asked all the right questions," a House staffer says. "I would rather have had a really strong scientist again," admits Linda Birnbaum, a dioxin researcher at EPA's health effects lab in Research Triangle Park, North Carolina. But she and others say they're relieved a nominee has finally been chosen.

Noonan must now be confirmed by the Senate. Her "first order of business," she says, "is to get to know the organization." EPA watchers and Noonan both agree she has a lot to learn. Her selection, she says, "is as interesting a choice for me as it is for them."

–JOCELYN KAISER

ECOLOGY

Vanishing Pools Taking Species With Them

Near the end of Noble Drive in San Diego, past a row of condos, the city has erected a chain-link fence to protect a patch of dried mud. To understand why, one must look beneath the surface—or wait a few months. Come winter, the rainy season, this sun-baked plot turns into a pond teeming with fairy shrimp and plants, some of which are on the federal endangered species list.

These unusual species spring to life in rainwater ponds, called vernal pools, that linger until late spring or summer every year before evaporating. But strategies to save these ecosystems are falling short, according to new data presented last month at a joint meeting of the Ecological Society of America and the American Society of Limnology and Oceanography in St. Louis. Surveys suggest that up to a third of vernal-pool crustaceans thought to have existed in California in the mid-1800s have gone extinct. "It's death by 1000 small wounds," warns ecologist Gordon Orians of the University of Washington, Seattle. "If we were to lose just one pond or one species, would it matter? Probably not. But the first one goes. Then, the next. And the next. Finally, the cumulative effect on biodiversity is devastating."

Going, going ... Ecologists hope to save this vernal pool at Miramar and *L. packardi* shrimp *(top)*.

LARRY SERPA

ELLEN BAUDER

The crustaceans are dwindling because the pools themselves are a vanishing breed. It is hard to track the ephemeral habitats, formed when rainwater collects in depressions lined with thick clay. But historical soil surveys in California's Central Valley suggest that a century ago, vernal pools occurred on 1.64 million hectares in this region alone, says Bob Holland, an ecologist who contracts for state agencies. Now, the pools return to less than 400,000 hectares in the valley, he says. Fueling the decline are development and agriculture, says Ellen Bauder, an ecologist at San Diego State University. In San Diego, she says, over 90% of vernal pools spotted in aerial photos 70 years ago no longer come back.

For years, hardly anyone noticed the pools were disappearing—until scientists started counting species. Bauder first documented the decline of vernal pool plants, 13 of which are now endangered. Then in 1992 and 1994, a team led by biologist Marie Simovich of the University of San Diego sampled vernal pools in San Diego and throughout the Central Valley. They tallied 80 crustacean species, many existing in only a few pools. Losing these crustaceans could have ramifications up the food chain, says Simovich. Fairy shrimp, for example, are eaten by mallards and other migratory birds that winter in California.

Plugging vernal pool loss and Simovich's numbers on species range into a computer model that forecasts extinctions, Jamie King of the Environmental Protection Agency in Annapolis, Maryland, has estimated that up to a third of the crustaceans that lived in the Central Valley's pools 150 years ago have since gone extinct. "Given that most crustacean species occur only in a few pools, you don't have to lose much habitat before you lose a lot of diversity," King says.

Hoping to thwart further losses, the U.S. Fish and Wildlife Service in the past year has bought two San Diego tracts with vernal pools and says it plans to buy more. The city itself is guarding some pools, including the one on Noble Drive. And Miramar, the Marine Corps Air Station just outside San Diego, has hired contractors to restore 116 vernal pools on its 9300-hectare base—an anticipated 5-year, $1 million project that will involve, among other things, sculpting depressions and stocking them with fairy shrimp, plants, and other vernal species.

But conservation strategies on private lands—which aim to create an equal amount of vernal pool habitat for that destroyed—are bogged down in disputes. Some landowners complain about regulators spying on private property in the hopes of catching citizens filling in mere puddles. "It's a nightmare," says Bruce Blodgett, director of national affairs for the California Farm Bureau Federation in Sacramento, who worries that farmers could lose cropland to restored vernal pools. Scientists decry the strategy for another reason: "This 'no net loss' approach ignores the fact that some fairy shrimp species live in one pool but not in another," says Simovich, who wants to see pools with rare species conserved, not re-created. "The conflict," adds Bauder, "is getting worse."

–KATHRYN S. BROWN

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ORIGIN OF LIFE

Did Twisty Starlight Set Stage for Life?

In their quest to trace the origins of life on Earth, scientists keep confronting a puzzle: How did vital molecules get their distinct twists? Nearly all the amino acids in proteins are "left-handed" (L), a designation for one of two mirror-image configurations of atoms around a carbon center. On the other hand, the sugar backbones of DNA and RNA always spiral to the right. This uniform handedness, or homochirality, could have arisen in the course of evolution, either by chance or because such shapes somehow aid DNA replication or protein synthesis. Or it may have preceded life: Some researchers argue that our infant solar system was seeded with L amino acids formed in cool interstellar clouds, which then rode to Earth aboard comets, meteorites, and dust.

That scenario receives a boost this week with a report on page 672 describing the first evidence of a possible space-borne mechanism. A team led by Jeremy Bailey of the Anglo-Australian Observatory near Sydney has spotted circularly polarized infrared light—in which the electromagnetic wave rotates steadily—streaming from a region of intense star birth in the Orion Nebula. Ultraviolet (UV) light polarized this way can selectively destroy either left- or right-handed (D) amino acids, depending on the direction of spin. If similar radiation bathed the dust around our newborn sun 5 billion years ago, says team member James Hough of the University of Hertfordshire in Hatfield, England, "it could have created the necessary precursors to life's [handedness]. This process would produce a much higher excess [of L amino acids] than anything that could occur on Earth."

The findings are "quite exciting," adds organic geochemist John Cronin of Arizona State University in Tempe, who has found a surplus of L amino acids in two meteorites