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Classification and Occurrence of the Birds of the Playa Lakes of Meade County, Kansas

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Very little data can be found about birds, other than waterfowl, which frequent playa lakes, and no information is known from Kansas other than scattered records. In addition, "Little information exists on population trends of shorebirds throughout interior flyways where wetland losses are most dramatic" (Helmets, 1993).

This paper is an attempt to list and group birds into 10 separate categories, based upon their use of the playa lakes of Meade County, Kansas. Categories and the occurrence of a species are based upon 13 years of unpublished field notes from Meade County, and an exhaustive literature search. A larger report (Flowers, 1995) listing individual records will soon be published.

Helmets (1992) attempted to separate shorebirds into "foraging guilds and habitat types", but did not include other bird types, nor did he include all shorebirds occurring in Meade County, Kansas.

There is an immediate need for organized listings of birds and other wildlife which use playa lakes, and for a classification scheme to logically group the animals which use playa lakes. A grouping scheme is needed to make possible the study of playa lakes, the birds which frequently use them, and to recognize the role playa lakes play in the life cycle of several bird species. Not all playa lakes are of equal value for wildlife, and a categorization scheme is needed to determine each playas' ultimate value for various bird species and types. Helmets (1993) says that "With the continuous decline of habitat and water birds, public and private wetland managers today are faced with challenges of managing habitats for multiple species groups, when little information may be available on life-history strategies and habitat requirements." These groupings are a modification from widely used and accepted plant classification schemes already in place (Federal Interagency Committee for Wetland Delineation. 1989).

Playa lakes, or "wheat field ponds" are mentioned by nearly everyone who has studied birds in Meade County, including Goss (1886 and 1891), Hibbard and Rinker (1943), Graber and Graber (1951), Zuvanich and McHenry (1964) and Flowers (1995). Many of these shallow lakes have been altered or permanently converted by drainage or filling, and their true value is only now beginning to be fully understood. Meade County has several thousand playa lakes, more than any other county in Kansas. These lakes range from less than one half acre to over 100 acres in size, and from a few inches to a maximum of 3 to 4 feet in depth. One hundred sixty eight species of birds are associated with these playa lakes.

Playa lakes are located in the "upland plains in the northwestern and east-central parts of the county" where the landscape is "flat and featureless" (Tomasu, 1977). Playa lakes are undrained depressions which become seasonal wet areas. They are wind-deflated depressions that were etched on the surface during the Pleistocene period (Bolen et al., 1989). The Pleistocene period occurred from about 2 million years ago to our present or Recent period (Terres, 1989).

Playa lakes or basins are lined with Ness clay soil, and are nearly impermeable,

collecting and holding runoff from even minor rainfall events. As a rule, these areas are not successfully farmed due to the soil texture and frequent flooding, but cultivation is common.

In the Southern High Plains of Texas, there is no evidence of naturally occurring fish populations in playas, although some sites have been stocked with such species as channel catfish (*Ictalurus punctatus*) (Bolen et al., 1989). Meade County playas also have no fish, except where stocked, but may contain tiger salamanders (*Ambystoma tigrinum*), tadpoles and crayfish.

Playa lakes are extremely rich with small invertebrate animals required by shorebirds and puddle ducks. Bolen et al. (1989) quote one study showing invertebrates averaged 20 percent of the volume of food in Northern Pintails collected after feeding in playas. "Macroinvertebrates are a key resource for shorebirds...In interior areas, diptera (fly larvae) are an important invertebrate prey consumed by shorebirds during migration and breeding" (Helmers, 1992). Playa lakes are second in importance only to the Gulf Coast as winter habitat for waterfowl in the Central Flyway (Bolen et al., 1989), and second to none as migration habitat.

