Common Moorhen and young.

Anhinga drying her wings.

Trio of White Ibis (immature) at dinner.

...not even one scientific article reporting bird populations in urban areas.

AmerAquatic Water and Wading Bird Survey

Bird Populations on Golf Courses

"Most native birds cannot survive in these highly-altered, asphalt and concrete environments."

"In the less altered and more vegetated suburbs, a number of native species — Northern Mockingbird, Blue Jay, Northern Cardinal, Morning Dove and Common Grackle — do quite well." — *Florida's Birds, A Handbook and Reference* [5]

BY C. ELROY TIMMER,
VICE PRESIDENT, AMERAQUATIC, INC

These quotes in a reference handbook typify the mind-set of many environmental activists. Their characterization of the golf course as a green desert has been accepted by many in government and the media, and in turn by the general public.

But, is it accurate? There's plenty of evidence that this view is false. *Red-shouldered hawks* scream overhead, a daily sight in Fort Lauderdale. The *least tern* is now nesting on protected rooftops. And it's not uncommon for me to see a falcon consuming a pigeon or a dove in my back yard.

Last winter I took several friends on a birding trip to the Everglades. We did see birds, but my guests would have tallied more species, in greater numbers, in a golf cart.

The dwindling stock of native birds in natural areas (see story, Page 74) has been widely publicized. Have the birds been permanently lost, or have they just relocated? We don't know, but my personal observations of golf courses suggests that urban areas — homeowner lakes, retention basins, drainage canals — have become an important resource for water and wading birds.

How important? After several days cruising the information superhighway, I found not even one scientific article reporting bird populations in urban areas.

No one seems to have considered the question, which gave birth to the AmerAquatic Bird Survey. Our inaugural effort, in February 1994, targeted water and wading birds on golf courses.

We solicited the help of golf course superintendents, asking them for data on the number and area of their lakes, the degree of lake vegetation and their total land area, and to count birds seen in a one morning observation.

For better data consistency, we sought data on only the 14 species listed in Table 2 — somewhat larger, fairly stationary, easy to find and to identify correctly — and provided identification guidelines.

Forty-eight golf courses (Table 1) returned usable surveys. They contained 585 lakes covering 1,258 acres, an average of 12 lakes (26 acres of water) per course.

Despite being full of human activity, these courses were surprisingly attractive to native birds. Observers counted 6,097 individuals of the designated species, an average of 127 birds per course and 4.8 birds per acre of water. Even considering that a February count includes migratory birds, that's a lot of birds per acre.

Migratory birds may be preferentially drawn to golf courses, for several reasons:

1. A generally high nutrient environment. Although we did not gather data on chlorophyll or phosphorus (measures of trophic status), we generally find golf course lakes rather fertile.

2. An ample supply of food, including large numbers of small shad, bream and tilapia, clams and snails (both marisa and apple snails) and some species of non-native fish (particularly tilapia), which have moved into previously unoccupied food niches. And this food is concentrated and more accessible as water levels drop in the wintertime.

3. Small lakes, whose higher ratio of shoreline to water area enhances bird access.

4. Safe roosting sites. Urbanization may discriminate against many bird predators.

Utilization Of Golf Courses

Utilization by species is given in Table 2. (All data are presented in terms of birds per water acre. Hoyer and Canfield's observations by species are also presented as a comparison.)

As expected, *great white herons* and *limpkins* were among the least observed species. The *great white heron*, primarily a salt-water bird, was typically reported only on golf courses near salt water. The *limpkin*, commonly associated with marshes, wooded swamps and wet prairies, was also seen in low numbers.

Some counters went beyond the listed survey species and reported sightings of *bitterns, eagles, ducks, geese, night herons, pileated woodpeckers, sandhill cranes, northern flickers, glossy ibis, American kestrel, Cooper's hawk, red-shouldered hawk, parakeets, belted kingfishers* and more. In a one-hour survey, William Haunders, Jr., a dedicated observer and board member of the 90-acre Kelly Greens Golf and Country Club, recorded an additional 24 species (277 birds, see Table 3, page 75), for a total (including survey species) of 40 species and 573 birds .

Utilization varied widely between individual courses. However, we found no correlation between bird population and lake size, degree of vegetation or any other factor surveyed. We will look further into this variability on next year's survey.

