

RELATIONS BETWEEN MAN AND BIRDS IN CALIFORNIA

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The interrelations between man and birds have become numerous and varied. Birds of some kind or another occupy all portions of the earth inhabited by mankind, so that it is literally true that man is never without his bird associates. Birds are active by day, and attract attention by their size, coloration, voice, or movements, whereas many other living creatures are less conspicuous because of their small size or retiring habits. Birds therefore constitute a normal part of man's environment, and their relations to him are in general as intimate as those of any other living creatures. It may prove of interest to analyze these relations, especially as they apply to mankind and birds in California.

The interest of the Indian in birds was highly utilitarian: He regularly levied upon such species as afforded him material for food, bodily covering, or adornment. In his elementary state of knowledge, lacking scientific explanations for the true causes of natural phenomena, he attributed supernatural import to certain large or conspicuous animals and birds—witness many of the legends of our native Indians.

As the human race has proceeded in mental development, its interest in birds and relations with them have become more intimate. The leisure which has come with bettered efficiency, through the invention of labor-saving devices, has allowed opportunity for cultural advance, with development of other interest in birds. We may now recognize that birds are of importance to human society (1) for esthetic reasons, the observation, study, and appreciation of birds giving pleasant and intellectually profitable employment to our leisure, as is indicated by the host of bird students among Caucasian populations; (2) as food for persons far removed from settled communities and for certain native races; (3) as objects of pursuit for sport, a manifestation of the primeval necessity for providing food, now more or less sublimated into a contest in which the hunter, especially he of true sporting caliber, pits his skill against the natural efforts of birds toward self preservation; (4) by reason of competing with man for the results of his labor and effort in agricultural operations, where closely spaced crops of plants, producing materials acceptable as food for birds, are grown in new areas or as replacement for native plants; and (5) as agencies in the dissemination of disease.

Our historical record does not indicate the effect of the Indians on their bird associates, but there is little if any information to show that they ever seriously altered the populations of wild birds. The weapons used were relatively crude; but, more important, the Indian population was never large, because of the limitations imposed by warfare, disease, and periodic food shortage. Merriam and Kroeber indicate the Indian population of California, a century ago, as not exceeding 260,000, which is to be contrasted with about six million human beings, or 23 times as many, in California at the present time.

Early travelers in America, east or west, commented on the large populations of native animals—rodent, ungulate, and carnivore among mammals, and of quail, ducks and geese, waders, hawks, and other large and conspicuous birds. Lacking definite information we may infer that in early days small birds were present in numbers appropriate to the food supplies and habitats then afforded.

An early conspicuous activity of "civilization" in California was the killing of birds for food. The early newspapers, the written accounts of early naturalists and settlers, and the verbal statements of old-time residents all attest the number and

variety of wild species which were available and which were taken for food and offered for sale in markets. Although statistics are scarce, the scattered evidence indicates that an enormous commercial traffic existed for upwards of 60 years, being checked by law only when evidence for depletion was overwhelming. In fact, hunting of wild game for market purposes was legal until 1915, and is even practiced today outside the law.

No particular criticism can be attached to those who early engaged in these practices, although a more enlightened consideration might have been expected near the turn of the century when the disastrous effects of overhunting, lengthy seasons, and sale of game were becoming evident. The enormous draft on the wild species, despite their seemingly limitless ability for replenishment, eventually has shown its effect, particularly with better weapons, improved facilities for reaching hunting grounds, and the larger hunting population. The right to hunt game freely and easily has been considered an almost inalienable part of the birthright of every citizen in America. The drain on wild game continues, with nearly a quarter of a million licensed sporting hunters in California alone. Artificial methods for replenishment of the game bird supply now occupy an important fraction of the energy and funds of official and private agencies in attempts to build up and maintain stocks adequate to hold the interest of hunters to the point where they will continue to expend money for licenses, guns, ammunition, and other sporting paraphernalia. Market and sport hunting has, however, been directed at only a limited part of the bird population. The majority of bird species of smaller size have never been considered as game by our hunters, although levied upon to a limited extent by small boys and by aliens from countries where the term "game" embraces a wider range of species than in America.

Occupation of California by the white man has altered the conditions for existence of wild birds by changing the environment in ways both favorable and unfavorable. Most bird species are relatively inflexible in their habitat requirements. It is axiomatic that the habitat is more basic than the occupant. In a given ecologic complex only certain species can exist successfully; if the habitat is altered, the bird complex changes. Man's alteration of bird habitat has consisted of deforestation; of removing chaparral and other shrubby growth; of afforestation on barren areas; of planting trees, vines, herbaceous plants and grasses in close spacing over extensive areas, in substitution for forest, brush, or grassland; of the drainage of swamp lands, river bottoms, and lakes; of the husbanding of stream and winter flood waters in reservoirs to be applied as needed to crop lands; and of the carrying of irrigation water to lands originally desert or semi-desert in character. All of these measures have resulted in alteration, elimination, or substitution of bird habitats. This statement applies not only to unsettled regions and to farm lands, but to urban areas as well, where houses, with their decorative trees, shrubs, and vines afford substitute nesting habitats, and where the plant cover gives new forage habitats and food supplies.

