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Louis B. Best
Iowa State University

Kathryn E. Freemark
National Wildlife Research Centre

Barbara S. Steiner
Iowa State University

Timothy M. Bergin
Iowa State University

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Life History and Status Classifications of Birds Breeding in Iowa[1]

LOUIS B. BEST[2], KATHRYN E. FREEMARK[3], BARBARA S. STEINER[2], AND TIMOTHY M. BERGIN[2]

[2]Department of Animal Ecology, Iowa State University, Ames 50011
[3]National Wildlife Research Centre, Environment Canada, Ottawa K1A 0H3

Life history and status classifications were compiled for 145 bird species that breed in Iowa. Species were classified by food type and substrate, nest substrate, susceptibility to cowbird parasitism, migratory status, predominant habitat use and habitat-use specialization, body mass (an index of home range/territory size), area sensitivity, population trend and vulnerability, and beneficial/harmful aspects in relation to agriculture. Such information may be used to make interspecific comparisons, evaluate interrelationships among life history and status characteristics, and provide insights into the interpretation of previous research. This synthesis also can aid those responsible for making conservation and management decisions about Iowa's avifauna.
INDEX DESCRIPTORS: life history classifications, status classifications, guilds, breeding birds, Iowa

Much that is known about birds in Iowa comes from field studies that have documented distribution, abundance, habitat use, and (or) nesting ecology. Best et al. (1995) reviewed and summarized the existing data on abundance and nesting status for 144 bird species (the two meadowlark species were combined) that normally breed in Iowa; extremely rare breeders (Dinsmore et al. 1984) were excluded. This information was synthesized into a standardized format for 20 habitats typically found in the agricultural landscapes of Iowa. Such information can improve understanding of habitat use by birds and provide insight into the impacts of agriculture and other land-use practices on Iowa's avifauna.

Although a knowledge of the bird species that use various habitats and their relative abundances can be insightful in evaluating land-use and conservation practices, much more information is available that could enhance interpretation of bird abundance patterns. For example, bird species can be classified on the basis of life history traits (Hansen and Urban 1992), population status (Freemark and Merriam 1986), or in relation to their interactions with people. Such information, however, is scattered throughout a diverse literature, some of which is not easily accessed. There have been efforts to organize this type of information, particularly life history characteristics, into databases, but such a synthesis has not been undertaken specifically for the breeding birds of Iowa.

The objective of this paper was to compile data on the life history and status classifications for 145 bird species (139 native and 6 introduced; Table 1) that normally breed in Iowa into a consolidated reference source and to make such information available to others who are involved in interpreting abundance patterns, making land-use decisions, developing management strategies, or simply want to know more about Iowa's birdlife. In this synthesis, species were classified according to: food type, foraging substrate, nest substrate, migratory status, predominant habitat use and habitat-use specialization, body mass (an index of home range/territory size), area sensitivity, population trend and vulnerability, and beneficial/harmful aspects in relation to agriculture. Each of these will be addressed in sequence in this paper.

METHODS

The data to classify species were obtained from a variety of sources, and in some instances decisions were made as to how the data would be synthesized, interpreted, and (or) presented. The sources of information and the rationale for decisions are discussed below.

Information about the food type and foraging substrate of each species was obtained primarily from De Graaf et al. (1985). The food type and foraging substrate designations were based on the major food in the diet during the breeding season. If such information was not presented, the year-round characterization was used. Some of our foraging substrate types represent consolidations of the categories presented in De Graaf et al. (1985). Food types include insectivore (insects), crustaceovore (crustaceans), vermivore (earthworms), carnivore (vertebrates), piscivore (fish), granivore (seeds or nuts), herbivore (plant leaves, stems, or roots), and omnivore (a variety of plant and animal foods). Foraging substrates include ground or low herbaceous vegetation, shrubs or lower canopy of trees, upper canopy of trees, bark of trees, flowers, water (ponds, lakes, rivers, or streams), marsh (on mud, in shallow water, or on marsh plants), shore, and air.

Nest substrate information was obtained primarily from Harrison (1978) and Ehrlich et al. (1988). The nest substrate categories represent the most common nest placement by each species and include ground or herbaceous vegetation, shrubs or saplings, tree branches, tree cavities (primarily dead trees), stream banks, herbaceous vegetation over water, and buildings or other man-made structures.

We reviewed information in Freidmann (1963, 1971), Freidmann et al. (1977), and Freidmann and Kiff (1985) to determine which bird species are potential hosts of the brown-headed cowbird (see Table 1 for scientific names) and to ascertain the incidence of parasitism in each species. The Friedmann references provide qualitative descriptors of the frequency of parasitism for each host species and also include some incidence data (nests parasitized/nest found). Both were used to characterize bird species' susceptibilities to the brood parasite. The categories selected (and examples of the qualitative descriptors included within each category) were: none, rare (rarely, unlikely), uncommon (uncommon, infrequent, seldom, occasional), frequent (frequent, fairly frequent, fairly common), and regular (regular, frequent [see below], very frequent, one of the most common). If the parasitism of a particular host was described as "accidental" and was supported by only one recorded account, it was included in the "none" category. When there were differences, the qualitative descriptors in more recent references were given greater weight in making decisions than those in earlier articles because the former were based on the most inclusive empirical data. Also, greater reliance was placed on the incidence data in making decisions in instances where the qualitative descriptors seemed to fall midway between two categories or were contradictory. For example, sometimes species which had been described as "frequent" cowbird hosts in the Friedmann references were placed in the "regular" category because of high incidence values. If incidence data were presented for more than one geographical region of the U. S., the data from the Midwest were given precedence. Our evaluations of susceptibility to

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cowbird parasitism are likely conservative for those species that eject cowbird eggs from their nests and (or) are poorly studied. In both instances there has been less opportunity for researchers to document brood parasitism.

