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BIRD MAN: William Monahan at the Audubon California office in Emeryville.

DAVID PAUL MORRIS, FOR THE REGISTER

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Sunday, December 2, 2007

How are birds affected by global warming? An Audubon scientist seeks definitive evidence of species shifts in response to warming.

By PAT BRENNAN

THE ORANGE COUNTY REGISTER

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The first black skimmer ever seen on the U.S. West Coast appeared, as luck would have it, at the mouth of the Santa Ana River.

That was in 1962, and it was a marvel to bird enthusiasts. It had never been observed anywhere in Southern California.

The bird, which skims along water surfaces, dragging its lower beak through the waves, is still a crowd pleaser today. But now it's here in the hundreds – and not only as a visitor but in restive, squabbling breeding colonies.

For these and other species, scientists increasingly are asking a simple question: Why? And the answer could turn out to be what, in recent years, has become a familiar refrain: global warming. In the first study of its kind in the state, a biologist with Audubon California will crunch a vast amount of data over the next few months to learn whether some 400 bird species are shifting their ranges in response to climate change.

"We're looking historically at how species have been responding to changes in climate across the state," said Bill Monahan, a biologist who recently joined Audubon California in Emeryville. "An extension of that is looking forward: How are they likely to respond to future climate change?"

Instant predictions

Monahan, the latest of a number of scientists to take up the issue of warming-driven animal movement, hopes to produce a computer model that would allow scientists, and the public, to create tailor-made predictions of changes in bird populations.

Just punch a location and date into a Web site, and the model would spit out a forecast for a variety of bird species throughout California.

To do it, he'll rely on two databases that go back as far as 40 years. One is the collected observations during Christmas bird counts held by Audubon since 1967. The other is the breeding bird surveys performed around California by the U.S. Geological Survey.

The idea is to search for definitive evidence of an effect scientists believe they might be seeing among many species worldwide.

As the planet's overall temperature rises, many animals and even plants appear to be moving north to higher latitudes or up to higher elevations.

"This is a booming field," Monahan said. "Certainly, these sorts of studies and models are being used across all sorts of taxa (species groups) around the world."

Clearing the climate picture

The trick will be to tease out the effects of climate from other factors that muddy the picture and that could be driving animal movement as well: wildfire, development, human alteration of the landscape. Black skimmers, for instance, might well have shifted their territory northward in response to warming.

Orange County also saw a similarly sudden surge of breeding elegant terns, said Robb Hamilton, a biologist who specializes in bird population studies.

Birders – who form a healthy, vigilant contingent here – noticed that, until 1983, elegant terns would stop over in Orange County only after their breeding season was over.

That year, they began showing up sooner and casing small islands for breeding. Now they breed here in the thousands.

But global warming is not the only possible explanation for the abrupt increases in both species. Orange County nesting opportunities for such migratory, water-loving species improved over the years as more wetland areas were protected and nesting islands created.

"Was it just that we were creating new habitat for them?" Hamilton wondered. "Unless you do the systematic sort of study like the one being done now by Audubon, it will always be open to question exactly what caused that to happen."

If a broad-scale pattern of bird movement linked to a period of climate change can be shown across the whole state, it would be far less likely to be due to localized, unrelated factors.

Another problem is climate change itself. Its effects across the planet are patchy and uneven.

Monahan says his computer model should be able to predict changes in bird populations according to varying climate scenarios as well as varying geography and periods of time.

Of mice and chipmunks

Other scientists have already seen what they thought were the effects of warming on bird and even mammal species.

In a study published in 1994, the late Ned K. Johnson, of the Museum of Vertebrate Zoology at UC Berkeley, showed that in the late 1950s and early 1960s, 24 U.S. bird species he examined had shifted their ranges.

Four northern species extended their territory south, three eastern species moved west, and 14 Mexican or Southwestern species moved north. The three other species also had less dramatic, but still noticeable, shifts in their ranges.

Johnson concluded that, because these movements coincided with higher summer temperatures and increased summer moisture, they were most likely driven by climate change.

And the work at Johnson's museum goes on.

John Perrine, a wildlife biologist there, concerns himself not with birds but with mammals. He and his research team have seen changes in chipmunks and pinon mice. And he's focusing on different directions: not how they move north or south, but instead, up or down.

"For mammals, things are moving uphill," Perrine said. "Some things are found at higher elevations than they used to be."

If the animals are tracking changes in climate, that would only make sense. Species that thrive in lower temperatures, after all, could move north, but they also could move up a mountain slope.

The pinon mouse – "a good-sized native mouse, with huge ears," Perrine says – used to top out at about 8,000 feet.

In the 1910s and '20s, a naturalist named Joseph Grinnell found this pattern consistently where he encountered the mice in the region of Yosemite National Park.

But in a new report that the team is preparing for publication in a scientific journal, the pinon mice were found at much higher elevations.

"Our team found them up at 10,800 feet, 11,000 feet, up in the subalpine conifer," Perrine said. "A real dramatic change."

The situation is even more dire for one of seven species of chipmunk found in Yosemite.

If your strategy is to move up instead of out, there's a big danger. What if the climatic conditions you require end up moving higher than the very top of the mountain?

"These guys used to be very common back in the 1910s in the Yosemite region," Perrine said of the high-elevation chipmunk, known as the shadow chipmunk. "Now they've functionally disappeared."

Strengthening the link

Perrine and his research team are trying to find out if the same pattern holds true for other species on other mountains in the state. Again, without more examples over a broader area, a definitive link to climate change remains uncertain.

"We cannot say that climate change is the reason for that, but it certainly looks that way," he said.

"We don't know. It isn't definite proof that climate is affecting the species."

But just suppose that global warming is causing black skimmers to bring more delight to birders at Bolsa Chica, or a chipmunk to vanish in Yosemite. Does it matter to the species of greatest concern to us, Homo sapiens?

"Birds are an important part of our community and our ecosystem," Monahan said. "You can have cascading effects. And those cascading effects aren't always known in advance.

"Think of the canaries put down in the mines as indicators, to see if it's safe for humans to go down there. (Other) birds can be indicators as well. We share the same environment."

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tm7designs wrote:

Most obvious cause of the skimmers arrival, late season hurricanes interrupting thier northerly migration. Most birders realizes rare sitings can be attributed to this. However, if climate change is an on going trend, this is excellent evidence.

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