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## MEN AND BIRDS IN JOINT OCCUPATION OF NATIONAL PARKS

By GEORGE M. WRIGHT

How shall man and beast be reconciled in the conflicts and disturbances which inevitably arise when both occupy the same general area concurrently? As man is at once poser of the question, arbiter in the arguments, and, above all, himself the executioner, his verdict will be determined directly by the use or uses he wants to make of any particular area and the order in importance to him of those uses.

Whatever the designated use of an area, the desired relationships between human and animal occupants are difficult to establish. I believe from observations to date that it is justifiable to state the general proposition that the more man desires to preserve the native biota, the more complex become his problems in joint occupancy.

The opposite extremes would appear at first thought to be exemplified in the business district of a large city and a site that is set aside as a primitive reserve. In the crowded downtown district, nearly all vertebrate wild life disappears. If one of the surviving species causes inconvenience to any ponderable group of the inhabitants, the prime objective of land-use for that site automatically dictates that it, too, must go.

In the instance of a true primitive area, man's estimate of the greatest values to be obtained from the sum total of resources on that area—and by that I mean values for himself, of course, there being no other standard—dictates that he shall impose such restraint upon himself as to shun the area entirely or almost entirely. Because man here, in choosing to forego his share in joint tenancy of the land, side-steps the problem entirely, this is not an adequate example.

Turning to the national parks, we find ideally exemplified the extreme case for which we are seeking, for here the law specifying land-use permits neither the impairment of primitive wild life nor the restriction of human occupancy. At one bold stroke, man has assumed the whole difficult problem in its most complex form, not really as a problem at all, but as a thing accomplished—and all this by high governmental decree.

Section I of the Act of August 25, 1916, to establish a National Park Service says, in part:

The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments and reservations, hereinafter specified, by such means and measures as conform to the fundamental purposes of the said

parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

Countless times it has been pointed out that here was an inconsistency in a first premise; that a lion and a fawn were being asked to share the same bed in amnesty; that ice and fire were expected to consort together without change of complexion; in short, that the vast American public should be brought to the parks for a vacation without disturbance of the pristine loveliness of these sacred areas. A modern Portia, this law-giver:

Therefore prepare thee to cut off the flesh. Shed thou no blood; nor cut thou no less, nor more, but just a pound of flesh.

The National Park Service, springing into being with a thousand exigencies to meet and no time to gaze at the mountain and resolve paradoxes, accepted its charge in the spirit of a Casabianca ready to die for an impossible order. Latterly, however, it has lifted a determined hand to shape a course that will accomplish the seemingly impossible. For, after all, the history of civilization all along the way has been a record of that done today which seemed improbable yesterday, impossible the day before, and not even to be imagined in fools' dreams the day before that.

And so now we find man and animal in joint occupation of the national parks, each armed with his full guarantee of rights. How shall both be reconciled in the resulting conflicts? Where mammals are concerned, the relationships are so ramified and complex as to give pause to the most optimistic worker. Relations between men and birds in a national park, however, are so much simpler that this aspect of the picture is really bright with promise. Some idea of what the problems of birds and men in competition in the national parks are—what is being done to meet them, and what the ornithologist may hope for the future in these last stands of the primitive American wilderness—may be gleaned from the following short accounts of problems that have already developed or are anticipated.

First may be mentioned those situations in which birds are offenders. To date these are few and they should never be numerous or difficult of solution. The reveillés of California Woodpeckers have at times rudely awakened guests of the Ahwanee Hotel in Yosemite, and the resulting complaints were once sufficient occasion for the death sentence. Needless to say, this practice soon stopped. Again in Yosemite, campers' fare left on tables is frequently eaten or spoiled by Western Tanagers or Steller Jays. It may tax the reader's patience to have such trivial matters classed as problems at all, yet it is amazing how many persons will come to sob on a ranger's shoulder begging for justice in the name of omnipotent Uncle Sam and the National Park Service, to wreak stern vengeance on some small feathered "nuisance."

There is one type of complaint against birds in the role of adversaries to man's interests that merits serious consideration. This occurs wherever birds are predatory upon game fish. In Yellowstone, a colony of White Pelicans numbering approximately three hundred birds live upon the spotted trout of Yellowstone Lake and adjacent waters during the breeding season. In many parks, notably Glacier, Yellowstone, and even Sequoia, American or Red-breasted mergansers have been objects of condemnation. In Yosemite, kingfishers have raided the fish hatchery. There are other instances and certainly many more species of birds, including the beloved Water

Ouzel, that take a toll of game fish, but the ones mentioned seem to be chosen targets for the shafts of the fishing fraternity. The reason why, in the opinion of some persons, fish predators as a group stand alone in being inimical to man's interests is obviously that fish constitute the only crop which man harvests in a national park.