The migratory status of bird species was obtained primarily from Partners in Flight (1992), and we used the Partners in Flight definitions for Neotropical and short-distance migrants. For those species not included in the Partners in Flight listing, we relied on geographical range information from Robbins et al. (1983) and Johnsgard (1979). Neotropical migrants are defined as those species that breed in Iowa and spend their nonbreeding period primarily south of the U. S. Short-distance migrants are species that breed in Iowa and winter extensively in North America, although some populations winter south of the U. S. Resident species remain in Iowa year round.

Predominant habitat use during the breeding season was based on a general knowledge of species' habitat affinities and information summarized by Best et al. (1995). Six general habitat categories were identified: grassland/cropland, wetland, wooded edge (forest edge, shrubland, or old field), forest (deciduous or coniferous), riparian (near watercourses, usually wooded), and urban/farmstead.

Habitat-use specialization was classified on the basis of the number of habitat types in which each species is known to nest. Availability of suitable nesting habitat can limit the occurrence of birds during the breeding season (e.g., O'Connor and Shrubb 1986, Best et al. 1995); consequently, the breadth of habitats used for nesting can serve as an index of habitat-use specialization. The four major habitat types used to develop this classification were grassland, wetland, wooded edge, and forest. Information about the nesting habitats of bird species in Iowa was obtained from Best et al. (1995). We recognize that an index of habitat-use specialization could be based on other life-history requisites, such as food, and that the selection of the habitat categories used in calculating such an index is subjective. Nonetheless, one must start somewhere, and we were particularly interested in the effects on birds of habitat alterations cause by agriculture.

Body mass values were included as an indirect measure of birds' home range/territory sizes. There is a positive relationship between body size and home range/territory size in birds (Schoener 1968, Holling 1992), and direct documentation of home range/territory sizes in midwestern landscapes has either not been done or is reported inconsistently for most species. Mean body mass for each bird species was obtained from Dunning (1993). For sexually dimorphic species, the mean values for females and males were averaged to produce a single body mass value for the species.

Many bird species seem to be adversely impacted by a reduction in habitat patch size (Freemark et al. 1995). Area sensitivities of the bird species in Iowa were classified on the basis of a review of the published literature (see references cited in Table 1). The following categories were used in classifying area sensitivity: (1) species consistently reported to have a positive area sensitivity (i.e., bird abundance, frequency of occurrence, or nest success was greater with increasing habitat patch size), (2) species primarily reported to have a positive area sensitivity but in some studies no area sensitivity was detected, (3) species that have primarily no area sensitivity but in some studies a positive area sensitivity was detected, (4) species consistently reported to have a negative area sensitivity (i.e., bird abundance, frequency of occurrence, or nest success decreased with increasing habitat patch size), (5) species primarily reported to have a negative area sensitivity but in some studies no area sensitivity was detected, (6) species that have primarily no area sensitivity but in some studies a negative area sensitivity was detected, (7) species consistently reported to have no area sensitivity, (8) species whose area sensitivity is unknown because of contradictory results reported in the literature, and (9) species whose area sensitivity is unknown because it has not been studied.

The status of Iowa breeding bird populations was characterized in two ways: Breeding Bird Survey trends and Partners in Flight prioritizations. Breeding Bird Survey (BBS) trend data were obtained for Region 3 of the Fish and Wildlife Service for the period 1980-1994. This region encompasses Iowa, Minnesota, Missouri, Wisconsin, Illinois, Indiana, and Ohio. We chose to use regional BBS data rather than data obtained solely from Iowa because the larger sample size of the former provided more reliable trend estimates. This was particularly true for species in low abundance in Iowa. Although BBS data are available for the region back to 1966, we selected the analysis for 1980-1994 because it more accurately reflects current population trends. The BBS data were categorized as (1) a significant positive trend, (2) a significant negative trend, (3) no significant trend, and (4) an inadequate sample for trend analysis. The procedure used to estimate the trends is detailed in Link and Sauer (1994).

The Partners in Flight prioritization scheme focuses on landbirds that breed in North American temperate zones and migrate south of the continental U. S. during nonbreeding seasons (i.e., Neotropical migrants) (Hunter et al. 1993). Short-distance migrants and nonmigratory species are not included in this prioritization. The ranking criteria used to set priorities measure characteristics of species that make them vulnerable to local and global extinction, namely global abundance, global extent of breeding and winter distributions, threats during breeding and nonbreeding periods, population trend (for the Midwest region in our study), and the importance of the area (Midwest) under consideration for conservation of the species. These criteria are described in detail in Hunter et al. (1993). A species is assigned a rank score for each criterion ranging from 1 (low concern) to 5 (extremely high concern). The scores presented in Table 1 were developed for the Midwest region by Thompson et al. (1993) and are means of the seven criteria scores for each species.

The status of bird species in relation to midwestern agriculture also was determined. Birds were considered to benefit agriculture either by consuming seeds of pest weeds or insects harmful to agricultural crops. In evaluating birds for their potential benefits to agriculture, we only considered those species that use agricultural cropland (row crops, small grains, hayfields) or habitats adjacent to cropland during the breeding season (Best et al. 1995). Because of their habitat-use patterns, such species should have at least the potential to consume weed seeds and (or) crop-damaging insects. Lists of the species of weeds and insects harmful to agriculture in Iowa and the Midwest were obtained from selected references (Iowa State University Extension 1993a,b; Meister Publishing Co. 1994). The diet composition of the potentially beneficial bird species was then characterized by using information primarily from Martin et al. (1951) and the Bent series (see Table 1 for the complete list of references). Diet data for the prairie region of the U. S. were used, if available, otherwise data for the eastern U. S. were used. Species were classified as (1) neutral (i.e., not known to consume weed seeds or harmful insects), (2) infrequent consumers of weed seeds or harmful insects (<5 % of diet), or (3) regular consumers of weed seeds or harmful insects (>5 % of diet).