Many of the invertebrates which live in playa lakes are found only in these shallow pools and have adapted quite well to the wet and dry cycle of western Kansas playa lakes. Fairy shrimp, tadpole shrimp and clam shrimp (Eubranchiopoda) have been collected and appear to make up the majority of the large, conspicuous invertebrates in Meade County playas. They have not yet been identified to species. These invertebrates eggs have been found to remain viable for up to fifteen years in dry soil. In fact, they do not occur in perennial waters, and many scientists believe they must go through a dry cycle to hatch (Pennak, 1953). There are most likely many more small invertebrates to be found in playas, including midge larvae and zooplankton.

Many playa lake invertebrates can complete their entire life cycle in as little as 15 days. In just 18 to 21 days, an entire new generation can appear, making them well adapted to the often short periods of inundation.

Many of the playa lakes in Meade County have been drained or filled due to irrigation development in the 1970's and only a few large ones remain. Programs through the United States Department of Agriculture (U.S.D.A) and the Army Corps of Engineers now protect many of the remaining playas and other wetlands.

A 1954 United States Fish and Wildlife Service inventory showed 13,219 acres of playa lake wetlands in Meade County (Monda, 1993). A recent U.S.D.A. Natural Resources Conservation Service study (unpublished) using ten years of aerial photography, soils information and the draft copy of the United States Fish and Wildlife Service's Wetland Inventory maps, showed only 238 wetlands covering 2,604.6 acres and an additional 484 "potential wetlands" remain. This is a reduction of over 80 percent from the 1954 study. Some of this change is accounted for by changes in definitions, but there is no question that many playa lake wetland areas in Meade County have been forever altered.

"The analysis of water from four playa lakes in Meade County, Kansas demonstrates that pesticides can be found in playas that have agricultural land in their watersheds. The herbicides atrazine, terbuthyl, and metolchlor were found in significant amounts in these playas. The effects of these substances on the vegetation is unclear...but would select for grasses or broad-leafed forbs" (Kindscher, 1994) and indirectly select for bird species through habitat modification.

During prolonged periods of inundation, some blue-green algae appear in playa lakes, but never in quantities that would indicate eutrophication. Eutrophication often results when water bodies are overloaded with various fertilizers. Most fertilizers in the playa lakes area of Meade County, are applied for small grain crops after the period of intense spring rains which often fill the playa lakes with water. Heavy rains at other times of the year could however, load playa lakes with excessive fertilizers resulting in temporary eutrophication. The effects of eutrophication on invertebrates and other wildlife of the playa lake is unknown.

Playa lakes have recently been identified as critical habitat for a large number of bird species and efforts are underway through both governmental and private agencies to protect and enhance them.

DEFINITIONS

For the purposes of this work, the following terms will be used as shown in figure 1 and figure 2:

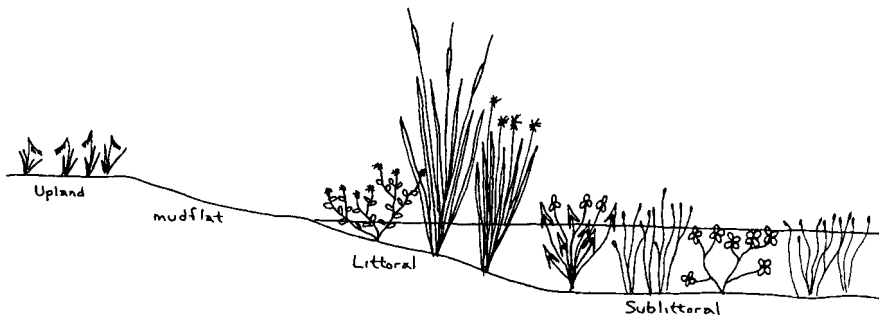


Figure 1—Playa lakes of Meade County, Kansas can be divided into four zones by the plants which grow there.

