

Laurie