

Wetlands and waterbird conservation



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WETLANDS, RANGING FROM TIDAL marshes to the most transitory runoff basins, are of vital importance to many species of North American birds during all or part of their annual cycles. Prairie wetlands produce most of the continent's ducks and provide breeding grounds for many shorebirds, rails, coots, and grebes. Coastal marshes provide habitat for breeding shorebirds, colonial waterbirds, and waterfowl and provide refuge and feeding habitat for vast numbers of migrating and wintering species. Breeding Charadriiformes blanket tundra lowlands. Waterfowl and wading birds winter abundantly in southern bottomland hardwood swamps. Unfortunately, wetlands also rank high among the habitats most vulnerable to destruction, degradation, and disturbance by human activities. For this reason, the welfare of North American waterbirds has attracted the keen interest of the United States Section of the International Council for Bird Preservation.

Historical changes in United States wetlands

As with most environmental changes, wetland loss has been gradual, not catastrophic, and has been distributed over such a large geographic area that its cumulative magnitude is not readily apparent. Frayer *et al.* (1983) and Tiner (1984) have attempted to summarize data on wetland loss in the United States. Their findings are eye-opening and disturbing. For example, considering all types of wetlands, they estimate that only 99 million acres of the approximately 215 million acres of wetlands that existed in pre-settlement days remain. This represents a cumulative loss of 54%. In California and Iowa, over 90% of the original wetlands have disappeared.

The best information on wetland loss is available for the period between the mid-1950s and the mid-1970s. A gain of approximately 2 million acres during this period (primarily owing to creation

of reservoirs and farm ponds, habitats generally less suitable for waterbirds than natural wetlands) has been more than offset by a loss of 11 million acres (largely wetland drainage for agricultural expansion). The net loss of 9 million acres is equivalent to an area twice that of the state of New Jersey. In more graphic terms, wetlands equivalent to the area of Rhode Island were lost every 2 years over that 20-year period. Figure 1 shows the distribution of these losses among different wetland categories. In terms of total acreage, the categories most affected have been palustrine emergent wetlands (shallow wetlands supporting non-woody vegetation and lacking bedrock features) and palustrine forested wetlands.

Although the loss of coastal and estuarine wetlands appears less dramatic (Fig. 2), in fact, over one-half of these wetland types in the coterminous 48

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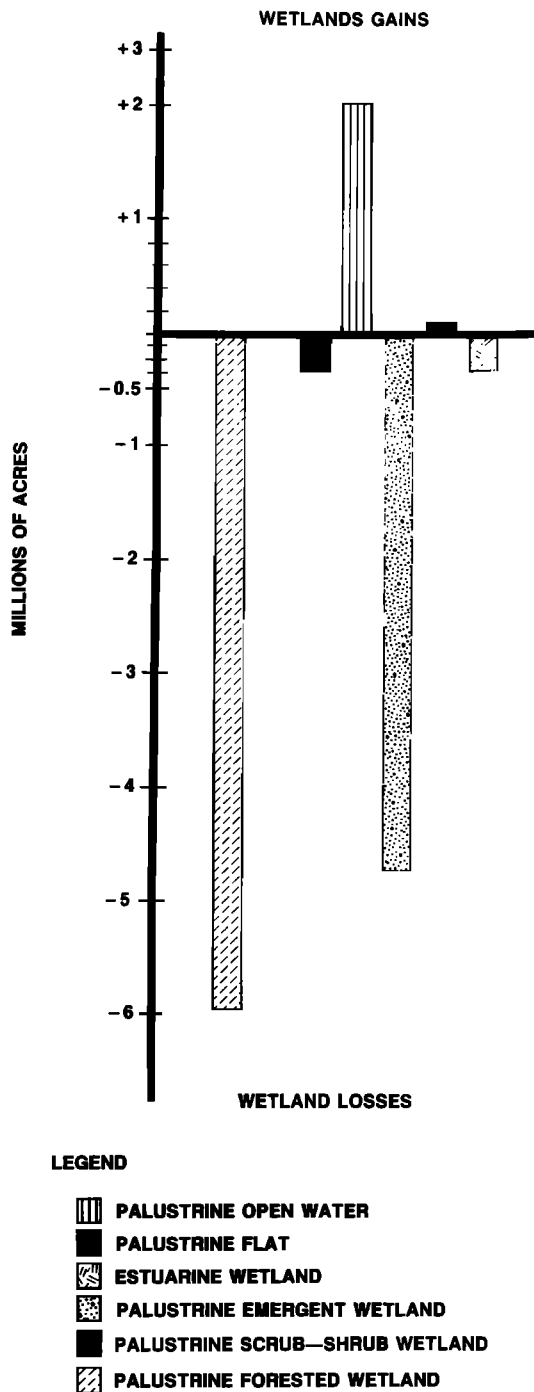