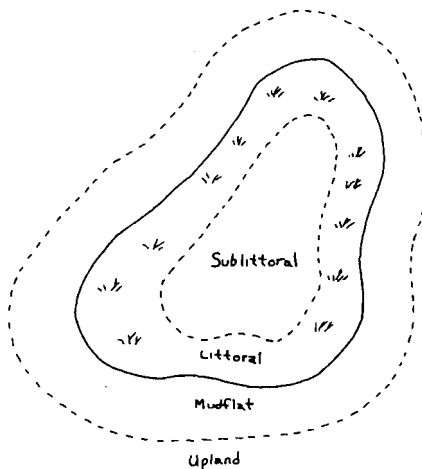


Figure 2—Playa lakes of Meade County, Kansas have four distinct, concentric zones separated by the vegetation which grows in each zone.

Littoral - The littoral zone of a playa lake is that area of the lake comprised of dense, emergent vegetation such as narrow-leaved cattail (*Typha angustifolia*), bulrush (*Scirpus acutus*) and salt-marsh aster (*Aster subulatus*). This zone is usually found in playa lakes which are either uncultivated or infrequently cultivated, and are either ungrazed, or infrequently grazed. At times, the entire water area of a playa may be included in the littoral zone.

Sublittoral - The sublittoral zone of a playa lake is that area of the lake comprised of sparse, emergent or floating vegetation such as spike rush (*Eleocharis macrostachya*), smartweed (*Polygonum bicornis*), water milfoil (*Myriophyllum exalbescens*) and arrowhead (*Sagittaria graminea*). This zone is usually found in the center of uncultivated playas and may be caused by wave action, depth of water, or by a

longer period of inundation. It is also found on playas which are heavily grazed. This zone can occupy the entire water area of a playa, especially if it is regularly cropped or grazed.

Mud Flat - The mud flat zone of a playa, is the open, mostly unvegetated mud flat surrounding the water area. This area is caused by receding water levels, and is more prominent in playas which are periodically cultivated. It can be as small as a few feet, or occupy the entire playa as it dries up.

Upland - The upland zone is the area surrounding the playa, and is usually composed of small-grain cropland or native rangeland composed mostly of blue grama (*Bouteloua gracilis*), buffalo grass (*Buchloe dactyloides*) and western wheatgrass (*Agropyron smithii*).

Obligate - Obligate birds nearly always occur in a given playa lake zone. They are dependent upon playa lakes or other water bodies in the area.

Facultative - Facultative birds usually occur in a given playa lake zone, but occasionally occur in other habitats.

Opportunistic - Opportunistic birds regularly occur in a given playa lake zone, but are also regularly found in other habitats outside of playa lakes.

*Birds known to nest in the county are marked with an *, while those suspected of nesting are marked with a (*).*

Categories of Playa Lake Birds

Group I, Obligate Littoral

Birds which nearly always occur in the water areas of playa lakes with dense, emergent vegetation.

American Bittern(*)	Virginia Rail(*)
Least Bittern(*)	Sora(*)
Great Egret(*)	Common Snipe
Snowy Egret	American Woodcock
Little Blue Heron(*)	Sedge Wren(*)
Cattle Egret(*)	Marsh Wren(*)
Green-backed Heron(*)	Common Yellowthroat*
Black Rail(*)	Yellow-breasted Chat*
King Rail(*)	

Group II, Obligate Sublittoral

Birds which nearly always occur in the water of playa lakes with sparse, emergent or floating vegetation.

Pied-billed Grebe*	Northern Shoveler(*)
Eared Grebe(*)	Gadwall*
Great Blue Heron*	American Wigeon
Black-crowned Night-heron*	Canvasback
Yellow-crowned Night-heron	Redhead
White-faced Ibis(*)	Ring-necked Duck
Greater White-fronted Goose	Lesser Scaup
Snow Goose	Common Goldeneye
Canada Goose	Bufflehead
Wood Duck*	Ruddy Duck(*)
Green-winged Teal*	American Coot*
Mallard*	Sandhill Crane
Northern Pintail(*)	Whooping Crane
Blue-winged Teal*	Wilson's Phalarope(*)
Cinnamon Teal(*)	

Group III, Obligate Mud Flat

Birds which nearly always occur on the open, unvegetated or sparsely vegetated mud flats of playa lakes, or the shallow water adjacent to the shore.

