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Abstract: Native egrets (*Egretta* spp.) and herons (*Nyticorax* spp.) maintain rookeries throughout Oklahoma. With the appearance of cattle egrets (*Bubulcus ibis*) in North America, nuisance problems have occurred with the creation and expansion of rookeries near human populations. Egrets and herons, their nests, eggs, and rookery habitat are protected by the Migratory Bird Treaty Act. Damage associated with Oklahoma rookeries are nuisance noise, nuisance odor, potential disease threats, decline of vegetation (guanotrophy), displaced fledglings, and air strike hazards. Proven nuisance rookery control includes habitat alterations (tree thinning), noise harassment with pyrotechnics and propane exploders, shooting to reinforce harassment activities, and nest destruction. Rookery management must give consideration to individuals directly affected, those indirectly affected in the surrounding area, and federal, state, and local governments.

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Key words: *Bubulcus ibis*, cattle egret, *Egretta*, heron, *Nyticorax*, Oklahoma, rookery.

Native great egrets (*Egretta alba*), snowy egrets (*E. thula*) little blue herons (*E. caerulea*), and black-crowned night herons (*Nycticorax nycticorax*) have historically maintained colonial nesting areas (rookeries) throughout Oklahoma. Since the early 1960's, the cattle egret (*Bubulcus ibis*) has increased in population size and has extended its range throughout North America (Baumgartner 1962, Telfair 1983). While benefits of cattle egrets are recognized through their insect-eating activities, nuisance problems occur with the creation of new rookeries and expansion of existing rookeries established by native herons and egrets near human populations. This paper describes egret damage in Oklahoma and our strategies to resolve problems with respect to current laws and public concerns.

LEGAL STATUS

Egrets and herons are covered under the Federal Migratory Bird Treaty Act (Title 50 Code of Federal Regulations). By law, these migratory birds receive full protection along with their nests, eggs, and rookery habitat. Once nests have been constructed and eggs are present, the rookery site becomes a protected area. After the birds nest, they cannot be harassed or their site disturbed. The U.S. Fish and Wildlife Service can issue permits for the take of birds to reinforce harassment and to modify habitats after nest-building. When the egrets leave Oklahoma in late summer or early fall, habitat alterations can be conducted with concurrence from the U.S Fish and Wildlife Service.

ASSOCIATED DAMAGE

Established rookeries can present damage situations especially if the birds are present near human populations. The Oklahoma Animal Damage Control (ADC) program received 37 requests for assistance from the public during fiscal year 1994 (Oct 1993-Oct 1994) to resolve egret/human conflicts statewide. Of this number, 33 complaints were directly associated with rookeries dominated by cattle egrets.

The following damage complaints were reported.

1) Nuisance noise from bird vocalizations and flight activities in the rookery.

2) Offensive odors emitted from accumulated droppings and decomposing birds and eggs at the site.

3) Concerns that rookeries may be health hazards.

Although no transmittable diseases have been positively linked to egrets or rookeries in Oklahoma, psittacosis-ornithosis agents have been isolated from egrets in Texas. (Moore et al. 1959). In 1974, personnel from the Texas Parks and Wildlife Department banded and color-marked egret and heron chicks at 5 rookeries. "Six cases of suspected psittacosis-ornithosis occurred among the 12 men of the banding team. Although positive laboratory confirmation of the disease was not established, 5 members of the team received medical treatment for symptoms of the disease. Serious symptoms lasted from 1 to 9 days, and recovery was complete in all cases. Only 2 of the 6 cases of suspected psittacosis-ornithosis were severe." (Telfair 1983). Accumulated droppings at rookeries suggest a potential environment for *Histoplasma* sp. An Oklahoma ADC specialist was diagnosed with Histoplasmosis after working in an egret rookery in 1992. However, no soil samples were taken at the site for analysis. The same year, a Blaine County rookery was investigated by agents of the U.S. Fish and Wildlife Service and ADC biologists for potential disease threats. Seven cattle egret chicks were collected. Two of the egrets tested positive for *Salmonella* sp. (T. McKay, U.S. Fish and Wildl. Serv., pers. commun.). Egret rookeries are typically infested with ticks (Ixodidae, Argasidae). Active rookeries contain airborne particles of dried excrement and down feathers. Several retired coal miners in eastern Oklahoma living near rookeries have experienced increased respiratory ailments due to airborne

particles (O.D. Scott, Okla. ADC pers. commun.). Appropriate protective clothing, insect repellent, and an approved respirator are recommended for working in or near egret rookeries.