Figure 1. Net losses and gains in wetlands of the coterminous United States between the mid 1950s and the mid 1970s. Palustrine open water and palustrine flats represent man-made ponds and unvegetated wetland flats, respectively. See text for further explanation (from Tiner et al. 1984).

states have been destroyed since early settlement by man. Even more disturbing is the evidence that the rate of loss has been greatest in relatively recent years (Fig. 2). Most of the losses have occurred near high population centers in California, Florida, New Jersey, and Texas. The exception is Louisiana, where over 200,000 acres of tidal

marshes have reverted to open water owing to a variety of man-induced and natural causes. In San Francisco Bay alone, a major wintering area for waterfowl and shorebirds, 160,000 acres of an original 200,000 acres have been filled or diked to create salt evaporation ponds (U.S.F. & W.S. and California Dept. Fish and Game 1979).

Most tidal marshes that have escaped total destruction have been substantially altered, nonetheless, by ditching. This activity, still practiced in many areas, is a method of controlling the salt marsh mosquito, *Aedes sollicitans*. Ditching tends to drain water from portions of high marsh, often promoting encroachment of woody vegetation and undesirable herbaceous vegetation (e.g. *Phragmites*). As a result, few patches of unaltered tidal marsh exist today along the Atlantic coast. The largest remaining is an 11,000-acre tract at Bombay Hook National Wildlife Refuge on Delaware Bay.

A relatively new alternative to traditional mosquito control ditching, known as open marsh water management, is gaining popularity in the Northeast (Ferrigno and Jobbins 1968, Meredith et al. 1985). This approach, based on a concept of creating deep ponds in the upper reaches of a tidal marsh, removes most mosquito-breeding habitat and allows predatory killifish access to the larvae in the remaining breeding sites. Although open marsh water management has the desirable effects of controlling mosquito populations and maintaining water levels throughout the marshes, the impact on use of the marsh by waterbirds has been little studied (Clarke et al. 1984).

Over the past two decades, heightened public awareness has resulted in the enactment of protective legislation on both national and state levels (Sener and Howe 1984). Most coastal states have passed laws that provide at least some protection against indiscriminate marsh alteration. The Coastal Barrier Resources Act of 1982 (Kuehn 1984) removed federal subsidies that heretofore provided incentives for development of barrier islands and associated wetlands. But, however encouraging these recent events may be, enormous and irreversible damage has been done. Impacts of wetland loss and degradation on waterbirds are often difficult to assess directly. Consequently, monitoring and evaluating these wetland systems and birds dependent on them must be a top priority for proponents of waterbird conservation.

Specific issues

Over the past several years, the International Council for Bird Preserva-

tion-United States has been involved in numerous wetland issues that represented, or continue to represent, threats to waterbird populations. Two of the most serious of these issues are currently unresolved and deserve special mention: the threats to Grays Harbor, Washington, and Cheyenne Bottoms, Kansas.

Grays Harbor This tidal estuary in Washington state is unique on the Pacific coast south of Alaska because its 33,600 acres of intertidal habitat annually support over one million shorebirds during their spring northbound migration (Senner and Howe 1984). Only the Copper-Bering River Delta in Alaska is of greater importance in terms of the magnitude of the migrating shorebird populations dependent upon it. At Grays Harbor and in southern British Columbia, shorebirds, especially Western Sandpipers (*Calidris mauri*), Dunlins (*C. alpina*), and both dowitcher

species (*Limnodromus griseus* and *L. scolopaceus*) are believed to accumulate fat reserves that permit a probable non-stop flight to Alaska and prepare them nutritionally for successful breeding (Senner 1979).

The original Grays Harbor Estuary Management Plan called for filling 540 acres of intertidal mudflat and salt marsh known as Bowerman Basin for commercial development. Bowerman Basin happens to be the most important site in the estuary for shorebirds. Surveys in 1981 found that nearly 50% of all the shorebirds in the estuary were consistently concentrated there (Fig. 3). Because no alternate sites that could support even approximately this percentage of shorebirds were available, possible consequences of the filling of Bowerman Basin would have been the disruption of migration and a greatly reduced likelihood of successful breeding.