Black-bellied Plover	Sanderling
Lesser Golden Plover	Semipalmated Sandpiper
Snowy Plover(*)	Western Sandpiper
Semipalmated Plover	Least Sandpiper
Black-necked Stilt(*)	White-rumped Sandpiper
American Avocet*	Baird's Sandpiper
Greater Yellowlegs	Pectoral Sandpiper
Lesser Yellowlegs	Stilt Sandpiper
Solitary Sandpiper	Short-billed Dowitcher
Willet	Long-billed Dowitcher

Group IV, Facultative Littoral

Birds which usually occur in the water areas of playa lakes with dense, emergent vegetation, but occasionally occur in other habitats.

Red-winged Blackbird*	Eastern Meadowlark(*)
Yellow-headed Blackbird*	

Group V, Facultative Sublittoral

Birds which usually occur in the water areas of playa lakes with sparse, emergent or floating vegetation, but occasionally occur in other habitats.

Osprey	Herring Gull
Franklin's Gull	Forester's Tern
Ring-billed Gull	Black Tern

Group VI, Facultative Mud Flat

Birds which usually occur on the open, unvegetated or sparsely vegetated mud flats or the shallow water adjacent to the shore of playa lakes, but occasionally occur in other habitats.

Spotted Sandpiper*

Group VII, Opportunistic Littoral

Birds which are regularly found in the dense emergent vegetation of playa lakes due to the presence of needed habitat or food. Use is often seasonal, or when dry.

Ring-necked Pheasant*	Indigo Bunting*
Northern Bobwhite*	Painted Bunting(*)
Carolina Wren	Rufous-sided Towhee
Bewick's Wren	American Tree Sparrow
House Wren*	Vesper Sparrow
Winter Wren	Fox Sparrow
Golden-crowned Kinglet	Song Sparrow
Ruby-crowned Kinglet	Lincoln's Sparrow
Bell's Vireo*	Swamp Sparrow
Warbling Vireo*	White-throated Sparrow
Yellow Warbler(*)	White-crowned Sparrow
Magnolia Warbler	Harris' Sparrow
Yellow-rumped Warbler	Dark-eyed Junco

Group VIII, Opportunistic Sublittoral

Birds which can be regularly found in the shallow water areas of playa lakes with sparse, emergent or floating vegetation, but are also regularly found in other habitats.

Peregrine Falcon

Group IX, Opportunistic Mud Flat

Birds which can be regularly found on the open unvegetated or sparsely vegetated mud flats of playa lakes, but are also regularly found in other habitats.

Killdeer*	American Pipit
Long-billed Curlew(*)	McCown's Longspur
Least Tern*	Lapland Longspur
Horned Lark*	Chestnut-collard Longspur

Group X, Opportunistic Upland

Birds which occur throughout the area, and also regularly appear at playa lakes for temporary shelter or food.

Bald Eagle	Western Kingbird*
Northern Harrier(*)	Eastern Kingbird*
Sharp-shinned Hawk(*)	Scissor-tailed Flycatcher*
Swainson's Hawk*	Tree Swallow
Red-tailed Hawk*	Northern Rough-winged Swallow
Ferruginous Hawk*	Bank Swallow
Rough-legged Hawk	Cliff Swallow*
Golden Eagle*	Barn Swallow*
American Kestrel*	Blue Jay*
Merlin	American Crow*
Mourning Dove*	Black-capped Chickadee*
Black-billed Cuckoo(*)	Carolina Chickadee*
Yellow-billed Cuckoo*	Northern Mockingbird*
Common Barn-owl*	Brown Thrasher*
Eastern Screech-owl(*)	Loggerhead Shrike(*)
Great Horned Owl*	European Starling*
Short-eared Owl	Dickcissel*
Common Nighthawk*	Lark Sparrow*
Common Poorwill(*)	Western Meadowlark*
Red-headed Woodpecker*	Common Grackle*
Downy Woodpecker*	Brown-headed Cowbird*
Hairy Woodpecker*	Orchard Oriole*
Northern Flicker*	Northern Oriole*
Olive-sided Flycatcher	House Finch*
Western Wood-pewee	Pine Siskin*
Eastern Wood-pewee	American Goldfinch(*)
Willow Flycatcher	House Sparrow*
Least Flycatcher	

