

RESULTS

The San Diego County Bird Atlas led to discoveries on many levels, from species new to the county to new insights in ecology. I hope that I have only opened the door to further discoveries. Many types of analysis of the atlas data remain possible but still to be done.

NEW SPECIES

Because San Diego County had a long history of bird study before the atlas period, the only species new during the period were four vagrants, the Yellow Rail, Upland Sandpiper, Belcher's Gull, and Northern Wheatear, and one pioneer, the Brown-crested or Wied's Flycatcher. Twenty-nine species have been added to the county list since the 1984 publication of my earlier *Birds of San Diego County* (Table 5). Of more relevance to our atlas effort were the 11 species confirmed nesting in the county for the first time from 1997 through 2001. The Purple Finch, Crissal Thrasher, and Fox Sparrow had been known as regular during the breeding season for some time previously; their breeding had been inferred but not reported before 1997. The Sooty Tern, Allen's Hummingbird, Red-naped Sapsucker (hybridized with the Red-breasted), Brown-crested Flycatcher, Hermit Thrush, Brewer's Sparrow, Summer Tanager, and Yellow-headed Blackbird were new discoveries. Whether they represent pioneers (especially likely for the hummingbird, flycatcher, and tanager) or ephemera only time will tell.

RANGE EXTENSIONS

We found many species in areas where they were unknown previously. Some of this resulted from covering areas that had seldom or never been visited previously by ornithologists or birders. Some areas, like much of Camp Pendleton, had been surveyed for endangered species but not for birds in general. Species whose ranges are extended probably for this reason include the Violet-green Swallow (found breeding at scattered lowland sites and in the Santa Rosa Mountains), Steller's Jay (found resident in several areas of oak woodland far from conifers, especially in southeastern San Diego County), and the Gray Vireo (found wintering in the elephant trees near Alma Wash in the Anza-Borrego Desert). Some extensions resulted from birds actually moving into new areas concurrently with the project. Examples of these are the Purple Finch, found through the breeding season over much of northwestern San Diego County, Cassin's Kingbird, spreading to higher elevations and beginning to show up in the Anza-Borrego Desert, and the Great Egret, establishing new colonies. Some range extensions, like those of the Western Flycatcher, Orange-crowned Warbler, Black Skimmer, and Gull-billed Tern, probably reflect forces acting over regions broader than San Diego County, though facilitated by local habitat changes. Distinguishing among

multiple causes is often not possible or will require further study. Especially interesting are species expanding in spite of habitat loss or a history of population decline; clear examples of these are two new colonists, the Summer Tanager and Brown-crested Flycatcher. The forces governing bird numbers and distributions can easily pull in different directions.

MARGINAL SPECIES

One of the many interesting things about ornithology in San Diego County is that so many species come to a limit of their range here. The east side of the mountains, in a rain shadow, differs radically in biology from the west side. The difference corresponds to a major biogeographi-

