



THE CALIFORNIA BLACK RAIL REPORT

A NEWSLETTER FOR LANDOWNERS COOPERATING WITH THE

CALIFORNIA BLACK RAIL STUDY PROJECT

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

Vol. 12, No. 1

RAILS IN A DROUGHT

The Black Rail Project is now a teenager! That's right, this will be our thirteenth summer coming out tracking the secretive California Black Rail (pictured in its natural, hard-to-see state above). Thirteen years is a long time to collaborate on a project, but with your help we've managed to learn a lot about North America's most secretive bird and the world's smallest rail. Your cooperation also gives us a unique and exciting long-term dataset about wildlife on private land, unlike most research that often focuses on big nature reserves. So we want to again say **THANK YOU** for cooperating with our study and making it all possible. Once again, we've included a postcard for you to mail back to us to let us come out to conduct our surveys again this summer. *Please take the time to fill out the postcard and return it! It is a huge help to us.*

California's historic drought is on everyone's mind this summer, and we have no doubt that it's on the rails' little bird-brains as well. This past January and March we called some of you to get permission to do a few surveys of the winter status of the birds and the wetlands. Many of you told us in January that you had never seen your wetlands as dry as they were this winter — and many of the wetlands had dried out (see page 2). Our surveys found that the rails disappeared from most of the wetlands that had dried, but by March many of the wetlands looked great again — many even wetter than they were last summer! We're interested in seeing what the wetlands are going to look like throughout this summer and how the rails will fare. Will the rails that fled the drying wetlands in the winter come back?

To figure that out, this summer we will continue our monitoring of the Black Rails and Virginia Rails that live in the scattered, small wetlands in the foothills of Butte, Yuba, and Nevada counties. These surveys take only a few minutes: one of our trained field technicians quietly enters the wetland, plays rail calls, and listens for a response. Tony, our resident West Nile Virus specialist (see page 2), will also be conducting his third and likely final round of mosquito trapping. He may call some of you to ask additional permission to set traps by your wetland. At some of our survey sites we will also count the number of other bird species present by listening for their calls for a short time. These "point count" surveys will allow us to figure out if bird species are present, like Robins, that are more frequent carriers of West Nile Virus than other species.



A dry local wetland in January 2014.

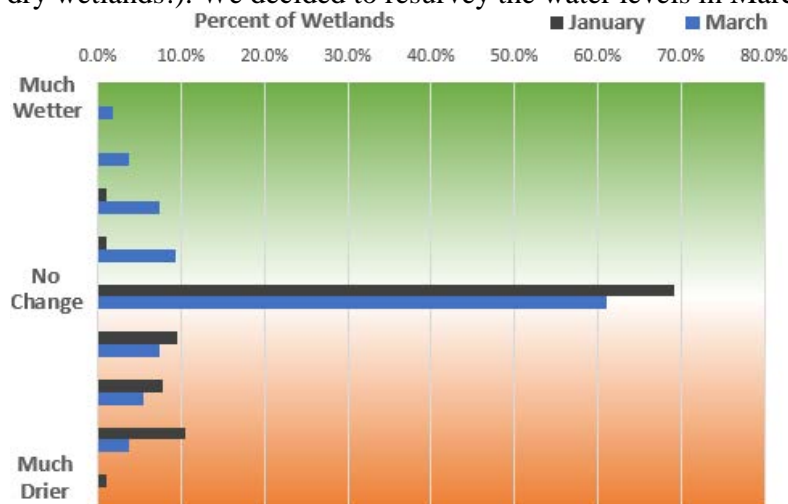
RAIL UPDATE

Our field work is monitoring the presence or absence of rails (what we call **occupancy**— shown in **green** on these graphs) in wetlands of the Foothills for quite some time now. This has allowed us to track **colonization** (the probability that a wetland will become occupied by rails— shown in **blue**), and local **extinction** (the probability that a wetland will become unoccupied by rails— shown in **red**). This long-term data allows us to see several interesting patterns. For one, since the arrival of West Nile Virus in 2006, extinction in the Black Rails has spiked every few years in a fairly regular cycle. Also of note is that this is not the first drought we've tracked the birds through—2008 was also a very dry year! However, occupancy stayed roughly the same then and the birds seemed to do OK. We're interested in seeing if both of these patterns hold for 2014!