We used a two-step process to identify the bird species harmful to agriculture in the Midwest. First, we used information about the diets of individual bird species (see Table 1 for references) and about the crops grown in the Midwest (United States Department of Agriculture 1994) to generate a list of bird species that potentially could be harmful to agriculture. The damage categories included: row crops (corn, soybeans, sorghum, sunflowers), small grains (wheat, oats, rice), fruit, fish, poultry, livestock (hogs, cattle, sheep), livestock feed (eating or fouling feed), livestock forage, and nuisance (damage to buildings or trees, nesting in buildings, droppings, roosts). The list of potentially harmful species and their damage categories was then sent to seven individuals (see Acknowledgments) with professional experience in animal damage control. These indi-

viduals were asked to critically review the list and make changes on the basis of their knowledge of animal damage complaints. Damage classifications for bird species were retained on the final list only if two or more of the reviewers concurred that there was a problem. Those instances, in which the damage was thought to occur only rarely, were excluded from the listing.

RESULTS AND DISCUSSION

On the basis of the major food type used during the summer, most bird species that normally breed in Iowa are either insectivores (66 species) or omnivores (48) (Table 1). Eleven species eat predominantly vertebrates, seven are granivores, six are picivores, three each are crustaceovores or herbivores, and one is a vermivore. Most (58) of the bird species feed predominantly on the ground or in low herbaceous vegetation. There are also several species that forage mainly in the air (22), in water (ponds, lakes, rivers, streams) habitats (23), in shrubs or the lower canopy of trees (16), in the upper canopy of trees (13), or on the bark of trees (7). Relatively few species feed predominantly in marshes (3), along shores (2), or on flowers (1).

The ground or herbaceous vegetation is the most commonly used nest substrate by Iowa's breeding birds (43 species), followed by tree branches (36), tree cavities (23), and shrubs or saplings (21) (Table 1). Ten species nest over water and another four nest in stream banks. Seven species use buildings or other man-made structures.

Fifty-six percent of the bird species that breed in Iowa are potential hosts of the brown-headed cowbird (Table 1). Cowbird parasitism is rare or uncommon in 44 species and frequent or regular in 37 species. Most of the species that are frequently or regularly parasitized belong to the Family Emberizidae. The wood warblers (Subfamily Parulinae) and sparrows (Subfamily Emberizinae) are particularly susceptible to this brood parasite. High rates of cowbird parasitism in highly fragmented landscapes in the Midwest could be contributing to the widespread population declines of several species (Robinson et al. 1995a, b).

Most of the birds that breed in Iowa are migratory. Seventy-eight species (54% of the total) are Neotropical migrants, and 45 (31%) are short-distance migrants. Only 22 species are year-round residents in the state.

Most of the bird species prefer wooded habitats (Table 1). Forests are the predominant habitat used by 43 species (30% of the total), and another 40 species (28%) are associated primarily with wooded-edge habitats. Several species show affinities for aquatic habitats. Wetlands are the predominant habitat used by 29 species (20%), and another 10 species (7%) are associated primarily with riparian habitats. Bird use of grassland and cropland in Iowa is similar (Best et al. 1995), and these constitute the major habitat for 16 bird species (11%). Finally, seven species (5%) primarily use areas associated with human habitation (urban/farmstead).

Iowa's breeding bird species differ in their habitat-use specialization during the nesting season. Over half (83 of 145) nest in only one of the four major habitat types (Table 1). Forty-nine species nest in two habitat types, nine in three habitats, and only four in all four. The propensity to specialize also differs among the four habitat types. Of the bird species that nest in forests, 53% (49 of 93) nest only in forests; similarly, of the species that nest in wetlands, 47% (17 of 36) nest only in wetlands. Only 17% (6 of 35) of the species that nest in grasslands nest exclusively in grasslands, and only 18% (11 of 60) of the species that nest in wooded-edge habitats nest only in those habitats. Thus, species that nest in grassland and wooded-edge habitats tend to be more generalized in their choice of nesting habitats than are those that nest in forests and wetlands.

Differences in body mass among species have important implications relative to energetic requirements (Calder 1974), area sensitivity (Freemark et al. 1995), and other effects of spatial patterning (Holling 1992). Allometric analyses have indicated a positive relationship between body size and home range/territory size in birds (Schoener 1968, Holling 1992). Holling (1992: Table A.1, Habitat SE) derived equations that use body mass to estimate home range/territory size for carnivores (C) and herbivores/omnivores (H/O). The equation for the home range/territory size (in ha) for carnivorous birds is $[0.0295(\text{body mass in grams})^{0.51}]^{2.0} \times 100$, and for herbivorous/omnivorous birds it is $[0.00646(\text{body mass})^{0.51}]^{2.0} \times 100$.

The mean body masses of Iowa's breeding birds range from 3 g (ruby-throated hummingbird) to 5,811 g (wild turkey) (Table 1), with estimated home ranges/territories (à la Holling 1992) of 0.01 to 28.8 ha, respectively. Forty-nine species weigh <25 g (home ranges/territories <0.1 ha for H/O), another 48 species weigh 25-100 g (0.1-0.5 ha for H/O, 2.3-9.5 ha for C). Twenty-two species are 101-500 g (0.5-2.4 ha for H/O, 9.5-49.3 ha for C), 15 are 501-1,000 g (2.4-4.8 ha for H/O, 49.4-99.9 ha for C), and 11 are >1,000 g (>4.8 ha for H/O, >99.9 ha for C).