Data Validity

Reporting survey results in terms of birds per water acre may not be wholly appropriate. Gulls and Terns, for example, may just be resting on the course and not utilizing the lakes. Similarly, White Ibis may not be drawn to the golf course for the water. Nonetheless, as they utilize the resource for some purpose, they were included, paralleling Hoyer et al who counted all birds seen.

The accuracy of any survey can always be questioned. Participating golf courses varied in size, maturity and vegetative cover. Counting times were not uniform. Counters varied from novices to experts. There is always the concern that amateur surveyors may mis-identify some species or count some individuals twice.

We did a limited amount of work to confirm counting accuracy, and were also reassured by the fact that both Limpkin and Great white heron were least reported, as expected. On the whole, we believe an undercount to be more likely than an overcount. It is easy to overlook such small, dark or secretive birds as the *little blue heron, green-backed heron, anhinga, cormorant, tricolored heron* and *common moorhen*, and an expert-only count may have been even higher.

Conclusions

Bird counts on golf courses cannot be compared acre for acre with those in Everglades National Park or the water conservation areas. There are substantial differences in topography, habitat and counting methodology.

Neither is direct comparison possible with Hoyer et al, which involved larger lakes. Also, they report the average of observations in three seasons spanning two years. Our single wintertime count is inflated, perhaps substantially, by migratory birds.

Nonetheless, 4.8 birds per acre (at any time of the year) is a lot of birds, and it seems safe to conclude that golf courses are substantially more attractive to water and wading birds than is commonly believed. In fact, the golf course may be more oasis than green desert. Birds have no loyalty to place; they go where they can make a living and many of them, like people, choose golf courses.

How significant are golf courses as a resource?

Extrapolating from a small sample is perilous, but if our respondents are typical, Florida's 1,100 golf courses may support more than 100,000 water and wading birds.

I believe golf courses are not unique in attracting birds; other urban lakes do so as well and their impact could be substantial. If, for example, homeowner and condominium lakes have twice the area of golf course lakes, and urban drainage canals perhaps 3-4 fold more, it would not be surprising to find urban areas providing a livelihood to half a million water and wading birds!

Are birds newly using urban areas, or

Table 1
Participating Golf Courses

Amelia Island Plantation
Boca Lago Country Club
Calusa Lakes Golf Club
City of Jacksonville Beach Golf Course
Collier's Reserve Country Club
Colony in the Wood Mobile Home Park
Cypress Knoll Golf Club
Deer Creek Golf Club
Del Vera Country Club
The Dunes Golf & Tennis Club (Sanibel)
Ekana Golf Club
The Falls Country Club
Feather Sound Country Club
Hibiscus Golf Club
Hilaman Park Golf Course
Hole-In-The-Wall Golf Club
John's Island Club
Kelly Greens Golf & Country Club
LaGorce Country Club
Lucerne Lakes Golf Club
Meadow Woods Country Club
Metro-Dade County's Greynolds Golf Course
Miles Drive Lake (Port Orange)
Naples Beach Hotel & Golf Club
Oak Tree Country Club
The Oaks at Palm Aire
Orangebrook Golf Course
Orchid Island Club
Palm Beach National Golf & Country Club
Palma Ceia Golf and Country Club
The Plantation Country Club (Jacksonville)
Polo Trace Golf Club
Quail Ridge Country Club
Riomar Country Club
RiverBend Golf Club
Riverwood Golf Course
Royal Poinciana Golf Club
Saddlebrook Resorts
Sailfish Point Golf Club,
Seminole Lake Country Club
Spanish Wells Country Club
Stouffer Vinoy Golf Course
Tampa Palms Golf & Country Club
The Deerwood Club
Villa Del Rey Golf Course
Wilderness Country Club
World Woods Golf Club
The Yacht & Country Club

have we just begun to notice them? Are birds emigrating from natural areas to find more food and fewer predators? Has the urban landscape matured, and become more attractive for roosting and nesting?

This survey, limited in scope, can only raise such questions, not answer them. However, our results indicate that the role of urban spaces as a wildlife resource should be reconsidered, especially given the well documented decline of birds in natural areas. We encourage wildlife biologists, ornithologists and environmental studies experts to rise to that challenge.

For 1995

We received many suggestions to improve the survey in 1995, including: counting fewer species (for greater precision); counting more species (to get a better handle on utilization); counting more times per year; using both experts and amateurs, perhaps for parallel counts; including homeowner lakes and drainage canals; and adding mammals (and perhaps fish!) to the list.

We thank our participants for their pioneering effort, and encourage everyone to join them for the 1995 survey.

