

The Revolt of the Bird-Watchers

On the Scientific Roots of the Mono Lake Committee

An Excerpt From the Book Storm Over Mono

by John Hart

It is a place where the grand processions make you acutely aware of being alive on the planet. You watch the passage of moon, sun and stars over the knife-edged horizons, and the jagged shadows of evening reaching beyond the lake into Nevada and the sky beyond. You watch the birds in their arrivals, departures, and intricate ceremonies and stalking grace, and you take comfort from such order and cyclical permanence. It is hard to watch this spectacle crumble to dust.

—Gray Brechin, 1976

The Ecological Study

Early in 1972, on the Davis campus of the University of California, a student named Sally Judy saw an ad in the student newspaper: “Bird Freaks Unite!” The author, drumming up membership for a student-run birding course, was one David Gaines. Sally Judy wasn’t a bird freak—yet—but she turned out for the course. That casual decision changed her life.

Two years later, Gaines and Judy were a couple and staying at his parent’s condominium in Mammoth Lakes. Gaines, who had just earned his Master’s degree in ecology, was doing a quick inventory of Mono County for the California Natural Areas Coordinating Council. He was instantly captivated by Mono Lake and alarmed by the changes he saw taking place there. Sally, for her part, was not an enthusiast at first sight: “I didn’t see enough of the lake to be impressed.”

In 1975 Gaines was commuting between posts at Davis and at Stanford and talking up Mono Lake to students and friends on both campuses. One of these contacts, Jefferson Burch at Stanford, got word of something amazing: a federal program of research grants for undergraduate science students, called Student Originated



California Gull research on Mono’s islands.

Studies. Why not a study of Mono Lake? With Gaines’s encouragement, Burch and two friends, Christine Weigen and David Winkler, worked up a proposal. To their astonishment, the \$20,000 grant came through.

In 1976, the dozen members of the Mono Basin Research Group assembled in Lee Vining. David Gaines was on hand but not on the official, all-undergraduate roster. Most of the group camped out on a ranch on Dechambeau Creek near the northwest corner of the lake. (Landowner Jan Simis, a member of the local Friends of Mono Lake organization, had the welcome sign out for researchers.)

Looking at the group, you might have pegged them just as local folk certainly did: belated hippies, sixties kids in the wrong decade. In the Dechambeau

encampment they sang, recited verse, lived largely on granola, beans, and rice and were known to take in other nonstandard substances. But if you’d expected no results from such an outfit, you couldn’t have been more wrong.

The study group made an orderly survey of the Mono Lake environment, building from the physical basics to the subject they knew would prove central: the birds.

Flocking to Mono

Though people had long been remarking on the numbers of birds at Mono in summer, no one as far as the students knew, had made a systematic count. (They were unaware of Walter Dombrowski’s waterfowl estimates in the 1940s.) It’s not hard to see why so little had been done. The lake was large. The flocks were vast. Some species spread over the whole lake surface. Others were secretive. All moved around. And why try to count birds at a doomed lake, anyway?

By car, by boat, and on foot, the group carried out five “all-lake censuses.” Heading out at dawn with “mist nets,” they trapped shorebirds. Perching on tufa towers (a practice later frowned upon), they panned binoculars and telescopes over miles of water. Boating

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Researchers crossing dusty alkali flats near Black Point.

to the islands, they inspected the gull colonies on Negit minutely, doing their best not to disturb the birds (spooked gulls will abandon eggs and young, and the neighbors tend to turn cannibal). They skimmed around the lower-lying islets by canoe and gave them names like Twain, Muir, Java, Pancake, and Little Norway.

When the figures were added up, they showed maximum populations, on any given day, of several thousand American Avocets; 22,000 Red-necked Phalaropes; 93,000 Wilson's Phalaropes; and three-quarters of a million grebes. All these totals were more or less surprising. The gull counts, 46,000 birds, with 38,000 on Negit and 8,000 on the islets—were ten times higher than most earlier visitors had guessed. The impressive phalarope counts were completely unexpected. The group also made an important addition to the breeding-bird list: they spotted, for the first time, Snowy Plovers nesting on the remote east shore.

The most numerous species, the Eared Grebe, was an obvious target for close study. But the grebes, who favor open water, floated maddeningly out of reach. "We never caught a grebe," David Winkler recalls, "and we weren't willing to shoot one." The group did make a useful compilation of old grebe knowledge and confirmed Mono Lake as their major habitat in the western Great

Basin, as Great Salt Lake is in the eastern.

The Wilson's Phalaropes were almost as frustrating. By the time the group had mastered its shorebird-netting skills, *Phalaropus tricolor* had headed south from the Mono Basin. That left available for study the Red-necked Phalaropes and the gulls.

By sticking straws down the gullets of captured birds and extracting samples of the stomach contents, the students learned that Red-necked Phalaropes chiefly eat alkali flies—adults, pupae,

and larvae. The students tried to estimate how far these migratory birds could fly from Mono by gauging their fat supply. This can be done by simply killing and boiling up the bird, or more humanely, as they did, through an elaborate computation based on weight and length of wing. The students concluded that the Red-necked Phalaropes left Mono fat enough to make it at least to the Salton Sea and perhaps to the Gulf of California. But they also concluded that Mono Lake was a mere stopover point for this species, not, as it is for the Wilson's Phalarope, a vital last staging area before a heroic flight.