Nearly half of the bird species have either consistently (38 species) or primarily (31) been reported to have a positive area sensitivity (Table 1). These would be the species most adversely affected by habitat fragmentation (Freemark et al. 1995). Only seven species have consistently or primarily been reported to have a negative area sensitivity. These species respond negatively to large habitat patch size, and most have affinities for wooded-edge habitats. For the remaining species, area sensitivity has not been reported either consistently or primarily (40 species) or is unknown (29).

On the basis of analysis of BBS data, 32 of Iowa's breeding bird species have undergone significant regional population declines during 1980-1994, and populations of 39 species have increased significantly (Table 1). For 61 species there was no significant trend during this period, and the sample was inadequate for trend analysis of 13 species. The Partners in Flight prioritizations were available for 57 of the 145 bird species. Priority values range from 1.6 to 4.3 on a 5-point scale, suggesting considerable differences in the level of management concern for these species. There are advantages to both the BBS trend data and the Partners in Flight prioritizations. BBS data are available for most species, whereas the Partners in Flight prioritizations are restricted to Neotropical migratory landbirds. The prioritizations, however, are based on more than BBS trend data (see Methods) and thus represent a more holistic assessment of the status of each species.

Most birds that breed in Iowa are not known to directly benefit agriculture. Seventy-three of the 145 species do not consume pest insects, and 107 do not eat seeds of pest weeds (Table 1). Nearly half (68) of the species consume neither pest insects nor seeds. Based on our evaluations, crop-damaging insects are a regular part of the diet of 49 bird species and are infrequent in the diet of another 23 species. Weed seeds constitute a regular part of the diet in 24 bird species and occur infrequently in the diets of 14 other species. Both pest insects and seeds of pest weeds are regularly eaten by 21 bird species. These species are particularly beneficial to agriculture and consist mainly of sparrows and blackbirds (Family Emberizidae) and upland gamebirds (Family Phasianidae).

Thirty of the 145 bird species (20%) are potentially harmful to agriculture (Table 1). Eighteen species cause nuisance problems, eight cause harm to fruit and eight harm small grains, seven damage row crops, three prey on poultry and three eat fish, two consume livestock forage, and one kills livestock. Some bird species are particularly harmful because they cause several forms of damage. These include the common grackle, red-winged blackbird, American crow, house sparrow, Canada goose, and European starling.

Table 1. Life history and status classifications for 145 bird species that normally breed in Iowa.

Species	Food type[a]	Food substrate[b]	Nest substrate[c]	Cowbird host[d]	Migratory status[e]	Predominant habitat[f]	Habitat specialization[g]	Body mass (g)[h]	Area sensitivity[i]	BBS trend[j]	PIF prioritizations[k]	Beneficial[l]	Harmful[m]
Pied-billed grebe (Podilymbus podiceps)	I	W	W	N	NT	W	1	442	++	0	—	0	0
American bittern (Botaurus lentiginosus)	C	W	W	N	SD	W	1	706	+	0	—	0	0
Least bittern (Ixobrychus exilis)	P	W	W	N	NT	W	1	86	++	?	—	0	0
Great blue heron (Ardea herodias)	P	W	T	N	SD	W	1	2390	+	+	—	0	FI
Great egret (Ardea alba)	C	W	T	N	NT	W	1	874	?	+	—	0	0
Green heron (Butorides striatus)	Cr	W	T	N	NT	R	2	212	(?)	0	—	0	0
Black-crowned night-heron (Nycticorax nycticorax)	P	W	T	N	NT	W	2	883	++	0	—	0	0
Yellow-crowned night-heron (Nycticorax violaceus)	Cr	W	T	N	NT	W	1	683	?	?	—	0	0
Canada goose (Branta canadensis)	H	W	G	N	SD	W	1	4401	++	+	—	0	FO,NU,RC,SG
Wood duck (Aix sponsa)	G	G	C	N	SD	W	2	658	0	+	—	1S	0
Green-winged teal (Anas crecca)	G	W	G	N	NT	W	1	341	++	?	—	0	0
Mallard (Anas platyrhynchos)	G	G	G	N	SD	W	2	1082	++	+	—	1I,2S	NU,SG
Northern pintail (Anas acuta)	G	W	G	N	NT	W	2	1011	++	0	—	1S	0
Blue-winged teal (Anas discors)	O	W	G	N	NT	W	2	386	++	-	—	1S	0
Northern shoveler (Anas clypeata)	O	W	G	N	NT	W	1	613	++	?	—	0	0
Gadwall (Anas strepera)	H	W	G	N	NT	W	1	920	++	?	—	0	0
Redhead (Aythya americana)	H	W	G	N	NT	W	1	1045	++	?	—	0	0
Ring-necked duck (Aythya collaris)	O	W	G	N	NT	W	1	705	0	+	—	0	0
Hooded merganser (Lophodytes cucullatus)	P	W	C	N	NT	W	2	610	?	?	—	0	0
Ruddy duck (Oxyura jamaicensis)	O	W	W	N	NT	W	1	545	++	?	—	0	0
Turkey vulture (Cathartes aura)	C	G	G	N	SD	F	1	1467	-	+	—	0	0
Bald eagle (Haliaeetus leucocephalus)	P	W	T	N	SD	R	1	4740	+	0	—	0	FI,LI
Cooper's hawk (Accipiter cooperii)	C	A	T	N	SD	F	1	439	0	+	—	0	0
Red-shoulder hawk (Buteo lineatus)	C	G	T	N	SD	F	1	559	+	0	—	0	0
Broad-winged hawk (Buteo platypterus)	C	G	T	N	NT	F	1	455	++	0	—	0	0
Swainson's hawk (Buteo swainsoni)	C	G	T	N	NT	E	1	989	?	?	3.00	2I	0
Red-tailed hawk (Buteo jamaicensis)	C	G	T	N	SD	E	1	1126	0	+	—	1I	PO
American kestrel (Falco sparverius)	I	A	C	N	SD	E	2	116	(+)	+	—	2I	0
Gray partridge *[n] (Perdix perdix)	O	G	G	N	R	G	1	390	?	0	—	2I,2S	0
Ring-necked pheasant * (Phasianus colchicus)	O	G	G	N	R	G	3	1135	0	0	—	2I,2S	0
Ruffed grouse (Bonasa umbellus)	O	G	G	N	R	F	1	577	+	+	—	0	0
Wild turkey (Meleagris gallopavo)	O	G	G	N	R	F	1	5811	++	+	—	1I,2S	RC,SG