Representatives of ICBP-U.S. and other shorebird experts were called

upon to provide input to the draft environmental impact statement being prepared by the National Oceanographic and Atmospheric Administration. This input helped call attention to the international importance of Grays Harbor for migrating shorebirds and resulted in substantial modifications of the Grays Harbor Estuary Management Plan. Increasing opposition since then has forced total abandonment of plans to fill Bowerman Basin. Many conservationists are now proposing establishment of a national wildlife refuge in Grays Harbor that would encompass Bowerman Basin. This proposal, however, is inconsistent with the recommendation of the final environmental impact statement that Bowerman Basin be managed by the Port Authority of Grays Harbor. The controversy continues and may not be completely resolved for some time. Meanwhile, at least for the short term, the shorebirds are assured prime migration and wintering habitat in Bowerman Basin.

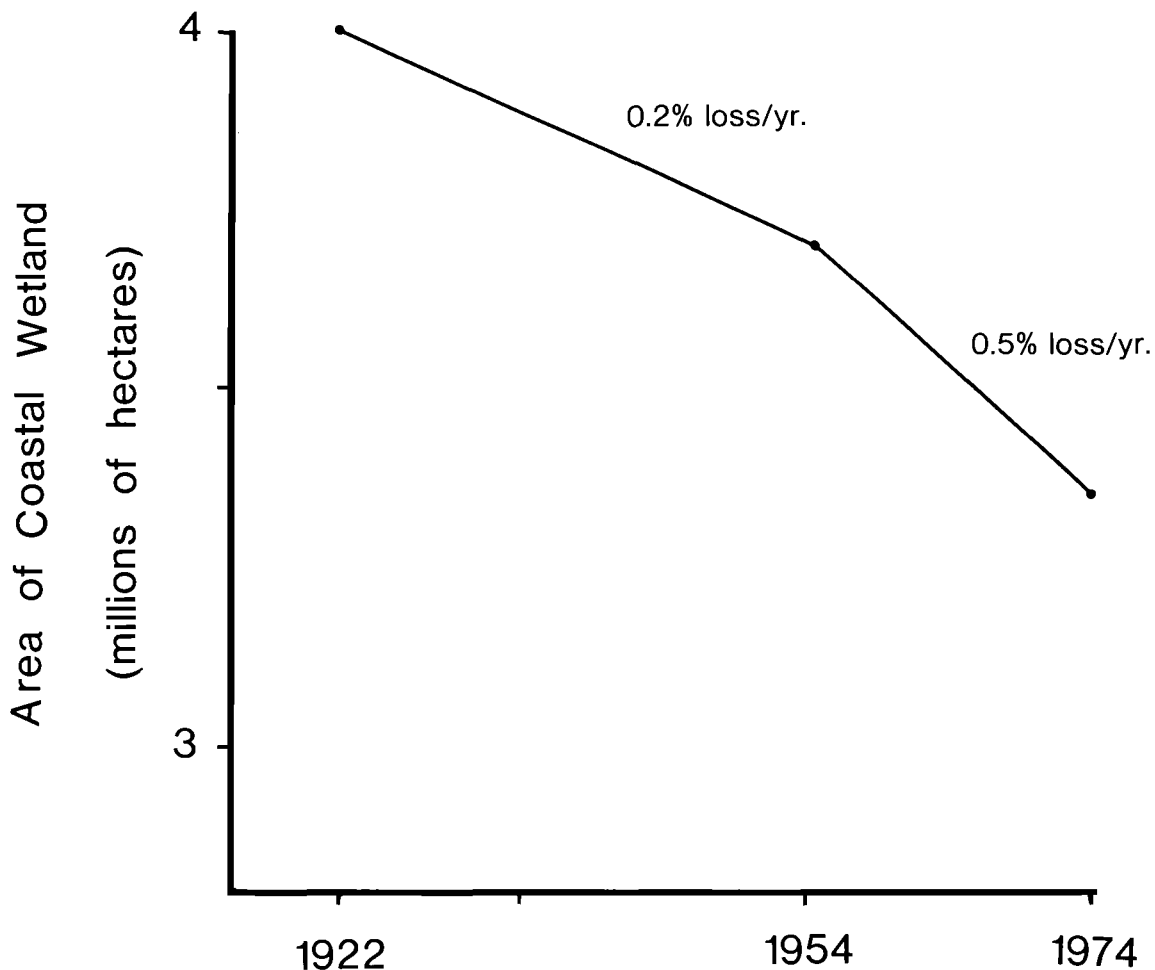


Figure 2. Rate of tidal wetland loss in the coterminous United States, 1922-1974 (from Gosselink and Baumann 1980).