Specifically, the removal of forest trees eliminates the strictly forest-dwelling birds such as woodpeckers, creepers, warblers, nuthatches, and glade-nesting thrushes. A new successional cycle of plants is initiated; in the Sierras of California this seems to involve in turn brake, blackberry, chaparral, deciduous forest, and probably only after all of these a return to the original coniferous forest climax. Fox sparrows, green-tailed towhees, and mountain quail are favored in the earlier stages of this altered condition. Clearing of chaparral from foothill areas removes cover for Bell sparrows, wren-tits, and California thrashers. Removal of blue oaks takes the nest-

ing habitats of gnatcatchers, bush-tits, plain titmouses, bluebirds, and California jays. Replacement of native foothill plants by orchards or vineyards may offer substitute nesting places for valley quail and mourning doves.

Linnets are accommodated by orchard trees for nesting. Flat open valley floors or plains once covered by grasses and herbs—the original forage areas of elk and antelope—were also tenanted by other, smaller mammals, and among birds by meadow larks and horned larks, besides being the winter forage grounds for geese, cranes, mountain plover, and other species. Planting of a seasonal crop of cereals on these areas still affords appropriate habitat for such birds, with enhanced forage potentialities for them and for other species as well. Development of deciduous fruit orchards on lowlands and in foothill areas has afforded supplies of moist, pulpy fruits in the long, dry summer season for linnets, grosbeaks, mockingbirds and orioles, and of buds serving in part as winter and spring forage for linnets and purple finches and, locally, of the crowned sparrows. Nut-bearing trees provide seasonal food crops locally for crows and certain woodpeckers. Young vegetable plants, notably lettuce and beans, provide acceptable forage for linnets, horned larks, and crowned sparrows, while the early stages of certain garden flowers such as sweet peas, delphinium and stocks are eagerly taken at times by wintering populations of crowned sparrows. Berry-producing trees and shrubs supply new and increased forage for robins, bluebirds, thrushes and waxwings. Lessening the number of predatory mammals releases pressure on certain birds, while rodent control removes the normal food supply of hawks and owls.

Commercial plantings of field and truck crops, vines, and fruit and nut-bearing trees have been subjected to attack by birds from the early days of agriculture in California. The interpolation of an increased food supply, especially through the dry summer season, has, to use a stockman's expression, "increased the carrying capacity of the range", for birds. In the Imperial Valley the bringing in of irrigation water has transformed portions of a dry desert into an area for intensive production of grain, pasturage, and green table vegetables. This has enormously increased the forage possibilities for blackbirds, horned larks, linnets and, in winter, for ducks. The planting of a hundred thousand acres of rice with attendant cat-tail growths along canals has greatly enlarged the forage and nesting habitat available to blackbirds. The placing of irrigated orchards and vineyards on dry plains in the lower San Joaquin Valley has improved opportunities for mockingbirds where once lived horned larks. In the lowlands, development of artificial grassland, namely lawns, and of orchards repeatedly irrigated, has provided summer forage areas for the robin, and this species has, locally, become a member of the lowland summer avifauna within the past two decades. In many places the local populations of birds at nesting time, and in winter as well, have been augmented by the altered forage and shelter resulting from man's intervention.

In some places and at certain times the competition by birds for agricultural products has assumed serious proportions. Efforts at checking this competition date at least from the 80's. On some areas damage of serious nature has occurred only at long intervals, whereas in other places it has been of regular occurrence. The means employed to combat this damage have been as varied as human ingenuity could devise. Screening by cloth or wire, use of scarecrows, small windmills, poisoned water or food, as well as the provision of fresh drinking water, and the planting of counter-attractant crops, have all been tried.

Many individual records have been published of birds killed by poisoned cereals distributed to control ground squirrels, but that such deaths occur in numbers suf-

ficient actually to alter permanently the local populations of the bird species concerned has not been demonstrated as yet.

Use of chemical poisons to combat insect competitors for agricultural products has restricted in some degree the potential forage of insectivorous birds and, at times, has resulted directly in the deaths of birds. Closely planted field, vine, and orchard crops present potential forage area for the growth of large numbers of insects, but persistent and extensive spraying and dusting with chemicals keeps many of these species within narrow limits. Nocturnal fumigation of citrus trees with hydrocyanic acid gas under tents to control insect pests results in death of some birds. Orchards in general by reason of control operations do not afford the birds insect forage comparable with the amounts on native or unguarded trees.

The repeated pruning of trees and vines results in artificial conformation of open character suited to easy tillage and the early ripening and easy harvesting of fruits, but does not permit these plants to assume the dense, well-shaded growth forms best suited to nesting harbor for many species of birds.