TABLE 5 Birds added to the San Diego County list since 1982

White-eyed Vireo, <i>Vireo griseus</i> , 7 June 1982
Mississippi Kite, <i>Ictinia mississippiensis</i> , 18 June 1982
Sooty Tern, <i>Sterna fuscata</i> , 27 September 1982
King Eider, <i>Somateria spectabilis</i> , 3 December 1982
Laysan Albatross, <i>Phoebastria immutabilis</i> , 31 March 1983
Pyrrhuloxia, <i>Cardinalis sinuatus</i> , 26 May 1983
Golden-winged Warbler, <i>Vermivora chrysoptera</i> , 6 October 1984
Tufted Duck, <i>Aythya fuligula</i> , 18 February 1985
Dusky-capped or Olivaceous Flycatcher, <i>Myiarchus tuberculifer</i> , 8 March 1985
Gull-billed Tern, <i>Sterna nilotica</i> , 15 July 1985
Yellow-throated Vireo, <i>Vireo flavifrons</i> , 13 November 1985
Gray-cheeked Thrush, <i>Catharus minimus</i> , 1 October 1986
Xantus' Hummingbird, <i>Hylocharis xantusii</i> , 27 December 1986
Ruddy Ground-Dove, <i>Columbina talpacoti</i> , 12 October 1988
Spotted Redshank, <i>Tringa erythropus</i> , 19 May 1989
Louisiana Waterthrush, <i>Seiurus motacilla</i> , 9 February 1990
Brown Booby, <i>Sula leucogaster</i> , 2 April 1990
Little Bunting, <i>Emberiza pusilla</i> , 21 October 1991
Inca Dove, <i>Columbina inca</i> , 16 February 1992
Lesser Black-backed Gull, <i>Larus fuscus</i> , 22 February 1996
Rufous-backed Robin, <i>Turdus rufopalliatu</i> s, 16 March 1996
Red-footed Booby, <i>Sula sula</i> , 24 May 1996
Violet-crowned Hummingbird, <i>Amazilia violiceps</i> , 3 November 1996
Cook's Petrel, <i>Pterodroma cookii</i> , 13 June 1997
Belcher's Gull, <i>Larus belcheri</i> , 3 August 1997
Yellow Rail, <i>Coturnicops noveboracensis</i> , 16 December 1998
Upland Sandpiper, <i>Bartramia longicauda</i> , 19 October 1999
Brown-crested or Wied's Flycatcher, <i>Myiarchus tyrannulus</i> , 26 August 2000
Northern Wheatear, <i>Oenanthe oenanthe</i> , 18 October 2001
Masked Booby, <i>Sula dactylatra</i> , 30 December 2001
Curve-billed Thrasher, <i>Toxostoma curvirostre</i> , 28 April 2002
Gila Woodpecker, <i>Melanerpes uropygialis</i> , 25 September 2003
Yellow-bellied Flycatcher, <i>Empidonax flaviventris</i> , 28 September 2003
Magnificent or Rivoli's Hummingbird, <i>Eugenes fulgens</i> , 11 October 2003
Manx Shearwater, <i>Puffinus puffinus</i> , 28 April 2004

cal boundary, with many species restricted to one side or the other. The 6500-foot range of elevation in the county leads to much altitudinal zonation, with rainfall increasing and temperatures decreasing with increasing elevation. Several species have disjunct ranges on mountain tops. On the coastal slope, there is also a gradient of decreasing rainfall from north to south. Perhaps as a result of this, several birds reach the southern limit of their ranges in San Diego County. This difference has been accentuated as a result of the difference in water use on either side of the international border. North of the border, water and woodland birds have been able to colonize and spread in the wake of the installation of reservoirs, massive importation of water, and planting of water-loving trees. In Mexico, far less water is available, and it is not used with such profligacy. Species or subspecies reaching a southern limit of their breeding ranges along the Pacific coast in or near San Diego County are the Eared, Western, and Clark's Grebes, American Bittern, White-faced Ibis, Gadwall, Redhead, Band-tailed Pigeon (subspecies *monilis*), Spotted Owl, Belted Kingfisher, Downy and White-headed Woodpeckers, Red-breasted Sapsucker, Willow Flycatcher, Barn Swallow, Steller's Jay, Mountain Chickadee (subspecies *baileyae*), Red-breasted Nuthatch, Brown Creeper, American Dipper, Cactus Wren (subspecies *sandiegensis*), Marsh Wren, Swainson's Thrush, California Gnatcatcher (subspecies *californica*), Dark-eyed Junco (subspecies *thurberi*), and American Goldfinch. Some of these nest very locally or irregularly in Baja California; edges of birds' ranges are seldom sharp. Some of these species' ranges are expanding and may extend farther south in the future. Hardly any birds, however, reach the northern limit of their range here. The Vermilion Flycatcher nests farther north in the desert but not normally so on the Pacific slope. The colonization of a pair of Harris' Hawks marks a tenuous addition to this list.

URBAN ADAPTATION

We commonly think of development and urbanization as detrimental to wildlife, and indeed it is to most. A surprising and growing number of birds, though, are adapting to these artificial habitats. Some, like the House Finch, Northern Mockingbird, Brewer's Blackbird, Hooded Oriole, and Anna's Hummingbird, have long been fixtures of the domesticated landscape. But others have only begun to make an adaptive shift.