Cheyenne Bottoms Cheyenne Bottoms, in central Kansas, is literally an oasis for migrating shorebirds, waterfowl, rails and other waterbirds. The "Bottoms" is a natural 41,000-acre (64-square mile) basin, fed by streams and rainfall, that normally holds water except during periods of extreme drought. The segment managed by the Kansas Fish and Game Commission comprises 12,000 acres (Schwilling 1985). For shorebirds, Cheyenne Bottoms is by far the most important site in interior North America. It rivals Grays Harbor, Delaware Bay, and the Bay of Fundy for sheer numbers of birds, especially in mid-summer when water conditions are typically most favorable. Cheyenne Bottoms is an important stopover for the endangered Piping Plover (*Charadrius melodus*) and supports breeding populations of Snowy Plovers (*C. alexandrinus*) and the endangered interior race of the Least Tern (*Sterna antillarum*) (Schwilling 1985).

As with much of the Midwest, the problem at Cheyenne Bottoms centers around water diversion for irrigation. For the past 10-12 years, the hydrology of the basin has been deleteriously affected by water-pumping from the Ogallala aquifer to feed proliferating center-pivot irrigation systems. The water levels in the aquifer are directly tied to water levels in the streams that feed the "Bottoms." The net result has been a gradual depletion of waterflow and an increasing frequency of drought conditions during the period of greatest need by shorebirds. Two of the most important impoundments in the management area have been dry for the past 5 years (R. Boyd *pers. comm.*).

Pressure from conservationists, including ICBP-U.S., caused the state of Kansas to provide funds to the Fish and Game Commission to conduct a feasibility study of alternatives to present management practices that would permit effective water retention despite di-

version for agriculture. The study, completed in November 1986, concluded that alternative practices are possible, but at a price tag of \$6 million. Unfortunately, it is unlikely that Kansas will authorize such an expenditure. The future of Cheyenne Bottoms, therefore, remains precarious. The economic and political pressures for water diversion here and elsewhere in the arid Midwest continue to threaten wetlands and thwart efforts of wildlife agencies and conservationists to maintain adequate habitat for waterbirds.

International considerations

Although the International Council for Bird Preservation-United States deals primarily with native bird conservation issues, the concept of "native species" becomes obscured in the case of migratory birds that spend only a portion of their annual cycles in geo-