The fair principle of give and take shows the way to a satisfactory solution to problems of this type. In return for the special privilege which is his in being permitted to take fish in park waters when the hunter is denied, and even the flower lover must not touch, and also in compensation for robbing the fish-eaters of their normal food supply, the fisherman must be content to restock the stream for the benefit of all. This general policy has been adopted by the Service. In cases of unusually heavy losses, such as occur where a bird or family of birds systematically raids a rearing pond, special protective measures can be devised, or, as a last resort, the individual offender killed, still without altering the status of that species within the park.

In a second category among the conflicting interests of occupation are those in which the park residents and visitors exert an adverse influence upon the bird life. Here we find a more imposing list of disturbances already occurring, with the possibility of others to come. Man with good cause finds it essential to his enjoyment of certain of the parks to employ mosquito abatement measures. The only effective yet economical method so far developed is to spread crude oil over stagnant waters. In Yosemite, a considerable annual toll of bird lives, notably robins and blackbirds, is the price paid, not to mention possible loss of habitats important to some species, and impairment of esthetic values. The loss of bird life could conceivably reach serious proportions in some of the newer park projects, should either draining or crude oil application be resorted to. When the Florida Everglades project is realized, either the visitor will have to bear the discomfiture of mosquito hordes or leave the swamps to the birds. Elsewhere the birds must pay the price, unless some innocuous and practicable method of mosquito abatement is invented.

In Yosemite, in 1928, several Band-tailed Pigeons died from taking poisoned grain set out for rock squirrels around the government barns. This type of difficulty has already been eliminated for all time, since the use of poison is now definitely prohibited within all parks, barring some emergency such as a rodent-carried epidemic of human disease.

Destruction of birds by moving vehicles fortunately occurs but in small degree, though occasionally owls and nighthawks meet death in this way, and at least one Golden Eagle in Yosemite was doomed as the result of striking a car radiator when frightened from the carcass of a deer which itself was an earlier victim of a highway accident. It may develop in the future that some rare and slow-moving bird will have its status definitely impaired by losses occurring in this way. In the mammal world there is the striking example of the gray squirrel colony near the foot of El Capitan. This was apparently the only remaining colony in Yosemite Valley after the great epidemic of 1920, and for a number of years practically all of the potential increase was accounted for as automobile fatalities. Then there is always the possibility of birds flying into wires. No specific instances where this has occurred within a national park to the detriment of any one species comes to mind, but under certain conditions such a complication may arise.

In desert parks, such as the new Death Valley Monument, where the water from a single spring may be vital to a part of the bird life of many square miles, and

where developments to accommodate the influx of thousands of tourists may either preempt or obstruct the original availability of such water, the avian as well as the mammalian fauna will suffer. A little forethought in conserving the water to make it available at places removed from too much disturbance should successfully preserve values which might otherwise be lost.

There are two classes of birds which are definitely unable to tolerate man's presence, at least insofar as joint occupancy of their breeding grounds is concerned. These are colony-nesting birds and large ground-nesting birds. The White Pelican is a striking example of the former. Trespass on a breeding island, if permitted to any extent, may have any one of the following effects: Driving the birds off in the heat of day may result in the "cooking" of the eggs. Prolonged absence from the nests during cold weather or at night will allow chilling of the eggs, with consequent destruction of the embryos. While the parent birds are off, gulls may eat the eggs. Young pelicans congregate in "pods"; if frightened they trample each other in the rush to escape, with many resultant deaths and injuries. If the nesting island is disturbed too frequently, the colony may desert and never return.

The Sandhill Crane is an example among large ground-nesting birds. These birds are so shy that the constant presence of people, such as fishermen tramping back and forth, causes them often to abandon the locality or fail to bring off their young. Only two eggs are laid, and even the sudden rising of the brooding bird when frightened may cause an egg to be kicked out of the nest.

How the difficult relationships involved between park visitors and birds of the two classes mentioned above are being resolved in the minds of students of park wild life problems is seen in the following excerpts from the report of Frederick Law Olmstead and William P. Wharton on the Florida Everglades proposed park:

It is essential that the rookeries be protected from intrusion, be made inviolate sanctuaries for the birds; but experience along the trail has demonstrated that with prevention of shooting and with entirely practicable regulation of public behavior, great numbers of people can be given opportunity to enjoy the sight of amazing throngs of birds at some of their great feeding grounds, and we believe that it will be safely practicable to admit large numbers of people to observation places so related to the rookeries that the still more amazing concentrated flights of homing birds at sunset will pass over them as they return from the feeding grounds.

Where these observation places can best be located and how arranged, how people can best approach them, in what cases by automobile and in what cases by boat, and in general how it can be made possible for large numbers of park visitors to get these and other enjoyments offered by this region, and peculiar to it, without serious defacement of the landscape by artificial elements and also (what is here even more important) without upsetting the extraordinarily intricate and unstable ecological adjustments upon which the whole character of the region depends, is a problem that requires prolonged and intensive study from many points of view by the most competent people—botanists, zoologists, and geologists, as well as engineers and landscape architects. We are satisfied that it can be solved, and well solved; but we cannot too strongly urge caution, thorough study, and patience in the formulating of comprehensive and far-seeing plans before any physical changes, however innocent in seeming, are undertaken.