Buildings and bridges offer nest sites to some birds like the White-throated Swift and Black Phoebe that were once localized to rock faces. Irrigation leads to lush gardens, then urban runoff, facilitating the spread of birds like the Song Sparrow that prefer more humid habitats. Planting of trees has allowed certain arboreal species to spread into what was once treeless scrub. The most obvious recent beneficiary is the American Crow, a species that nests in dense-foliaged trees. It has spread out of its historic range and increased so conspicuously as to draw the attention of the general public. Eucalyptus trees are

prime nest sites for birds of prey, allowing the spread of those like the Red-shouldered and Cooper's Hawks that do not need wide-open spaces for hunting. The eucalyptus' loose slabs of bark offer niches perfect for Western Flycatcher nests. In the late 1980s Nuttall's Woodpecker started adapting, moving into the city wherever it was landscaped with woodpecker-friendly species like liquidambar, birch, alder, and even agave. This cavity excavator paved the way for two secondary cavity nesters, the House Wren and Western Bluebird. In the late 1980s, I told people inquiring about birdhouses to forget about putting them up in metropolitan San Diego; no native species along the coast would use them. Enough people ignored my advice to make birdhouses an increasing factor in the spread of the House Wren and Western Bluebird. Further adapters can be expected. A pattern is emerging: many arboreal species that can live in a stratum above us people on the ground ultimately adapt to urbanization, while terrestrial and undergrowth species retreat.

Adaptation to the city is even more evident among wintering birds than among breeding species. Lush irrigated vegetation, offering a diversity of fruit and flowers through the winter, has allowed some species wintering primarily in the tropics to extend their winter ranges north. The first such example was the Western Tanager, first reported in 1922. Subsequently it has become annual in small numbers. Other increasing wintering species in this category include Cassin's and Plumbeous Vireos, Yellow, Black-throated Gray, Black-throated Green, and Black-and-white Warblers, Bullock's and Baltimore Orioles, and Summer Tanager. All of these are rare (though now annual), and most occur in native riparian woodland as well as urban parks, but they would be far less regular without the boost of exotic vegetation.

RANGE CONTRACTIONS

Early detection of population declines is a central goal of many bird studies. How to identify changes in populations accurately is a vexed topic in ornithology, difficult but critical to conservation policy. A bird atlas is a tool primarily for detecting changes in ranges, which are likely to lag behind changes in numbers. Much of the use of the San Diego County Bird Atlas will come in the future as our heirs look back to evaluate changes in their own time.

Nevertheless, at least 70 species, close to 15% of San Diego County's bird list, have decreased or contracted noticeably at some point in recorded history. For some, like the Short-tailed Albatross and Peregrine Falcon, the changes happened long ago and may have been halted or reversed. Other declines, like that of the Burrowing Owl, Grasshopper Sparrow, and Tricolored Blackbird, are happening as I write these words. Many changes are due to local habitat loss. Our atlas results demonstrate range retractions to varying degrees as a result of urbanization and habitat fragmentation for the California Quail, Greater Roadrunner, and Rufous-crowned and Sage Sparrows, among others. Colonial species that nest

on or near the ground, like the Tricolored Blackbird and Least Tern, are especially vulnerable. In general, terrestrial and undergrowth species are ill adapted to cope with urbanization, which leads not only to habitat loss and fragmentation but to increased disturbance, proliferation of exotic plants and animals, and an increase in certain predators. The Northern Harrier, Lesser Nighthawk, Western Meadowlark, Grasshopper Sparrow, Horned Lark, and Burrowing Owl are all examples of terrestrial species in decline.

The scale of many retractions is broader than just San Diego County. The breeding range of the Bank Swallow and Swainson's Hawk retracted out of all of southern California, that of the Yellow-billed Cuckoo nearly so. From 1987 to 1994 Sooty Shearwater numbers off southern California decreased by 90%, with an increase in ocean temperature and a decrease in zooplankton (Veit et al. 1996). San Diego County was part of the sad story of the California Condor. Often we see changes resulting from local habitat loss combined with negative forces elsewhere. Species exemplifying this include the Mountain Plover, now only a former winter visitor to San Diego County.

Winter habitat and stopover sites for migrants are just as critical to bird conservation as breeding habitat. Though diminished by more than 90%, San Diego County's coastal wetlands remain important to waterbirds. But their use in the context of the entire Pacific flyway needs continuous monitoring so the functioning of these fragile habitats can be maintained. I hope the winter phase of the atlas will be a first step in addressing conservation of winter habitat. Many spring migrants coming north from the Gulf of California or along the west coast of mainland Mexico use San Diego County, with its comparatively low mountains, as a corridor for crossing those mountains and reaching the Pacific coast. The easiest of the passes, up San Felipe Valley, is now revealed as important a corridor for migrating birds as it was for early human travelers.