Table 1. Life history and status classifications for 145 bird species that normally breed in Iowa. (continued)

Species	Food type[a]	Food substrate[b]	Nest substrate[c]	Cowbird host[d]	Migratory status[e]	Predominant habitat[f]	Habitat specialization[g]	Body mass (g)[h]	Area sensitivity[i]	BBS trend[j]	PIF prioritizations[k]	Beneficial[l]	Harmful[m]
Northern bobwhite (Colinus virginianus)	O	G	G	N	R	E	2	178	(?)	0	—	2I,2S	0
King rail (Rallus elegans)	Cr	M	G	N	SD	W	1	361	?	?	—	0	0
Virginia rail (Rallus limicola)	I	M	G	N	NT	W	1	82	(+)	0	—	0	0
Sora (Porzana carolina)	O	W	W	N	NT	W	1	75	(?)	0	—	0	0
American coot (Fulica americana)	O	W	W	N	NT	W	1	642	++	-	—	0	FO,NU
Killdeer (Charadrius vociferus)	I	G	G	N	SD	G	2	97	?	+	—	1I	0
Spotted sandpiper (Actitis macularia)	I	Sh	G	Ra	NT	W	2	40	++	-	—	0	0
Upland sandpiper (Bartramia longicauda)	I	G	G	Ra	NT	G	1	151	+	0	3.14	2I,1S	0
American woodcock (Scolopax minor)	V	G	G	N	SD	F	2	352	?	-	—	0	0
Black tern (Chlidonias niger)	I	W	W	N	NT	W	1	65	++	0	—	0	0
Rock dove* (Columba livia)	O	G	Bu	N	R	U	1	355	?	-	—	1S	LF,NU
Mourning dove (Zenaida macroura)	G	G	T	Ra	SD	E	3	119	(?)	+	—	2S	0
Black-billed cuckoo (Coccyzus erythropthalmus)	I	S	S	Ra	NT	E	2	51	+	0	3.14	0	0
Yellow-billed cuckoo (Coccyzus americanus)	I	S	S	Ra	NT	F	2	64	+	-	3.29	0	0
Eastern screech-owl (Otus asio)	I	G	C	N	R	E	2	181	-	?	—	1I	0
Great horned owl (Bubo virginianus)	C	G	T	N	R	F	1	1543	(+)	0	—	1I	PO
Barred owl (Strix varia)	C	G	C	N	R	F	1	717	(+)	+	—	0	PO
Common nighthawk (Chordeiles minor)	I	A	G	N	NT	G	1	62	?	+	2.29	2I	0
Chuck-will's widow (Caprimulgus carolinensis)	I	A	G	N	NT	F	1	120	0	0	2.43	0	0
Whip-poor-will (Caprimulgus vociferus)	I	A	G	N	NT	F	1	53	0	0	3.29	1I	0
Chimney swift (Chaetura pelagica)	I	A	Bu	N	NT	U	1	24	0	-	2.86	2I	0
Ruby-throated hummingbird (Archilochus colubris)	O	F	T	N	NT	F	2	3	(+)	+	2.57	0	0
Belted kingfisher (Ceryle alcyon)	P	W	B	N	SD	R	1	148	+	0	—	0	FI
Red-headed woodpecker (Melanerpes erythrocephalus)	I	A	C	N	SD	E	2	72	(+)	-	—	2I	NU
Red-bellied woodpecker (Melanerpes carolinus)	I	B	C	N	R	F	1	62	+	+	—	2I	NU
Yellow-bellied sapsucker (Sphyrapicus varius)	O	B	C	N	SD	F	1	50	+	?	—	0	NU
Downy woodpecker (Picoides pubescens)	I	B	C	N	R	F	2	27	+	-	—	0	NU
Hairy woodpecker (Picoides villosus)	I	B	C	N	R	F	1	66	+	0	—	0	NU
Northern flicker (Colaptes auratus)	I	G	C	N	SD	E	2	132	(+)	-	—	2I,1S	NU
Pileated woodpecker (Dryocopus pileatus)	I	B	C	N	R	F	1	287	+	+	—	0	0
Eastern wood-pewee (Contopus virens)	I	A	T	U	NT	F	1	14	+	0	3.29	1I	0
Acadian flycatcher (Empidonax virescens)	I	A	T	U	NT	F	1	13	++	0	3.43	0	0

Table 1. Life history and status classifications for 145 bird species that normally breed in Iowa. (continued)