Because gulls regurgitate food for their chicks, it was no trick to check what they had in their crops: brine shrimp. Later research would suggest that gulls, like phalaropes and grebes, do in fact prefer alkali flies when they can get them; the more abundant brine shrimp appear to be the fallback, the staple.

The gull census had shown Mono Lake to have the world's second largest breeding population of the species; only Great Salt Lake harbored more. The group speculated that Mono gulls might be different from other groups of *Larus californicus*, a separate flock returning to this lake only, as salmon strains return to their natal streams. "If the gull colony at Mono Lake collapses," David Winkler



Researchers gather for a lunch break in a spot now covered in water.

suggested, “it will mean the demise of a population which ... is, in all probability, unlike any other in the world.” This idea seemed plausible, but Winkler’s own later work would prove it flat wrong: *Larus californicus* is *Larus californicus*, wherever found.

Before the Ecological Study, Mono was vaguely acknowledged as a lake with a lot of birds. After the study, incomplete as it was, Mono had to be recognized as habitat of the first importance. Over the years this recognition would only grow.

What would continued lake decline mean to these species? Possible problems were loss of nesting sites for the gulls, diminished food supply for all species, and physical stress from intake of salt water.

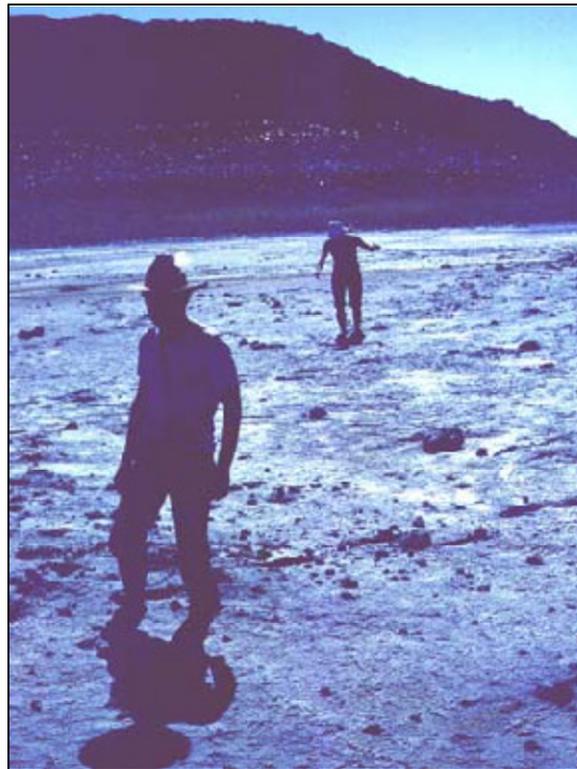
The Negit Island nesting ground would plainly go fast. In September of 1976, with the lake surface at 6,378 feet, the single remaining strait across the land bridge was less than a yard deep. In two years, maybe one, coyotes and other predators would cross. Could displaced gulls find room on the islets east of Negit, or might they move over to Paoha? The researchers couldn’t say. In the long run, though, all existing islands, even Paoha, would be bridged; and though new ones would undoubtedly poke out of the water, the total available habitat would shrink dramatically.

How low can you get?

To assess what would happen to avian food supply, the researchers had to figure out just how low, and thus how salty, the lake would get. Those answers come out of a formula called a water balance. In essence, it is like a personal budget. The lake has a certain natural income, mostly from creeks and from rain that falls on its surface. It has an unavoidable expenditure, in the form of evaporation. It has a bank account, the water in the lake itself. When the evaporation expenditure is greater than the liquid income—as it has been in most years since 1941—the bank account shrinks and the lake falls.

But getting from the simple theory to a practical formula is no easy task. For one thing, most of the numbers, including evaporation rates, are estimates. Only the larger streams are gauged, and the gauges are not near the shore. Every Mono Lake water balance model makes its own simplifying assumptions; every model must be tested against the historical record; every model must be tricked out, in the end, with an extra, arbitrary factor to bring it into line with the facts observed.

Compared to previous efforts, the



David and Sally Gaines make their way through the Mono muck on the land bridge.

Ecological Study water balance, prepared by team member Robert Loeffler of Stanford, was quite sophisticated. Its results, though, lined up with predictions made as far back as 1934 by the Department of Water and Power. It suggested that if diversion continued at the recent clip of 100,000 acre-feet a year, the lake would wind up fluctuating around a level of 6,323 feet, it would have about half of its 1976 surface area, and it would contain less than a third of its 1976 volume. The model foresaw a lake almost four times as salty as it was in 1976 and seven

times as salty as the sea.