The formal designation of certain species as endangered has been critical in slowing or reversing their declines. The Least Tern, Clapper Rail, Bell's Vireo, and Peregrine Falcon have all benefited from this status. The process of listing itself is just a start, the opening of a door, on the road to recovery. Listing helps focus public land acquisition on listed species' habitat and helps guide management in areas already in public ownership. Even if multiple-species conservation plans prove successful, the federal Endangered Species Act, however flawed, remains the most powerful tool for stemming the loss of biodiversity.

Even vagrants can suffer declines, and these can be instructive. Some decreases appear due to the local disappearance of the habitats these migrants select, like the shallow freshwater ponds sought by Baird's Sandpiper. Some decreases appear due to changes affecting populations in the breeding and/or winter ranges, as

with several warblers originating in the boreal forest of Canada—especially the Tennessee, Cape May, Blackpoll, and Bay-breasted. And some decreases are undoubtedly due to both types of factors acting simultaneously, as with the Bobolink and Chestnut-collared and McCown's Longspurs.

ANNUAL IRREGULARITY

Many species of birds are known for their irregularity. Nomadism to take advantage of ephemeral food supplies and to avoid adverse conditions is a part of many species' biology, especially in arid regions. Winter visitors are especially known for their irregularity, some species invading in large numbers in some years, going elsewhere in others. Species feeding mainly on fruit or conifer seeds like thrushes, finches, and corvids are most susceptible to irruptions. Sometimes invasions of certain species coincide, sometimes not. The atlas' five-year term captured one significant invasion year, 2000-01. In that winter, numbers of Mountain Bluebirds and Cassin's Finches were exceptional, a flock of Pinyon Jays, the first in the county in 11 years, drew birders to Lake Cuyamaca, and a couple of Steller's Jays made it to the coast. An even greater invasion, featuring especially the Red Crossbill, Pine Siskin, and Red-breasted Nuthatch, took place the winter before the project started. Thus winter distributions for these species are highly dependent on the time over which the distribution is recorded and on conditions outside the area studied.

Our study revealed irregularity among certain species in which it had not been reported previously. Scott's Oriole, for example, was reported twice as frequently in 1999-2000 than in any other winter of the atlas period. The causes of many examples of irregularity remain to be identified.

Irregularity within San Diego County, as a result of local weather, also emerged from our atlas results. In four of the project's five years rainfall was below normal, but in 1997-1998 El Niño arrived, bringing above-normal precipitation well spread through the season (at San Diego, eighth wettest year since 1851). In the Anza-Borrego Desert birds responded immediately. That winter the White-crowned Sparrow, Brewer's Sparrow, and Sage Sparrow (pale migratory subspecies *nevadensis*) were exceptionally numerous and widespread throughout the desert. Northern Mockingbirds and Lesser and Lawrence's Goldfinches spread into marginal nesting habitat in spring of 1998. But the effect was transitory. The next winter, Brewer's Sparrows remained abundant but Sage Sparrows decreased and White-crowned Sparrows withdrew to oases. The following winter, Brewer's Sparrows took their turn in decline. By the end of the project, in February 2002, San Diego County was in the grip of the driest year in recorded history. In the bleakest parts of the Anza-Borrego Desert, even "common" birds had become rare.

The effects of rainfall variation emerged on the coast-side as well. Poor-wills were reported far more often

in the wet winter of 1997-98 than in the remaining four winters of the project combined. On the coastal slope, the effect was most noticeable in the schedule of breeding. In 1998 many species began nesting earlier in the spring and continued later into the summer than in the other years of the period. Evidently drought compels a contraction of breeding seasons in both directions, not a shift earlier in the year. After the conclusion of the five-year recording period, the record drought of 2001-02 led to pervasive nesting failure—usually failure even to attempt nesting—among birds dependent on naturally dry habitats.