The above listings are not meant to be all-inclusive, and many of the classifications are open to debate. Some species could change their classification by season, such as the Red-winged Blackbird. Others change merely by the presence or absence of water. The Spotted Sandpiper feeds on mud flats, while nesting in uplands. Each species is listed only once, in its' category of principle use, even though many of the listed species could occur in several habitats.

The above ten groupings are meant only as a starting point in the classification of birds utilizing playa lakes. It is hoped that others will contribute records of playa

lake sightings through the literature. Comments are welcome.

I would like to thank Ken Kuiper, Ken Sherraden and Steve Myers of the U.S.D.A. Natural Resources Conservation Service, as well as Kelly Kindscher and Bill Busby of the Kansas Biological Survey for their critical review and constructive comments on this paper.

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Early Painted Bunting Specimen Record for Saline County, Kansas. The map showing the status of the Painted Bunting (*Passerina ciris*) in Kansas (Thompson, Max C. and C. Ely. 1989. Birds in Kansas, Vol. 2, Univ. Kansas Mus. Nat. Hist. Public Educ. Series, No. 11) indicates sight records, but no specimen record, for Saline County; nor does the text indicate breeding there (ibid.).

In 1918 Albert J. Kirn, a native Kansas born in 1885, and a talented amateur naturalist and oologist, reported finding a nest with three eggs of the Painted Bunting near Solomon, Saline County, Kansas, on 10 June 1918. He stated that he returned three days later and collected the eggs and the female bunting (Kirn, A. J. 1918. Supposed new record for Central Kansas. Condor 20:191 and Messerly, E. H. 1972. Forgotten records of Painted Bunting in Kansas. Kansas Orni. Soc. Bull. 23[4]:20).

Kirn worked in the oil fields in California for a time and later in northeast Oklahoma, eastern Kansas and in several localities in Texas, finally settling in Somerset near San Antonio where he remained until his death in 1950. From his youth until 1938, wherever he lived, he collected bird eggs. He collected bird skins and other natural history specimens up to the year of his death, exchanging with other amateur naturalists and sending specimens to professional naturalists for identification.

At Kirn's death, his sizable natural history collection complete with field note books and other data was presented to St. Mary's University, San Antonio, Texas. In the 1960's, after the field note books and journals, most bird egg data slips and other data not attached to the specimens themselves disappeared, the collection was donated to the Natural Science for Youth Foundation. This organization, in turn distributed it among their affiliate museums. The existence of many of Kirn's specimens in his scattered collection is known, but their present day location is not.

A collection of Kirn specimens was found at the University of North Texas, Denton (no one seems to know where it came from). By 1989 the collection was sent to the Texas Cooperative Wildlife Collection at Texas A & M University, College Station. They in turn sent the specimens on long term loan to Heard Natural Science Museum and Wildlife Sanctuary, McKinney, Texas.

In this collection is a headless specimen of a female Painted Bunting (TCWC 12390). The label indicates that it was collected by A. J. Kirn on 10 June 1918 near Solomon, Saline County, Kansas. In spite of the discrepancy in the collecting date, which would have been 13 June, according to his note (op.cit.), this is undoubtedly the specimen he collected. The set of eggs has never been found.

I wish to thank Ken Steigman and Harold Laughlin of Heard Natural Science Museum and Wildlife Sanctuary for giving me information about this specimen and allowing me to see it.

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