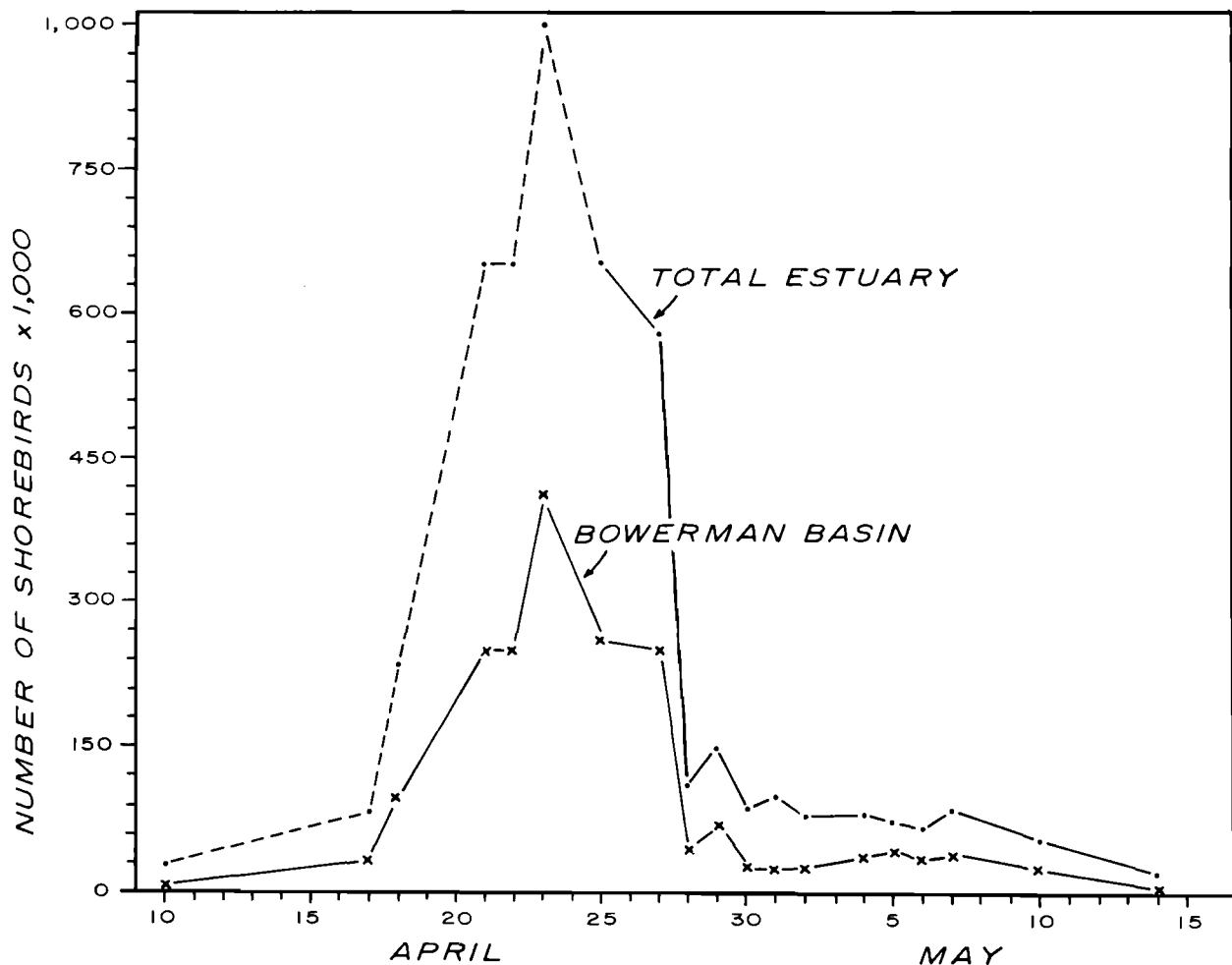


Figure 3. Timing and magnitude of the shorebird migration at Grays Harbor, Washington, spring 1981. Dashed line represents extrapolated values (from Herman and Bulger 1981).

graphic areas under United States jurisdiction. In fact, this is true for the majority of "our" waterbird species. Most species of shorebirds, for example, spend up to 75% of the year in Latin America, where they face problems of wetland loss and degradation similar to those existing in the north temperate zone. A recent survey of Latin American wetlands sponsored by the International Waterfowl Research Bureau (Scott and Carbonell 1986) begins to reveal the disturbing magnitude of these changes. An example of immediate concern is a proposal to develop, as an industrial complex and resort, the Paracas National Reserve in Peru. The Reserve encompasses a coastal wetland system of great importance to many wintering waterbirds in an arid zone largely devoid of shallow wetlands. We can only guess at the effect these changes are having on waterbirds that breed in North America. However, it is vital that we do not lose sight of the possible impact of wintering ground losses on North American breeders and the need for international cooperation in preserving a system of wetlands throughout the southwestern hemisphere.

A recent effort to promote international cooperation on behalf of shorebirds has been endorsed by the International Council for Bird Preservation-United States. The Western Hemisphere Shorebird Reserve Network, an informal consortium of conservation organizations and state and federal agencies, looks toward conserving shorebirds by protecting critical wetlands throughout their annual ranges (Myers *et al.* 1987). The concept is basically similar to the practice in the United States and Canada of protecting both breeding and wintering waterfowl through an extensive system of refuges and management areas. It differs in that the geographic scale encompasses all of North and South America and recognizes that migration stopovers are critical bottlenecks in the annual cycle (Myers 1983). The Western Hemisphere Shorebird Reserve Network, still in its infancy and lacking formal structure, has been remarkably successful in enlisting favorable support from the United States and Canadian governments and some Latin American countries. Wetlands formally recognized by two or more countries, states, or provinces as being key sites along the migration route of one or several species

are known as "sister reserves." The joint recognition and designation of such sites by governments heightens public awareness of shorebird conservation needs and we hope will lead to direct protection and management measures. The first site to be so designated, the lower estuary of Delaware Bay, was officially dedicated by the governors of New Jersey and Delaware in November 1985, because of its great importance to migrating shorebirds in spring. The state of New Jersey has purchased one of the most important segments of the Delaware Bay shoreline and designated it strictly as a shorebird preserve. This laudable conservation initiative is unprecedented in this hemisphere.