COWBIRDS AND THEIR HOSTS

The invasion of the Brown-headed Cowbird, first recorded in coastal San Diego County in 1911, confronted many insectivorous songbirds with a new threat. Coming at the same time as—and probably as a result of—irrigation, agriculture, and other new types of land use, the cowbird played a major role in the collapse of the populations of several riparian host species. How much was due to cowbird parasitism and how much to riparian habitat destruction are impossible to evaluate since these factors operated in tandem. And the degree of effect on the hosts can be assessed only very grossly, because data on their populations before the arrival of cowbirds are so limited. Nevertheless, when one compares writings from the early 20th century with these species' abundance in the 1970s and early 1980s, it appears that the Willow Flycatcher, Blue-gray Gnatcatcher, Bell's and Warbling Vireos, and Yellow Warbler, at a minimum, suffered steep declines. In the case of the Bell's Vireo and Willow Flycatcher, the areas of decline covered the range of entire subspecies, leading to the formal listing of *Vireo bellii pusillus* in 1986 and *Empidonax traillii extimus* in 1995 as endangered by the U.S. Fish and Wildlife Service. As a result, cowbird trapping was introduced widely for management of the vireo and as mitigation for vireos displaced by developments. The vireo responded spectacularly, increasing through the 1990s by a factor of approximately six. Unfortunately, only for the endangered species was there sufficient data on their numbers before trapping for changes to be assessed. And, unfortunately, this experiment in wildlife management has been carried out with no coordination. There is no central office in charge of tracking how many traps are out, how long they are operated, how many cowbirds are trapped, trends in the return for effort, and how the effort might be made more cost-effective. So evaluating cowbird trapping's general effect is almost as difficult as evaluating the effect of the cowbird invasion in the first place. Countywide, the Blue-gray Gnatcatcher, Yellow Warbler, Orange-crowned Warbler, and Yellow-breasted Chat also appear to have increased substantially over the same period in which Bell's Vireo increased. Yet one of the few sources of quantitative data, a banding station on De Luz Creek in Camp Pendleton, implies a decline of the Yellow-breasted Chat from 1995 to 2001 (Kus and Sharp 2002). Since 1986, the Willow Flycatcher popula-

tion in Camp Pendleton, trapped heavily for cowbirds, has remained static, so the response of various host species varies greatly. If this management practice is to be used efficiently and effectively, better-controlled experiments are needed of the effects of cowbird trapping at multiple scales on all hosts. The future of riparian songbirds along the entire Pacific coast of the U.S. may hinge in part on policy toward cowbirds.

EXOTICS

The introduction and spread of plants and animals outside their native ranges has become an accelerating plague in the age of the globalized economy. Among birds, the House Sparrow was San Diego County's first recorded alien invader, first reported in November 1913. The European Starling was first reported in winter "1948 or 1949" but did not arrive in numbers until 1962-63. These "old" exotics have now passed their exponential growth phase and are likely increasing now only at the rate new development creates new habitat for them.

The "Wild" (actually, self-domesticating) Turkey was introduced at least in 1959 but died out by the early 1980s. Another strain of turkey introduced in 1993 has increased rapidly and spread aggressively, by 2004 almost throughout the county's mountains and foothills—contradicting claims by the proponents of the introduction that the birds would remain in the private ranches where they were released. Another exotic game bird, the Ring-necked Pheasant, is on the verge of dying out, possibly surviving only near De Luz, Guajome Regional Park, north Escondido, and Pine Hills. Other sightings are likely of escapees or males (one sex only) released for hunting on California Department of Fish and Game land at Rancho Jamul and San Felipe Valley. The origin of two species of waterfowl, the Canada Goose and Wood Duck, could comprise both introductions and colonization of wild birds. The spread of the latter has been encouraged by nest boxes installed at Cuyamaca and Santee lakes. Mute Swans may have originated from birds released at the Del Mar racetrack; they have spread as far afield as Fallbrook and Lakeside.

A new wave of exotics has begun arriving from the south, escapees from captivity brought in from Mexico or flying across the border. The Red-crowned Parrot is the best established, reported in increasing numbers through the 1990s in Ocean Beach and El Cajon, then spreading from there elsewhere in metropolitan San Diego. Successful nesting was confirmed in both the Ocean Beach/Point Loma area and El Cajon beginning in 1997. The similar Lilac-crowned Parrot is less numerous but also confirmed nesting beginning in 2000. The Red-masked Parakeet, a native of southwestern Ecuador and northwestern Peru, is also proliferating in the beach areas. Several other parrots were recorded over the atlas period but were less certainly breeding.