Species	Food type[a]	Food substrate[b]	Nest substrate[c]	Cowbird host[d]	Migratory status[e]	Predominant habitat[f]	Habitat specialization[g]	Body mass (g)[h]	Area sensitivity[i]	BBS trend[j]	PIF prioritizations[k]	Beneficial[l]	Harmful[m]
Willow flycatcher (Empidonax traillii)	I	A	S	F	NT	E	2	13	?	?	2.86	0	0
Least flycatcher (Empidonax minimus)	I	A	T	U	NT	F	1	10	++	0	2.71	1I	0
Eastern phoebe (Sayornis phoebe)	I	A	Bu	Re	SD	R	2	20	+	+	—	1I	0
Great crested flycatcher (Myiarchus crinitus)	I	A	C	U	NT	F	1	34	+	0	3.29	0	0
Western kingbird (Tyrannus verticalis)	I	A	T	Ra	NT	E	2	40	0	0	2.43	2I	0
Eastern kingbird (Tyrannus tyrannus)	I	A	T	U	NT	E	3	44	(+)	-	2.43	2I	0
Horned lark (Eremophila alpestris)	O	G	G	U	SD	G	1	31	++	0	—	2I,2S	0
Purple martin (Progne subis)	I	A	C	N	NT	U	1	49	-	-	3.00	1I	0
Tree swallow (Tachycineta bicolor)	I	A	C	Ra	SD	E	3	20	?	0	—	1I,1S	0
Northern rough-winged swallow (Stelgidopteryx serripennis)	I	A	B	N	NT	R	1	16	?	0	2.14	1I	0
Bank swallow (Riparia riparia)	I	A	B	N	NT	R	1	15	?	0	2.57	1I	0
Cliff swallow (Hirundo pyrrhonota)	I	A	Bu	Ra	NT	R	1	22	?	0	2.29	1I	0
Barn swallow (Hirundo rustica)	I	A	Bu	Ra	NT	U	1	16	(-)	-	2.14	2I	NU
Blue jay (Cyanocitta cristata)	O	G	T	Ra	R	F	2	87	(+)	-	—	2I	FR,NU
American crow (Corvus brachyrhynchos)	O	G	T	Ra	R	E	2	448	(+)	+	—	2I	FR,NU,RC,SG
Black-capped chickadee (Parus atricapillus)	I	S	C	Ra	R	F	2	11	(+)	0	—	1I	0
Tufted titmouse (Parus bicolor)	I	S	C	Ra	R	F	1	22	+	+	—	0	0
White-breasted nuthatch (Sitta carolinensis)	I	B	C	Ra	R	F	1	21	+	0	—	0	0
Brown creeper (Certhia americana)	I	B	T	Ra	SD	F	1	8	+	0	—	0	0
Carolina wren (Thryothorus ludovicianus)	I	S	C	U	R	F	1	19	0	+	—	1I	0
House wren (Troglodytes aedon)	I	S	C	Ra	NT	E	2	11	(?)	+	1.57	2I	0
Sedge wren (Cistothorus platensis)	I	G	G	N	SD	G	2	9	(+)	0	—	2I	0
Marsh wren (Cistothorus palustris)	I	M	W	N	SD	W	1	11	++	-	—	0	0
Blue-gray gnatcatcher (Polioptila caerulea)	I	T	T	F	NT	F	1	6	++	+	2.43	0	0
Eastern bluebird (Sialia sialis)	I	G	C	U	SD	E	2	32	++	+	—	2I	0
Veery (Catharus fuscescens)	O	G	G	F	NT	F	1	31	++	-	3.29	1I	0
Wood thrush (Hylocichla mustelina)	O	G	S	Re	NT	F	1	47	++	0	3.57	0	0
American robin (Turdus migratorius)	O	G	T	U	SD	E	2	77	(-)	+	—	2I	FR
Gray catbird (Dumetella carolinensis)	O	G	S	U	NT	E	2	37	(-)	+	2.86	2I	FR
Northern mockingbird (Mimus polyglottos)	O	G	S	U	SD	E	1	49	--	+	—	0	0
Brown thrasher (Toxostoma rufum)	O	G	S	U	SD	E	3	69	(?)	-	—	2I	0
Cedar waxwing (Bombycilla cedrorum)	O	A	T	U	SD	E	1	32	(+)	0	—	0	FR

Table 1. Life history and status classifications for 145 bird species that normally breed in Iowa. (continued)