How would alkali flies and brine shrimp do in this shallow, shrunken lake? Gayle Dana and David Herbst went to the lab at Lee Vining High School, boiled down lake water to produce brews up to three times as salty as Mono Lake vintage ’76, and put shrimp and fly larvae into them. The shrimp began dying massively as salinities approached double the then-current level of about 88 grams to the liter. Fly larvae did not die but went into a kind of dormancy; at concentrations above double, they seemed unable to move into their next life stage, pupation.

The sensitivity of Mono shrimp was a surprise. Brine shrimp from some other lakes can live in waters so full of salt that any additional chemical precipitates out as a solid. However, these “foreign” shrimp can’t live in Mono water, which is charged not only with table salt but with sulfates and carbonates as well, nor can Mono shrimp live in the “foreign” waters. These and other differences would eventually lead the Mono Lake shrimp to be declared a separate species, *Artemia monica*.

Might Mono shrimp acclimatize to a saltier lake? Dana and Herbst doubted it, and later researchers have concurred. Saltwater creatures, it appears, have just a few methods for getting rid of salt and carbonate; with little natural variation, there’s not much for natural selection to build on.

At what lake surface elevation would concentrations become lethal? The Ecological Study didn’t try to pin this down, but later researchers would put the last-gasp surface elevation somewhere between 6,350 and 6,360 feet above sea level. As it sank toward that range, Mono Lake would be impoverished and probably subject to unpredicted disruptions; below it, the lake would indeed approach the state of a Dead Sea.

Without shrimp, no gulls and grebes.

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Without flies, no phalaropes. Though these bird species would hardly go extinct without Mono, the loss of the lake would be a serious blow. Just how serious remained for later research to show.

The 1976 workers flagged a third threat to the birds: stress on their systems from too much salty water, ingested with their food or in their food, as the body fluids of prey species grew more salty. This idea was to prove controversial; certainly such an effect would set in only when the lake became very salty indeed.

On quite another subject, the 1976 study asked what would happen, over time, to the alkali flats exposed by a falling lake. Would vegetation close over them? Or would they remain barren indefinitely, giving rise to plumes and clouds of dust?

Preliminary studies suggested that vegetation was slow indeed to colonize this flat and poisonous environment, and that dust storms could only get more severe as the alkali rim expanded. “Three months of field work,” the report concluded, “could uncover only the beginning of an answer to the question of how water diversions are going to affect the lake and its basin.” The authors made no outright recommendation but observed, “To maintain Negit with a five-foot buffer zone, no more than 25,000 acre-feet could be taken” per year. That would be only a quarter of what Los Angeles had recently been diverting.

The Mono Lake Committee

One night, staring into a campfire at the Simis Ranch, the Ecological Study group realized they were on the hook. Their study done, they decided, they could not walk away. They would have to do something to prevent the losses they saw coming. They would have to make an attempt to save Mono Lake.

This story has been told, but told

always secondhand. No one seems to have sat before that fire. What we have here is a foundation myth, a metaphor for what indeed occurred, but in a more gradual, less tidy way. Certainly no one in the original student group felt like organizing a campaign. Most of them were headed back to campuses that fall. But four do figure largely in the continuing story of Mono Lake.

Two of the four, Gayle Dana and David Herbst, pursued their interest strictly as researchers. Over the next few years Dana would make herself the preeminent expert on the Mono Lake brine shrimp, and David “Bug” Herbst would become the scientific proprietor of *Ephydra hians*.



David Winkler would follow them into pure research, but first he, with David Gaines, would launch the Mono Lake Committee.

Back at UC Davis, Winkler spent much of his senior year pulling together the Ecological Study results; Gaines helped get them into print at the Institute of Ecology there. Late in 1977, David Gaines and Sally Judy moved to the redwood region of Northern California to serve as naturalists on a Nature Conservancy preserve; Winkler spent a season doing fieldwork for the California Department of Fish and Game.

In November of 1977, when the lake surface was approaching 6,375 feet above sea level, Winkler made another

visit to Mono. There he did something no one could have done in over seven hundred years: traversing the freshly exposed land bridge, he walked to Negit Island. “I didn’t even get very muddy doing it.” The gulls had returned to the ocean for the year, but what would await them in May, when they next came inland to breed?

That was the real “moment by the fire.” Winkler felt impelled to get something going, and “it wasn’t going to happen,” he remembers thinking, “unless we could get David Gaines out of the woods.” He trekked north to the Northern California Coast Range Preserve. Gaines agreed to see what he could do.

But Gaines and Winkler still hoped to be spared the task of founding an organization. Instead, they turned to existing outfits: Lajoie’s Sierra Club Mono Lake Task Force; Friends of the Earth; and the Natural Resources Defense Council. There was a meeting at David Brower’s home. All were sympathetic. But Lajoie was now pulling back from this particular fight, and no other party thought it wise, just then, to take up the Mono cause. They would cheer; they would give advice and even some

money; but they wouldn’t be the ones to pick up and carry the load. There was nothing for it: the new Mono advocates would have to organize on their own. ❖

John Hart is the author of Storm over Mono, the definitive work on the Mono Lake story. He immersed himself in the facts, figures, stories, and waters of Mono Lake to bring the book to completion. He has authored several other books on environmental issues including Farming on the Edge: Saving Family Farms in Marin County, California.