The Tijuana River valley is the front line for exotics. Black-throated Magpie-Jays and Northern Cardinals are

both nesting in small numbers there, and a group of the former has settled in Bonita as well. Telling what Mexican species might be reaching San Diego as natural vagrants rather than escapees has become almost impossible. Sightings of the Painted Bunting, Gray Silky-Flycatcher, and Black-backed Oriole lead to more questions than answers. Just as with human immigrants, birds from not only Mexico but all over the world may reach San Diego by this route, as suggested by a Rufous Treepie (*Dendrocitta vagabunda*), a native of southern Asia, on Otay Mesa. We recorded all escapees in our atlas databases, never knowing when this year's escapee could be next year's colonizer.

CLIMATE CHANGE

Possibly overshadowing even the effects of runaway population growth on the San Diego environment is the specter of global climate change. Though San Diego, through Scripps Institution of Oceanography, has been at the forefront of research on this issue, the effects of climate change on the local environment have been little discussed. Global warming is being expressed in San Diego County, as over much of the North Temperate Zone, by an increase in winter low temperatures; summer temperatures as yet show no clear trend here. Since 1914, the average January minimum temperature at Lindbergh Field has increased at an average annual rate of 0.041 degrees Fahrenheit per year or 3.67 degrees total from 1914 to 2002. Although cities generate their own warmth, which might be thought to account for this increase, the temperature increase appears even steeper at higher elevations, in areas of minimal development. For example, from 1949, the earliest year on record, the average January minimum temperature at Cuyamaca has increased at an average annual rate of 0.089 degrees Fahrenheit per year or 4.83 degrees total from 1949 to 2002.

Thus the effect of climate warming is most likely to be seen in winter visitors and year-round residents than in summer visitors. Winter visitors and year-round residents may spread upslope, as the House Wren and Cassin's Kingbird are doing. Some species at the northern end of their winter range may increase, as the Barn Swallow is doing. Winter visitors from farther north may decrease or even fail to reach San Diego County at all, as migrating so far south becomes unnecessary. Possible examples of these are the White-winged Scoter, Purple Finch, Bohemian Waxwing, Bonaparte's Gull, and migratory subspecies of the Horned Lark (Patten et al. 2003).

Because climate warming is still in an early stage, the winter phase of the San Diego County Bird Atlas is all the more relevant as a standard for gauging future changes.

Nevertheless, summer visitors are far from immune, though no changes due to climate warming are obvious among them in San Diego County yet. A shift in the time of peak abundance of their insect prey could throw their food supply out of phase with their migration schedule, as has been found for the Pied Flycatcher (*Ficedula hypoleuca*) in the Netherlands (Both and Visser 2001).

A decrease or more irregularity in rainfall is also a great concern in an arid region like San Diego County. From 1997 to 2002, we saw how birds respond to swings in rainfall. Longer droughts could eliminate some species at the margins of their ranges, especially in the Anza-Borrego Desert. Shorter wet spells could give them insufficient time to repopulate, resulting in permanent contraction of ranges. The effects of longer droughts could be indirect. The pines of San Diego County's mountains have already been stressed enough by drought that some have been killed by bark beetles. Many trees of other species of conifers have died from insufficient water. Drought also leaves vegetation more susceptible to fire, an inevitable force in San Diego County's chaparral-dominated landscape. After a fire or beetle epidemic, drought could leave the forest unable to regenerate itself. By promoting fog drip and retention of water in the soil, forests often maintain the conditions that make their own growth possible. The birds inhabiting these forests could see their ranges reduced. Those that are in low numbers or at the southern tip of their ranges in San Diego County, like the Spotted Owl, Saw-whet Owl, White-headed Woodpecker, Olive-sided Flycatcher, and Brown Creeper, are the most likely to be affected.

In the firestorms of 2002 and 2003, 24.8% of San Diego County's area covered in natural vegetation burned—19.9% of the county's total area. The effect of fires on this unprecedented scale cannot be predicted, but the San Diego County Bird Atlas stands as a benchmark against which the recovery from these fires can be gauged.

One of the greatest calamities that global warming may induce is an increase in sea level. A rise of just a few feet would eliminate San Diego County's coastal wetlands. With development crowded up to their edges, there is no opportunity for these habitats to shift inland, as they could during past climate cycles. A rise in sea level would be even more disastrous to all of San Diego County's coastal water birds than it would to its human inhabitants.