

SANCTUARIES OF THE BIRD ISLANDS OF
GREAT SALT LAKE.¹

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GREAT SALT LAKE in the north-central part of Utah is the second largest body of water within the confines of the United States, being eclipsed only by Lake Michigan. It has the highest saline content of any other similar lake. At average level the specific gravity of the water is about 1.13 but this year, since the level has dropped below the lowest recorded mark, the specific gravity has a corresponding increase and now is about 1.2. It is essentially a saturated salt solution and the large square crystals of sodium chloride are being deposited on the sand of the bottom, on the hulls of the boats and on any foreign substance placed in the water.

Ecologically the waters of the lake constitute a physiological desert. No large animals and only a few small forms have been able to adapt themselves to the unusual environment and so far as known no parasites have been able to follow them into the brine. The flora is restricted to one of the blue-green algae (*Aphanothece utahensis*) a few unicellular green algae and a few diatoms. The former occurs in considerable amount and is the principle source of food supply. The most notable organism is the brine shrimp (*Artemia gracilis*) which passes its entire development to sexual maturity in the briny waters propagating parthenogenetically as well as by fertilized eggs. Two brine flies (*Ephydra hians* and *Ephydra gracilis*), have strictly aquatic eggs, larvae and pupae, the larvae having the breathing tube transformed into tracheal gills so that they need not come to the surface to breathe. The masses of floating pupae may be seen as brownish streaks in the water and when they collect along the shores great windrows, often many inches thick, are formed. They are used as food by birds, such as the migrating flocks of Northern Phalarope, the Eared Grebe, California Gull, certain Ducks and others. These extensive collections of fly pupae along the shores are mentioned in the writings of the early explorers and the Indians formerly collected them for food. The gnats, of course, are liberated on the surface of the water and collect in large swarms along the shore and for some distance inward and furnish food for some birds and the common spiders of the region.

The larger islands are arranged in two longitudinal groups. Fremont and Antelope Islands form an extension southward from the Promontory Ridge

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extending into the lake from the north. Stansbury and Carrington Islands are outposts of the Oquirrh range of mountains which extends along the western border of the Salt Lake Valley.

The bird rookeries are on the four smaller islands which furnish nesting sites for Pelicans, Cormorants, Herons and thousands of Gulls. In the order of their size they are Gunnison, Hat, Egg and White Rock Islands. In this discussion the following rookery birds are considered:

Double-crested Cormorant (*Phalacrocorax auritus auritus*), Treganza Blue Heron (*Ardea herodias treganzai*), American White Pelican (*Pelecanus erythrorhynchos*) and California Gull (*Larus californicus*).

Gunnison Island in the northern part of the lake has an area of about eighty acres and harbors breeding colonies of Gulls, Pelicans, and Herons. Because of its position it is the least accessible of the islands but even here the birds have been disturbed by marauding parties. Most boats depart from Saltair, a resort on the shores of the lake, and to reach the island necessitates a comparatively long water trip which because of the briny water and the frequent sudden storms might easily be dangerous.

To reach the island from the west, a long trip around the north end of the lake must be taken, over poor or non-existing roads and over part of the Great Salt Desert. This area extends westward as a great, flat, absolutely barren, glistening expanse of crystallized salt periodically flooded for miles when the wind blows from the east. There is no fresh water in this region.

Hat Island, so named by Capt. Stansbury because of its fanciful resemblance to the hats of that period, is now usually referred to as Bird Island. It has an area of about twenty-two acres and is used by Gulls, Pelicans and Herons during the nesting season. At one time a few Caspian Terns had nests along the sandy shore but they have long since deserted the island. The Gulls occupy most of the area and their nests may be found in every conceivable place; among the rocks, under the sage brush, beside the driftwood on the shore and at the top of the island. The nests are made of sticks, twigs, bones and feathers and because there is a limited supply of nesting material, competition among the birds is keen and the nests are considerably smaller than in other locations where there is an abundance. The usual complement of eggs is two or three.

After the Gulls have occupied their site, the Pelicans collect in nesting communities usually about the mid-portion of the island and place their nests in groups. The nest may be only a shallow depression in the ground among a scattering of sticks, bones, rocks, dirt and excrement, or if on a slope the lower portion is usually built up so as to make the top of the nest level. Two, occasionally three and rarely more, eggs are laid in the nest. The Heron nests are usually on the eastern side of the island where the sage brush is larger. Sticks and twigs are piled into a living sage bush to construct a

platform which may be as high as four feet above the ground. Three or four of the large blue eggs are usually laid.

On Egg Island are found Gulls, Herons and Cormorants and this island has the distinction of being the type locality of Treganza's Blue Heron and the only island on the lake occupied by Cormorants. The island is merely a group of outlying rocks north of Antelope Island and is devoid of all vegetation. It is readily reached by boat or directly from Antelope Island by wading a short distance. Nests of the Cormorants and Herons are similar but the latter are usually larger. They are piles of sticks, bones, brush and mud. Those of the Cormorant are often liberally sprinkled with regurgitated fish, the decomposition of which gives a characteristic if not unusual stench. However, the rains and snows of winter, the hot sun and the brine effect a complete cleansing of the island by the following spring.