4) Damage to desirable trees and shrubs. Egret activities in rookeries can be destructive to vegetation by the defoliation of plants from bird activity, the covering of leaves by droppings, removal of twigs for nest construction, and potentially detrimental increases in soil nitrates, nitrites, and phosphates (guanotrophy). Plant species that are intolerant of guano deposits (dying within 1-2 yr) include post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), winged elm (*Ulmus alata*), American elm (*U. americana*), black locust (*Robinia pseudo-acacia*), river birch (*Betula nigra*), and pecan (*Carya illinoensis*). Species with moderate tolerance (3-5 yr) are ash (*Fraxinus* sp.), black willow (*Salix nigra*), and common buttonbush (*Cephalanthus occidentalis*). Plants with high tolerance (11-12 yr) are sugar hackberry (*Celtis laevigata*), osage orange (*Maclura pomifera*), chinaberry (*Melia azedarach*), and red mulberry (*Morus rubra*) (Telfair and Thompson 1986). Egrets will continue to utilize available branches for roosting and nesting after vegetation dies.

5) Nuisance situations created by fledgling egrets. As fledglings begin to leave the nests, birds may be found in unusual locations (i.e., yards, streets, highways, under porches, garages, etc.).

6) Potential bird strike. Tinker Air Force Base in Oklahoma City recognizes egrets and herons as a threat to air operations. Routine rookery scouting and egret survey counts are an integral part of the Bird Air Strike Hazard (BASH) program.

CONTROL METHODS

Most Oklahoma rookeries contain 500-20,000 birds. Most rookeries are dominated by cattle egrets. Egrets and herons prefer locations 0.1-5 ha in size, with dense vegetation, for rookeries. In urban areas, suitable nesting habitat may be found in public parks, vacant lots, and other undeveloped properties. Rookery sites can be made less attractive to birds by selectively cutting or pruning trees to open the stand 50-75%. All underbrush should be removed. This work should be conducted during fall and winter months before egrets arrive in spring. Old nests from the previous nesting season can attract egrets and should be removed if possible. Nest removal methods include shooting nests with shotguns or raking with long poles. As egrets begin to migrate to modified rookeries, bird scaring techniques may be required to encourage the birds to move elsewhere. Pyrotechnics and propane exploders can be used effectively before nesting begins. Propane exploders should be distributed throughout the roost or nesting site. Bird activity and harassment efforts should peak just before sunset. Rookery monitoring and bird scouting activities should be continued for several weeks to prevent reestablishment of the rookery, or the creation of new rookeries in unacceptable areas.

In late March, native great egrets arrive to nest, with little blue herons and snowy egrets following soon. Although new arrivals may not present a problem, these birds will attract cattle egrets in April. Because all egrets do not arrive at the same time, during migration into the area, it is not unusual to find new birds that have not been exposed to prior harassment. In cases where the birds become habituated to continual noise, harassment activities can be reinforced by shooting a limited number of birds. A depredation permit is required for take of birds, eggs, or nests.

As the urge to nest increases, egrets will become difficult to move from the area with each succeeding stage of rookery development (nesting, egg-laying, and hatching). Telfair (1983) successfully decoyed egrets to new areas using styrofoam effigies. This method was attempted in Oklahoma but was abandoned because of poor initial success and lack of suitable decoy locations. Oklahoma ADC specialists have experienced success in attracting egrets and herons by mimicking egret vocalizations using open-reed predator calls. Use of smoke as a deterrent has not been pursued due to fire hazards and pollutants. In 1993, helium balloons suspended above the tree canopy were successfully utilized as a visual deterrent in Edmond, Oklahoma. Noise harassment was needed later in the season to maintain balloon effectiveness.

DISCUSSION

Although control methods have been used with great success in Oklahoma, several problems persist. Rookery management is a high-profile operation with intense public scrutiny. Noise harassment activities near human populations are disruptive to egrets and to people. Individuals living beside a rookery welcome management activities, while nearby unaffected persons may take offense. Many local ordinances may prohibit noise, firearms, and other tools necessary to move the birds. Some individuals cannot afford pyrotechnics and/or bulldozing to solve their problem, which forces them to seek assistance from tight-budgeted city and county governments. Because there is only a small window of time (bird arrival to nesting) before the rookery becomes a protected area, many individuals wait until nothing can be done to move the rookery. Combinations of these factors can create very emotional situations for those forced to live with egrets until the birds leave in September. Currently, Oklahoma ADC provides on-site investigation, formulates management strategies for resource owners and many times, acts as a liaison between those affected by egret rookeries and city and county governments.

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