Clean cultivation of fence margins, field corners, and roadsides, as practiced primarily against alien plant species—weeds—to reduce the competition with crop plants and to restrict available hosts for fungous diseases and insect pests, incidentally goes far in restricting the seed crops of these plants which otherwise would be available for finches, sparrows, and other surface-gleaning birds.

Telephone, fence, and other poles afford substitute perching, and in some instances nesting, places for hawks, shrikes and kingbirds, replacing scattered trees formerly used. Trees about farmhouses and in towns give greater harbor for linnets and the introduced English sparrow, while farm buildings and bridges have probably increased the total available nesting sites for cliff and barn swallows.

Oil pools originally occurred in a few localities and served as death traps for a variety of birds. Development of the petroleum industry has increased the number of such pools, bringing some increased danger to birds. Oil wells along the ocean front and the pumping of oil-laden ballast water from tank steamers returning to our ports for a time caused losses among sea birds, but this menace is now largely eliminated by splendid cooperative effort on the part of the oil distributors, at the suggestion of bird-protective organizations.

The control of surface water by man in California has grossly altered the available habitats for many birds. Originally the Sacramento-San Joaquin Valley had vast areas of "swamp and overflowed lands", where winter flood waters remained to evaporate or drained slowly into the rivers, but meanwhile afforded extensive aquatic and semi-aquatic habitats. These are now far reduced in area. Levees now restrict winter flood waters to river channels or by-passes, resulting in rapid runoff to the sea. Several major lakes were present, including Buena Vista, Tulare, Lower Klamath, Tule, Goose, and Honey lakes. All of these save one are now dry, and several minor lakes are gone as well. Climatic pulsations have combined with agricultural practice in bringing about these alterations. Irrigation does not duplicate original conditions with respect to necessary water relations for certain groups of birds. Large acreages of cat-tail and tule swamps and of tree growths along or near water courses and lakes have disappeared, thereby reducing in amount the breeding places for ducks and herons. Although substitute growths of tules and of small trees occur along many irrigation canals, the total acreage of such habitat has obviously declined. The Salton Sea has afforded an alternative habitat for small numbers of a few species. Irrigation and hydro-electric reservoirs do not often afford

appropriate or adequate substitute habitat for palustrine birds. The ponds of duck clubs, earlier of intermittent character, are now being placed on a permanent basis in an attempt to increase the available habitat in which ducks may nest.

The rate of change in conditions for bird species has varied in different localities and habitats. In some instances, as with clearing, the alteration has been slow, but in the aggregate involves considerable areas. Changes in water relations, especially in respect to annual crops has been more rapid, as with development of rice growing in the Sacramento Valley where large acreages were transformed from barley fields to flooded rice checks within a single year, bringing immediate alteration in the habitat and consequently in the species of birds accommodated.

Legal protection of one sort or another has been accorded most species of birds for many years. A few have definitely been denied this protection, including the English sparrow, California linnnet, crow, black-billed magpie, bluejays, blackbirds, shrike, horned owl, sharp-shinned, Cooper and duck hawks, and more recently the white pelican and the cormorants. None of these seem definitely to have suffered in numbers because of this lack of legal protection, despite campaigns which have been directed against certain of them. Numbers, habits, adaptability in ecologic requirements, success in rearing broods under adverse conditions and other factors play different roles with these species in their success in thus surviving the legal ban. On the other hand, the broad-winged group of hawks has declined, despite legal protection, chiefly because their natural habits place them where easily shot by ranchers, sportsmen, and Sunday shooters acting on mistaken premises. A few bird species have been levied upon rather heavily by "oologists."

Introduction of aggressive alien species, notably the English sparrow and ring-necked pheasant, has brought competition to some native species. About dwellings, various native birds would perhaps be more abundant were the English sparrow not present; whether the factor of competition is physical or psychological in nature is not altogether evident. Valley quail would perhaps occupy certain damp bottomlands in greater numbers if not subjected to competition by pheasants. The actual interspecies relations of these two are not yet clearly understood.

The part of birds as disease vectors is too little known to be more than mentioned at present. Whether our wild birds and the domestic gallinaceous birds may exchange parasites is practically unknown here. The spread of animal diseases such as anthrax and hog cholera by vultures has been suggested, and small birds have been mentioned as carriers of fungous diseases of trees, but all information to date seems to show other agencies as more important. The indiscriminate importation of alien birds by game agencies and bird fanciers affords far greater opportunities for establishment of objectionable parasites. Changes in water relations have probably been somewhat of a factor in the western duck sickness now known to be a type of botulinus infection.

In brief, then, the white man has grossly altered certain parts of the avifauna of California in many ways and over considerable areas. A limited number of species have been far decreased, while others have profited notably by human intervention; but there remain many species whose status has not changed, and on vast areas on the deserts, in the foothill country, and in the mountain forests the bird population is in large degree as it was in the time of the Indians, and will doubtless continue in that condition for a long time to come.

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