In a small lagoon off the northwest shore of Antelope Island is White Rock Island, a large rock with perpendicular sides rising abruptly out of the water. Because of the contour, it is difficult to effect a landing from a boat. Only the Gulls maintain a colony here but some years ago, possibly fifteen or twenty, there were also Herons.

The first descriptions of the birds of the islands and the marshes of the vicinity were made by the early explorers who were impressed by the untold myriads of waterfowl. Fremont visited the delta of the Bear River, September 3, 1843, and repeatedly describes the sound of the flying birds as "a noise like thunder." Capt. Stansbury in his exploration and survey of Great Salt Lake in 1849 to 1851 located and described the islands and was impressed with the numbers of Gulls, Pelicans, Herons and Cormorants. Apparently at that time Hat Island was not occupied as no mention is made of the birds in his journal.

The present cause for alarm is in the persistent and progressive decline in the numbers of these birds with the exception of the Gulls. The other three, the fish-eating birds, have reached the point in the reduction of their numbers when the minimal density is being exceeded and the extinction of the Herons and Cormorants in this location is seriously threatened. The Pelicans on Great Salt Lake have not fared as badly but their position is not secure, especially since the Government gives this bird no protection. They have been destroyed elsewhere and their numbers reduced as at Yellowstone Lake where they feed upon game fish. The total population in the United States has been decreasing and breeding colonies elsewhere abandoned so it may be the present population on the Great Salt Lake has been bolstered up by the remnants of colonies that have ceased.

There can be no doubt but that the Cormorants and Herons are decreasing. Behle has collected all the available data pertaining to this region and concludes that "the Double-crested Cormorants have decreased

alarmingly in numbers from 500 on Egg Island in 1915 to 100 in 1932. Treganza's Blue Herons have been reduced from 400 on Hat Island alone in 1915 to 96 on all the islands in 1932." Last year there were only two Heron nests on Hat Island and not over eighty young Cormorants were reared on Egg Island to the stage where they could take to the water and care for themselves.

The cause of the reduction in numbers is not due to the location. Breeding as they do on islands in the extremely salty lake they enjoy complete protection from all larger organism except man. There are no fish in Great Salt Lake but there is an abundant food supply in the marshes and sloughs at the mouths of the Jordan, Weber and Bear Rivers, the enclosures of the Bear River Refuge and Utah Lake farther to the south. This necessitates the birds flying thirty to one hundred miles from the breeding grounds to the source of food supply but their strong wings are adequate to carry them on their daily foraging expeditions. There have been no epidemics or sickness as has occurred among the western Ducks. Such other factors as increase in natural enemies has not been present and with the breeding range the same as before, the food supply and the feeding areas the same or even increased because of the recent addition of the ponds made by the diking at the Bear River Refuge, the only other seriously limiting factor is the persistent interference of man.

The California Gull has local public opinion in its favor since the summer of 1848 when it fed upon the swarms of mormon crickets (*Anabrus simplex*), that were destroying the first crops of the pioneers. Since then it has learned new feeding habits and regularly acts as a scavenger at the dump heaps, patrols the city streets for miscellaneous material, cleans up the noon-day lunch scraps from the school grounds and has even developed a method of picking cherries from the trees.

The Herons, Cormorants and Pelicans depend upon the fish from the streams and fresh water lakes. The Herons occasionally feed along some of the canyon streams and do obtain some trout and game fish and a few have learned that fish may be obtained at some of the fish hatcheries. This is certainly not the usual procedure and is only the habit of a few individuals.

Nevertheless, the fish-eating propensities of these birds have aroused the enmity of certain fishermen, hunters and so-called sportsmen of the state, who have persistently waged destruction at every opportunity and their work has often been with the knowledge of the fish and game department. The movement has even been encouraged by the furnishing of ammunition for the hunters.

A rookery of Treganza's Herons in a grove of cottonwood trees on the west shore of Utah Lake was totally destroyed a few years ago under such

encouragement. The adults and young were ruthlessly killed and the fledglings left to starve in the nests. The abandoned nests in the trees now stand as the result of the complete extermination of this colony. Other colonies have chosen the rushes about the sloughs and lakes. On several occasions those on Utah Lake have been fired during the breeding season and when visited the half cooked eggs and dead young were found in the burned nests. Not only the Herons but Egrets, Ducks and other marsh birds have suffered by this unwonted destructive procedure. Similar raids by Idaho sportsmen have been made upon the colony of Cormorants at Bear Lake a few years ago, resulting in a large destruction of the eggs and young. Any bird that eats fish is the subject of persecution. On Utah Lake, the small colony of Caspian Terns, the only one in the state, has been raided, all the eggs gathered up and broken against the rocks. Every isolated Heron, standing quietly at the edge of a slough, waiting to catch a frog, a fish or other food is shot at by hunters and fishermen at every opportunity.