A third category of problems in securing the desired values from joint occupancy comprises the numerous situations in which man's presence operates inimically to his own enjoyment of wild life values. The relationship sought is one in which the greatest amount of native bird life will be readily accessible to the largest number of visitors over a maximum period of their stay. It becomes evident that birds around develop-

ment centers and along roads and trails have a much higher use value than those located in spots remote and inaccessible. Thus, while the totality of bird life within the park may not be affected thereby, the clean-up practised around centers of human occupation and along roads and as recommended for trails as well, will tend to remove certain species from the very localities where there are the maximum opportunities to see them. Standing trees that are decrepit may have the dead wood pruned or be felled, and dead trees are commonly removed from the vicinities of buildings, camps, parking areas, and roads, partly in the interests of safety as they are potential windthrows, partly as a preventive fire protection measure, partly, perhaps, to augment firewood supply, and very largely, it may be suspected, to satisfy a psychological craving. Tidying up is so personally gratifying, and a tidy park labels an efficient administration! In justice, too, to the one who earnestly tries to please his public, the sensibilities of the city dweller, educated to the concept that a park laid out in the city style is the ultimate in park perfection, must be mentioned as a potent influence.

Yet one standing snag may be worth more than ten or a hundred living trees in supplying the peculiar habitat requirements of certain bird species. In the national parks of California, Screech Owls, Saw-whet Owls, Pigmy Owls, Hairy Woodpeckers, Willow Woodpeckers, White-headed Woodpeckers, Pileated Woodpeckers, California Woodpeckers, Red-shafted Flickers, Tree and Violet-green swallows, Red-breasted Nuthatches, Western and Mountain bluebirds, and Mountain Chickadees are some of the birds that may be affected by this loss of nesting sites and food supply. Crowns bare of foliage are veritable baits for the slower hawks, vultures, Band-tailed Pigeons, and other birds. If the concentration of these birds becomes less along the beaten paths, it is of little avail that they may be more common in the far places. Even the most energetic hikers perforce spend much of their time in camp, and by far the majority of total visitors checked in at the entrance gates never leave the highways and the places where they stop at night.

Nor is this all. There could be recounted an even longer list of birds, this time among the ground- and bush-inhabiting forms, which become increasingly scarce in the very places where people are most apt to see them, in proportion to the effectiveness of clean-up of downed and rotten logs and of brush piles and litter. To list these birds would be superfluous here. Whereas lack of facilities to carry clean-up along roadsides to a logical finish has operated to the benefit of the fauna in the past and hence to the benefit of man in the enjoyment of the park, the future may tell a very different story. With the assignment of Civilian Conservation Corps camps to many of the national parks, and as many as five such camps comprising a total of one thousand men operating in one of the Pacific Coast group of parks, it is necessary that the vigilance of the National Park Service in protecting wild life be redoubled.

Drying up of reservoirs for bird life occurs not only as a by-product of clean-up work. The trampling by thousands of human feet in congested areas destroys the habitat of grassland birds; and so the adverse influences multiply. It will be argued that development areas may, on the other hand, favor an increase of bird life. With many important reservations, this is true, particularly of the public camps. Yet the species favored are usually those aggressive forms so well represented by the members of the jay tribe, whose presence in unusual numbers will, in turn, cause smaller birds to seek a more peaceful life elsewhere.

But this leads out of the field of direct influences of human and bird populations upon one another into the multifold complexities of indirect influences. Re-

search has as yet uncovered next to nothing in this virgin exploring ground, and we cannot even guess what trends in wild life administration for national parks will be indicated when at last the factual basis shall be spread before us.

In review of the foregoing facts and postulations, it is the writer's opinion that the first two categories of problems arising out of joint occupancy (namely, those in which man affects the birds adversely and those in which this order is reversed) include but a few maladjustments and that these will be resolved successfully. The third category, covering those relationships in which man's presence operates to the detriment of man's use of the wild life values, presents many more difficult problems; but their solution is by no means hopeless. A widespread appreciation that the problem exists is the first and most important step. This is already being realized, and the foundations of approach and practice, too, are in the mixer.

Can it be done? As indicated earlier in this paper, in all other fields of science nearly every other triumph has been attained in the face of downright opposition. The Park Service accepts its charge with the cheerful determination that in spite of the shoals ahead the good ship will come to port. The way must be found to reconcile the conflicts arising from joint occupation of the national parks by men and animals without impairment of any major park value.

*Wild Life Division, Office of National Parks, Buildings and Reservations, Berkeley, California; read May 5, 1933, at the Eighth Annual Meeting of the Cooper Ornithological Club.*