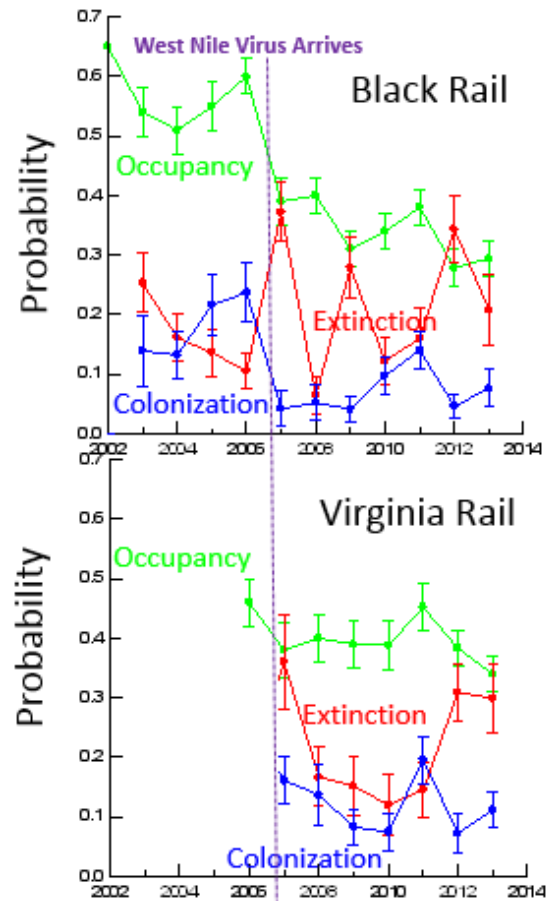
WETLANDS IN WINTER

As we mentioned, in January we called some of you to ask permission to survey your wetlands so we could see if the birds were staying in the same wetlands in the winter that they had occupied during the summer. We wanted to learn about their winter movements to determine the importance of the so-called “rescue effect”—where a wetland that appears to stay occupied by the rails through two consecutive summers actually becomes unoccupied during the winter (“local extinction”) and is re-colonized (“rescued”) before the start of the breeding season. Our annual summer survey data strongly suggested that the rescue effect is important for Black Rails because isolated wetlands are much more likely to go extinct. This is what we'd expect if the rescue effect is important—birds are disappearing from many sites in the winter, but the isolated sites aren't getting recolonized by other rails that are dispersing. There's a lot of indirect evidence like this supporting the theory of the rescue effect, but it has rarely been directly observed in wild bird populations! This summer, our resurveys of the wetlands that went extinct during the winter will allow us to directly test if the rescue effect is what causes this correlation between isolation and extinction. If wetlands that were unoccupied during our winter surveys become recolonized this summer by rails, we'll know the rescue effect is at work!

And there were plenty of winter extinctions to test this with: nearly a quarter of the wetlands we surveyed had dried to some degree. The graph below visualizes this, with the wetlands ranked into five categories that compare the change in their condition from summer to winter, ranging from much wetter, to “no change” to “much drier.” The rails were gone from most of the wetlands that dried out (though surprisingly, we did find some hanging on in a few dry wetlands!). We decided to resurvey the water levels in March (in **blue**) to see if the late rains had helped, and



many of the wetlands had indeed recovered. Many were even wetter than they had been the previous summer! Complex interactions among the supply of irrigated water, rainfall runoff, and natural springs and creeks seem to drive these changes, and we're just beginning to tease them out. We suspect that these complex, varied water regimes during the winter “off season” may be behind some of the occupancy patterns we observe in the summer. We'll be returning to do another set of surveys next January and March to see if these patterns hold (we'll call and ask permission again before we do so).