Species	Food type[a]	Food substrate[b]	Nest substrate[c]	Cowbird host[d]	Migratory status[e]	Predominant habitat[f]	Habitat specialization[g]	Body mass (g)[h]	Area sensitivity[i]	BBS trend[j]	PIF prioritizations[k]	Beneficial[l]	Harmful[m]
Loggerhead shrike (Lanius ludovicianus)	C	G	S	N	SD	E	1	47	?	-	—	2I	0
European starling * (Sturnus vulgaris)	O	G	C	Ra	R	U	2	82	(?)	0	—	2I,1S	FR,LF,NU
White-eyed vireo (Vireo griseus)	I	S	S	F	NT	E	2	11	(+)	0	3.14	0	0
Bell's vireo (Vireo bellii)	I	T	S	Re	NT	E	2	9	?	0	3.43	0	0
Yellow-throated vireo (Vireo flavifrons)	I	T	T	F	NT	F	1	18	+	+	3.00	0	0
Warbling vireo (Vireo gilvus)	I	T	T	F	NT	R	1	15	+	0	2.57	0	0
Red-eyed vireo (Vireo olivaceus)	I	T	T	Re	NT	F	1	17	+	+	2.14	1I	0
Blue-winged warbler (Vermivora pinus)	I	S	G	F	NT	E	2	8	?	0	3.57	0	0
Northern parula (Parula americana)	I	T	T	U	NT	F	1	9	+	0	2.57	0	0
Yellow warbler (Dendroica petechia)	I	S	S	Re	NT	E	3	10	(+)	+	1.57	0	0
Yellow-throated warbler (Dendroica dominica)	I	T	T	Ra	NT	F	1	9	0	0	2.86	0	0
Cerulean warbler (Dendroica cerulea)	I	T	T	U	NT	F	1	9	++	-	4.29	0	0
American redstart (Setophaga ruticilla)	I	S	S	F	NT	F	1	8	+	0	2.86	0	0
Prothonotary warbler (Prorонotaria citrea)	I	S	C	F	NT	R	1	16	+	0	3.57	0	0
Worm-eating warbler (Helmitheros vermivorus)	I	G	G	U	NT	F	1	13	++	0	3.29	0	0
Ovenbird (Seiurus aurocapillus)	I	G	G	Re	NT	F	1	19	++	+	3.14	0	0
Louisiana waterthrush (Seiurus motacilla)	I	Sh	B	F	NT	R	1	20	++	+	3.00	0	0
Kentucky warbler (Oporornis formosus)	I	G	G	F	NT	F	1	14	+	0	3.14	0	0
Common yellowthroat (Geothlypis trichas)	I	S	G	Re	NT	E	4	10	(?)	-	2.29	1I	0
Yellow-breasted chat (Icteria virens)	O	S	S	Re	NT	E	1	25	0	0	3.00	0	0
Summer tanager (Piranga rubra)	I	T	T	F	NT	F	1	28	++	0	3.00	0	0
Scarlet tanager (Piranga olivacea)	I	T	T	Re	NT	F	1	29	++	0	3.00	1I	0
Northern cardinal (Cardinalis cardinalis)	O	G	S	Re	R	E	2	45	(-)	+	—	2I,1S	0
Rose-breasted grosbeak (Pheucticus ludovicianus)	O	T	S	F	NT	F	2	46	+	-	3.14	2I,1S	0
Blue grosbeak (Guiraca caerulea)	O	G	S	F	NT	E	1	28	-	0	2.57	2I,1S	0
Indigo bunting (Passerina cyanea)	O	S	S	Re	NT	E	2	15	(-)	-	2.86	2I,2S	0
Dickcissel (Spiza americana)	O	G	G	Re	NT	G	2	27	+	0	3.57	2I,1S	0
Eastern towhee (Pipilo erythrophthalmus)	O	G	G	Re	SD	E	2	41	-	0	—	2I,2S	0
Chipping sparrow (Spizella passerina)	O	G	S	Re	NT	E	1	12	(-)	+	1.86	2I,2S	0
Field sparrow (Spizella pusilla)	O	G	G	F	SD	E	3	13	(+)	-	—	2I,2S	0
Vesper sparrow (Pooecetes gramineus)	O	G	G	F	SD	G	2	26	++	-	—	2I,2S	0
Lark sparrow (Chondestes grammacus)	O	G	S	F	NT	G	1	29	++	0	2.86	2I,2S	0

Table 1. Life history and status classifications for 145 bird species that normally breed in Iowa. (continued)

Species	Food type[a]	Food substrate[b]	Nest substrate[c]	Cowbird host[d]	Migratory status[e]	Predominant habitat[f]	Habitat specialization[g]	Body mass (g)[h]	Area sensitivity[i]	BBS trend[j]	PIF prioritizations[k]	Beneficial[l]	Harmful[m]
Savannah sparrow (Passerculus sandwichensis)	O	G	G	U	SD	G	2	20	++	0	—	2I,2S	0
Grasshopper sparrow (Ammodramus savannarum)	O	G	G	F	NT	G	2	17	++	-	3.43	2I,2S	0
Henslow's sparrow (Ammodramus henslowii)	O	G	G	F	SD	G	1	13	++	-	—	2I,2S	0
Song sparrow (Melospiza melodia)	O	S	S	Re	SD	E	4	21	(?)	+	—	2I,2S	0
Swamp sparrow (Melospiza georgiana)	O	G	W	F	SD	W	2	17	+	+	—	2I,2S	0
Bobolink (Dolichonyx oryzivorus)	O	G	G	U	NT	G	2	42	++	-	3.43	2I,2S	0
Red-winged blackbird (Agelaius phoeniceus)	O	G	G	F	SD	W	4	53	(-)	-	—	2I,2S	LF,NU,RC,SG
Eastern meadowlark (Srurnella magna)	I	G	G	U	SD	G	2	89	+	0	—	2I,1S	0
Western meadowlark (Sturnella neglecta)	I	G	G	U	SD	G	2	101	++	0	—	2I	0
Yellow-headed blackbird (Xanthocephalus xanthocephalus)	O	G	W	Ra	NT	W	1	65	0	-	2.71	2I,2S	RC,SG
Common grackle (Quiscalus quiscula)	O	G	T	Ra	SD	E	3	114	0	-	—	2I,2S	FR,LF,NU,RC,SG
Brown-headed cowbird (Molothrus ater)	O	G	—	—	SD	E	4	44	(+)	0	—	2I,2S	LF,NU,RC,SG
Orchard oriole (Icterus spurius)	I	T	T	F	NT	E	2	20	-	0	2.86	1I	0
Baltimore oriole (Icterus galbula)	O	T	T	U	NT	E	2	34	(+)	-	2.86	2I	0
House finch * (Carpodacus mexicanus)	G	G	Bu	U	SD	U	1	21	?	+	—	0	FR,NU
American goldfinch (Carduelis tristis)	O	S	S	U	SD	E	3	13	(?)	0	—	2I,2S	0
House sparrow * (Passer domesticus)	G	G	Bu	Ra	R	U	2	28	(-)	-	—	1I,1S	LF,NU,RC,SG

[a] Food type: I = insectivore, Cr = crustaceovore, V = vermivore, C = carnivore, P = piscivore, G = granivore, H = herbivore, and O = omnivore.