Editor's Note: *Participation is a must! It is your duty! This kind of information is exactly the type of unbiased information we need to share with the general public so they can fairly judge the issues! Do it!*

Birds In Natural Areas

We constantly hear that the environment (or what's left of it) is degradating. Our time is characterized by "no net loss" of wetlands, mitigation projects and environmental restorations, including such big ticket items as restoring the Kissimmee River flood plan and the Everglades.

Ornithologists are concerned because bird populations (particularly wading birds) are dropping. Wading birds are seen as an indicator of the health of a wetland system. If the food supply drops, the birds simply move.

Everglades, the Ecosystem and Its Restoration[1] states "Most conspicuous and alarming among the biological changes have been the plummeting of the Everglades wading bird populations to less than one-fifth of their abundance during the 1930s."

An Audubon Society publication gave the bird population of the water conservation areas, some 878,000 acres of wetlands in south Florida, as 31,814 wading birds in January, 1993 and 15,132 in February, 19932 .

FOOTNOTES

1. *Everglades, the Ecosystem and Its Restoration* Steven M. Davis and John C. Ogden, Ed. St. Lucie Press, 1994
2. *Wading Bird Population and Distribution in the Water Conservation of the Everglades: the 1993 Season*, G. Thomas Bancroft and Richard J. Sawicki, National Audubon Society.
3. *Palm Beach Post*, June 13, 1994
4. *Bird abundance and species richness on Florida lakes; influence of trophic status, lake morphology and aquatic macrophytes*, Mark V. Hoyer and Daniel E. Canfield, Jr. Hydrobiologia, 297/280; 107-119, 1994
5. *Florida's Birds, A Handbook and Reference*, Herbert W. Kale, II and David S. Maehr, Pineapple Press, 1990

Table 2
Golf Course Utilization By Species
Birds Per Acre of Water

Species	AmerAquatic	Hoyer& Canfield
White Ibis	0.93	0.035
Gulls & Terns	0.92	0.102
Cormorant	0.69	0.039
Common Moorhen	0.47	0.106
Anhinga	0.47	0.044
Great Egret	0.36	0.024
Wood Stork	0.21	0.007
Snowy Egret	0.19	0.001
Green Heron	0.15	0.017
Blue Heron	0.14	0.010
Tricolored Heron	0.12	0.009
Great Blue Heron	0.10	0.023
Great White Heron	0.05	0.000
Limpkin	0.04	0.003
Total	**4.84**	**0.042**

Study says lake area and trophic status principal influences on bird populations

The *Palm Beach Post* recently reported that 5,000 egrets, herons and white ibis nested at the North Palm Beach Solid Waste Authority complex, an urban landfill/resource recovery facility, compared with only 500 in Everglades National Park (1,077,760 acres). It quoted biologist Steve Davis as saying in regards to the Everglades, "Nearly 250,000 birds nested in there in the 1930s. The figure fell to 50,000 by 1976, and its steady drop is continuing. Several species are now considered endangered or threatened."

Recently, Hoyer and Canfield at the University of Florida published a pioneering study of bird populations on 46 Florida lakes totalling 8,408 acres. Bird counts were taken three times (one each in winter, spring and summer) between 1988 and 1990. All bird species (not just water and wading birds) were counted. The average population (for all counting periods) was 0.7 birds per water acre and the highest population was 3.2 birds per acre.

In a statistical analysis, the authors concluded that lake area and trophic status were the principal influences on bird populations. Trophic status (general nutrient level) determined total bird population. Lake size determined species richness (more individual species inhabit larger lakes) but not total population. Lake morphology and aquatic vegetation had no correlation with either species richness or total population even though most birds were observed utilizing near-shore areas where food and cover are most abundant.

Table 3
Birds Sighted at
Kelly Greens Golf Course
One-Hour Survey

Boat-tailed Grackle	52
Blue-winged Teal	42
Coot	35
Cattle Egret	30
Red-winged Blackbirds	23
Fish Crow	18
Palm Warbler	15
House Sparrow	10
Starling	10
Morning Dove	8
Mottled Ducks	6
Spotted Sandpiper	3
Red-billed Grebe	3
Mallard Duck	3
Greater Yellowleg	2
Lesser Yellowleg	2
Red-bellied Woodpecker	2
Glossy Ibis	2
Mockingbird	2
Yellow-rumped Warbler	2
Osprey	2
Flicker	2
Killdeer	1
Belted Kingfisher	1
Carolina Wren	1