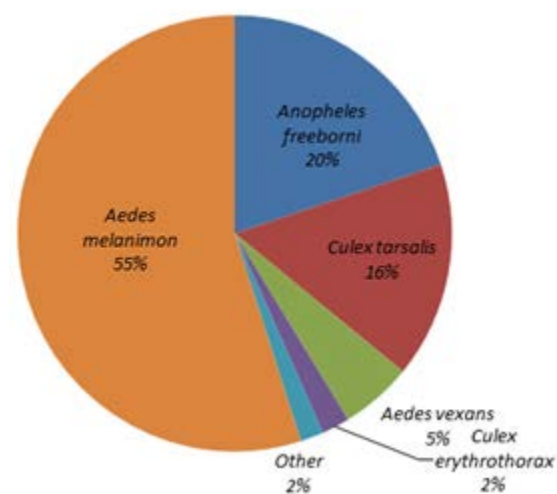
RAIL CAPTURE UPDATE

Ph.D. student Laurie Hall has been asking you for permission to survey and capture rails in your wetlands for the past five summers—that's her hand holding a mother & chick she caught. But not this year. Now, Laurie is busy in the lab preparing all of those DNA samples she collected, and she's finding some interesting (though less cute) results. She's using the genetic data to make comparisons between Black Rail populations in the Sierra Foothills and in the San Francisco Bay Area. The wetlands where rails live in San Francisco Bay are very different from the wetlands we have here in the foothills. They are much larger and less likely to dry out. These ecological differences might account for differences between the two regions in population size and genetic diversity of the rails. Laurie can use her genetic data to estimate an "effective population size" for each population, which measures the number of individuals that raise offspring that survive to the next generation. The effective population size is usually about one-fourth to one-tenth the size of the size you get if you had counted all of the birds. But it's really hard to count shy little rails, so Laurie's effective population size estimates are very helpful for comparing the sizes of rail populations. She found that the Black Rail population in the Bay Area is more than four times larger than our rail population in the Foothills. In addition, Black Rails from the Foothills have less genetic diversity than birds in the Bay Area, probably because our wetlands in the Foothills are smaller and often dry up, forcing the rails to fly away and find a new wetland. The good news for our little population of rails in the Foothills is that they seem to have no trouble flying between wetlands. Laurie's genetic data suggests that Black Rails in the foothills move between wetlands more frequently than in the Bay Area. Laurie's next task is to figure out how often these little birds fly between the Bay Area and the Foothills. The connection of these two regions by dispersing birds probably plays an important role in maintaining the population sizes and genetic diversity of both populations.

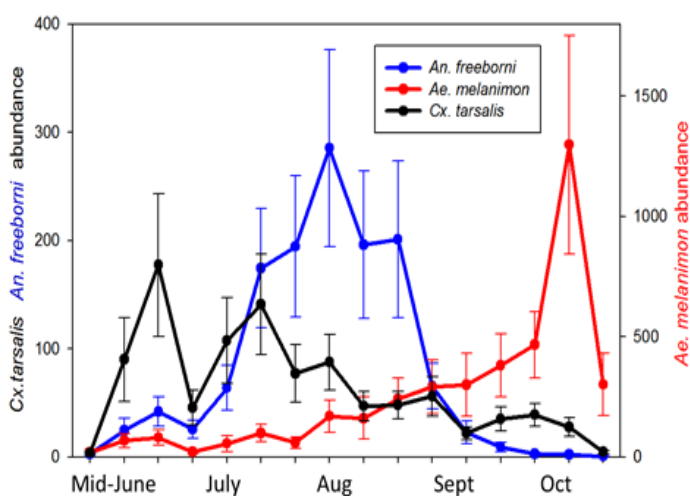


SKEETER UPDATE

Over the last 2 summers, Tony Kovach, a native of Amador County and currently a Ph.D. student at UC Santa Cruz, has been capturing mosquitoes across Yuba, Butte and Nevada counties. The mosquitoes are trapped using a small battery operated fan trap hung next to a small cooler filled with dry ice. Over the course of the night the dry ice slowly gives off CO₂, simulating a breathing animal, and this attracts female mosquitoes that get sucked into the fan trap. By setting these traps at sites, Tony measures mosquito species composition and abundance at different wetlands to better understand if West Nile virus has had an impact on Black Rails. During the last 2 summers, he's caught over 1.2 million mosquitoes at 60 different wetlands and has identified 18 different mosquito



species (upper pie graph). Three species make up over 90% of the total mosquitoes caught. *Aedes melanimon* and *Anopheles freeborni* are largely associated with rice fields and are the one's you're most intimately familiar with because they feed on mammals. *Culex tarsalis* is abundant across the study area, with greater abundance at sites near rice fields. It feeds on both birds and mammals. These 3 species also show noticeable differences in their patterns of seasonal abundance (lower graph), with *Culex tarsalis* peaking early summer, *Anopheles freeborni* peaking in mid-summer, and *Aedes melanimon* peaking in late summer. How mosquito populations will respond to this year's drought is something we hope to determine. Tony and his team will be continuing their work, trapping mosquitoes around the area again this summer.



WHO WE ARE This research was begun in the late 1990's by **Jerry Tecklin** (smooching the rail below, top-left), a Research Associate at the University of California Field Station near Browns Valley where he was stationed. For several years the California Department of Fish and Game contracted him to look for Black Rails in the foothills. During this time many of you have been contacted by Jerry for permission to enter your property. Thirteen years ago **Dr. Steve Beissinger** (top-right) 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 researcher of rare birds and their conservation. Many of his students have made significant contributions to the project. **Nathan Van Schmidt** (center-left) will be leading the rail surveys for a fourth summer. Smiling "Mosquito Man" **Tony Kovach** from UC Santa Cruz (center-right) will be leading his own team of three field technicians this summer (not pictured). We're lucky to have **Tricia Gardner** (bottom-center) returning for a second summer as a rail field technician, and she's joined by two new technicians: **Chance Hines** (bottom-left), a very experienced bird expert, and **Kymberly Sugano** (bottom-right), a central valley native who graduated last year from UC-Davis. You can always contact us by calling the Field Station, 530-639-8809; or emailing Nathan at vanschmidt@berkeley.edu, Jerry at jetecklin@ucdavis.edu, or Dr. Beissinger at beis@berkeley.edu. Consider visiting our website: <http://nature.berkeley.edu/~beis/rail/>. There you will find pictures as well as sound recordings of rails (look under "Links"), past newsletters, and lots of other information.