The value of formal multi-national agreements on wildlife conservation issues cannot be overestimated. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has encouraged signatory nations to prepare lists of their endangered species so that commercial trade in species so designated can be more strictly regulated. Likewise, the Ramsar Convention of 1971 has great potential, already partly realized, for effecting a quantum leap in the international conservation of wetlands and waterbirds. This convention was held largely through the efforts of the International Waterfowl Research Bureau. It obliges contracting parties to include wetland considerations in their land use planning, to establish wetland nature reserves, and to designate at least one wetland for inclusion in a "List of Wetlands of International Importance." These sites are typically listed on the basis of their importance to waterfowl or other waterbirds, and it is incumbent upon each nation to demonstrate active conservation measures. Ichkeul National Park in Tunisia, and the Wadden Sea in the Netherlands, are two extremely important sites for which the respective governments have pledged conservation action.

The terms of the Ramsar Convention became operational in 1975 following the accession of the seventh nation, Greece. By mid-1985, 40 nations were formal contracting parties. Throughout the Carter and early Reagan administrations, the International Council for Bird Preservation-United States pressed vigorously for United States ratification of Ramsar, but, in the face of substantial political opposition, the efforts were

unsuccessful. Finally, in October 1986, the Senate consented to ratification and President Reagan signed the articles of ratification in November 1986.

On April 18, 1987, the United States officially became a contracting party to the Ramsar Convention, joining the other Western Hemisphere signatories: Canada, Mexico, Surinam, Uruguay, and Chile. Four National Wildlife Refuges have been identified by the United States as Wetlands of International Importance: Ash Meadows, Nevada; Edwin B. Forsythe, New Jersey; Izembek, Alaska; and Okefenokee, Georgia. This is a major step in solidifying a Ramsar network in this hemisphere and should provide impetus for other Latin American countries to follow suit.

Although Ramsar, the Coastal Barrier Resources Act, and other achievements represent considerable progress in wetlands conservation, the trends in wetland abundance and quality continue to be negative. The gradual attrition of healthy wetlands over broad geographic areas may eventually prove to be of greater consequence than site-specific problems. This underscores the need for both local and more global perspectives for addressing waterbird conservation problems. The International Council for Bird Preservation-United States will continue to track important wetland conservation issues and attempt to influence decisions on those that seriously threaten the welfare of waterbirds. In the long run, the direct and indirect affects of legislation and international agreements, along with judicious action on the part of government agencies and environmental organizations, will, we hope, secure the quantity and diversity of wetlands required to sustain healthy waterbird populations throughout the hemisphere.

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Study Complete

Kansas Activists Weigh Alternatives for Saving Bottoms

Cheyenne Bottoms, a 64-square-mile basin in the center of Kansas, is a wetland of major importance to resident and migratory birdlife. The mudflats host tens of thousands of shorebirds, including long-billed dowitchers, Baird's sandpipers, and American avocets; 328 species of birds have been recorded in the bottoms, and 62 species winter there. Some biologists believe that the site is the most important staging wetland for spring migrating shorebirds in the United States. Last year, the bottoms became a whooper hotspot as well; several of the rare cranes visited long enough to attract birders from across the state.

While water never was a sure thing in this prairie wetland, the area has become progressively drier in recent years. Farmers uphill from the bottoms have learned to save moisture through

such miserly practices as terracing and conservation tillage, gradually cutting off the bottoms' water supply.

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In 1985, after years of innovative campaigning, Kansas Auduboners and other conservationists convinced the state to do a comprehensive analysis of the problem and recommend ways to keep the bottoms damp. The study was finished in January of this year and, according to Jan Garton, coordinator of Saving Cheyenne Bottoms, it is the basis for discussions now under way on how to deal with the disappearing wetland. Saving Cheyenne Bottoms is a coalition of conservation groups.

The study proposed a variety of engineering solutions with different price tags. "We'll push for whatever's best for the birds," Garton said, "and worry about the money later."

It will take some time for all interested parties to agree on a course of action. The coalition knows that any new plumbing in the basin will be expensive, and has begun a fundraising drive to help cover the cost. The repairs probably will include water storage reservoirs and high-capacity pumps.

Garton thinks that people will be willing to pitch in to save the state-owned basin since it is much used as a study and recreation area. Last year, 15,567 birders and nearly 4,000 waterfowl hunters visited the bottoms.

For more information, write: Saving Cheyenne Bottoms, 219 Westwood Rd., Manhattan, Kan. 66502; and the Audubon West Central regional office.

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