Few, if any, birds, especially if gregarious, can withstand repeated molestation and destructive raids during their breeding season, the most vulnerable period in the life of the species. The colony of Cormorants on Egg Island is the only one on Great Salt Lake and probably the only one in the state and last year it was able to produce less than one hundred young to hazard the dangers of the first migration.

Another detrimental factor is the frequent visits of large parties of picnickers such as the one last year that was marooned on Hat Island. On these occasions the Pelicans immediately desert the nests leaving the young and eggs to the devastating effect of the hot sun and the rapacious appetites of the Gulls.

The evidence against these birds has been based upon insufficient facts and faulty reasoning and the hasty conclusion that the fish-eating birds are the cause of the decreasing supply of game fish is entirely erroneous. Other factors as over fishing, stream pollution, illegal methods of fishing, diversion of water, etc., are rarely considered. Behle has conclusively shown, based on stomach analyses and the examination of regurgitated material of adults and young, that these birds are utilizing the slow-moving, non-game fish such as carp, chubs and suckers and that only occasionally can the remains of trout or bass be found. They are thus of distinct economic value by tending to limit the herbivorous carp that eats out the plant food supply and pollutes the water, making it impossible for game fish to live. The carp, especially, has multiplied up to the limit of food supply and as such is competing with Ducks and other game birds for the water plants so necessary for Duck food. Hull considers the Pelicans a great asset in controlling the ravages of the fish in the ponds at the Bear River Game

Refuge. The problem at the Yellowstone is not analogous. There the only fish concerned are trout. It has been shown at Pyramid Lake, Nevada, that as the fish-eating birds decreased, the game fish also decreased. The intermediate factors must be considered in the problem of food chains. Reduction at the top of the chain disturbs the balance and does not necessarily cause an increase at the far end. The intermediate organisms may assume alarming proportions.

A further factor should also be seriously considered. The aesthetic value of large numbers of these characteristic big birds as attractions for recreational, educational, and tourist study cannot be overlooked. The variety and numbers of wild life undoubtedly is a major attraction of the Yellowstone. The bird refuges of the lower reaches of the Mississippi River are already widely known and are attracting visitors. It is possible that these attractive birds as a source of revenue alone, may outweigh the value of the few game fish that they consume. The Bear River Wild Fowl Refuge will be an attraction not only for the propagation of Ducks and Geese but because of the large numbers of other birds that can easily be seen in their natural surroundings. One hundred and eighty-three species have already been listed as occurring on the refuge and fifty different birds might easily be observed in one morning.

It is difficult to get those that formulate the plans and policies of wild life administration to consider much except the exploitation of game or the propagation of species to be used as game. Steps have been taken to bring these islands under Federal control and Hat Island was actually designated as a bird refuge until a revocation of the order was passed May 12, 1930, when it was learned that the island had been patented as a mineral claim because of the guano deposits. These deposits have proved valueless due to the difficulty of their removal and the small amount, most of the accumulation of the summer being washed away during the winter. The same is true of Gunnison Island. Apparently White Rock and Egg Island have never been surveyed. The present owners have raised little objection to the proposition because they have been unable to gather any revenue from their possessions.

The Biological Survey has been repeatedly advised of the condition and has expressed its interest. The proposal along with others has been presented to the President's Committee on Wild Life Restoration by being included in the recommendations recently submitted through the Fish and Game Commission but as yet, no action has been taken. It was hoped that in their proposed setup these islands might be included as breeding grounds of migratory birds on marginal lands of low value. The wheels of the machinery may move too slowly.

The suggestion of making the islands State Refuges could hardly be

considered. It seems inadvisable to entrust the protection to those primarily concerned with game exploitation particularly since, in the past, they have had the opportunity of applying conservative measures but have only expressed passive approval and veiled promises.

Various other agencies are sympathetic with the program and have assured their support. Public backing of a program to establish sanctuaries on the bird rookery islands seems assured. The private holdings are essentially valueless and there should be little difficulty in acquiring them under a federal plan, where they could easily be administered under national control, possibly as a part of the Bear River Project.

In conclusion, may this thought be repeated. The bird islands of Great Salt Lake harboring rookeries of White Pelican, Treganza's Blue Heron, Double-crested Cormorant and California Gull have, with the exception of the Gulls, had a progressive decline in their population, too long continued and too steady to be of a cyclic character so that at present the actual extinction of these birds in this location seems imminent. They have a distinct aesthetic value and economically their beneficial habits outweigh any destructive traits. With the decline of birds in other regions and the necessity for control of numbers, in instances where the conditions warrant it, these islands might be able to maintain a breeding population to preserve the race. It is earnestly recommended that these islands be brought under Federal management as breeding sites of migratory birds.

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