[b] Food substrate: G = ground or low herbaceous, S = shrubs or lower canopy of trees, T = upper canopy of trees, B = bark of trees, F = flowers, W = water, M = marsh, Sh = shore, and A = air.

[c] Nest substrate: G = ground or herbaceous vegetation, S = shrubs or saplings, T = tree branches, C = tree cavities, B = stream banks, W = herbaceous vegetation over water, and Bu = buildings or other man-made structures.

[d] Cowbird host: N = no, Ra = rare, U = uncommon, F = frequent, and Re = regular.

[e] Migratory status: NT = Neotropical migrant, SD = short-distance migrant, and R = resident year round.

[f] Predominant habitat: E = Wooded Edge (forest edge, shrubland, old field), F = Forest (deciduous or coniferous), G = Grassland/Cropland, R = Riparian (usually wooded), U = Urban/Farmstead, and W = Wetland.

[g] Habitat specialization: Nests in how many of four major habitat types (grassland, wetland, wooded edge, and forest).

[h] Body mass: Represent mean values; males and females were weighted equally in determining means for sexually dimorphic species.

[i] Area sensitivity: ++ = consistently positive area sensitivity (bird abundance, frequency of occurrence, or nest success greater with increasing habitat patch size);+ = primarily positive area sensitivity but some studies detected none; (+) = primarily no area sensitivity but some studies detected positive area sensitivity; -- = consistently negative area sensitivity (bird abundance, frequency of occurrence, or nest success decrease with increasing habitat patch size); - = primarily negative area sensitivity but some studies detected none; (-) = primarily no area sensitivity but some studies detected negative area sensitivity; 0 = consistently no area sensitivity; (?) = area sensitivity unknown because of contradictory results; and ? = area sensitivity unknown because it has not been studied. References: Askins et al. 1987, Blake and Karr 1987, Brown and Dinsmore 1986, Dobkin and Wilcox 1986, Gibbs et al. 1991, Gutzwiller and Anderson 1987, Hamel et al. 1982, Harris and Wallace 1984, Hejl and Paige 1994, Herkert 1994, Johns 1993, Johnson and Temple 1990, Keller et al. 1993, Martin 1981, Robbins et al. 1989, Rosenberg and Raphael 1986, Samson 1980a, b, Stauffer and Best 1980, Temple 1986, Tyser 1983, Vickery et al. 1994.

[j] Breeding Bird Survey (BBS) trend data: + = significant positive trend, - = significant negative trend, 0 = no significant trend, and ? = inadequate sample for trend analysis.

[k] Partners in Flight prioritizations. Criteria for prioritization are discussed in the text. - = species not prioritized.

[l] Beneficial: 0 = does not consume harmful insects or weed seeds, 1I = harmful insects present but infrequent in diet (< 5%), 2I = harmful insects regular part of diet (> 5%), 1S = weed seeds present but infrequent in diet (< 5%), and 2S = weed seeds regular part of diet (>5%). References: Austin 1968; Beal 1911; Bent 1921, 1923, 1925, 1926, 1927, 1929,1932, 1937, 1938, 1939, 1940, 1942, 1946, 1948, 1949, 1950, 1953, 1958; Courtsal 1983; Martin et al. 1951.

[m] Harmful: RC = row crops (corn, soybeans, sorghum, sunflowers); SG = small grains (wheat, oats, rice, barley, rye); FR = fruit; FI = fish; PO = poultry; LI = livestock (hogs, cattle, sheep); NU = Nuisance (damage to buildings or trees, nesting in buildings, droppings, roosts); LF = livestock feed (eating or fouling feed); and FO = forage for livestock. 0 = not harmful to agriculture. References: Dolbeer 1983, Hygnstrom and Craven 1983, Johnson and Altman 1983, Marsh 1983, Pfeier 1983, Salmon and Conte 1981, Wade 1983, plus references listed under Beneficial.

n* = non-native species introducted to the Midwest.

APPLICATIONS OF THE CLASSIFICATIONS

The life history and status classifications developed and synthesized in this report potentially can be used in many ways and in many contexts. Below we illustrate three applications of such information: (1) comparing individual species' differences and similarities relative to life history traits and status, (2) evaluating interrelationships among the various life history and status classification variables, and (3) providing additional insights into the interpretation of research results previously reported.

Comparisons among Species

Individual bird species, even closely related ones, differ in important ways that may relate to their habitat and life history requirements, population status, management/conservation needs, potential to benefit or harm agriculture, etc. Two examples will be given to illustrate how interspecific comparisons can be made by using the data in Table 1.

The gray catbird and brown thrasher are members of the same family (Mimidae), and they are similar in several respects. Both are ground-foraging omnivores, both nest primarily in shrubs and saplings, both are associated primarily with wooded-edge habitats, and both are uncommon hosts of the brown-headed cowbird. There are, however, important differences between the two species. The catbird is a Neotropical migrant; the thrasher is a short-distant migrant. The thrasher is more generalized in its habitat-use patterns. Catbird populations in the Midwest have increased significantly in recent years, whereas thrasher populations have declined. The catbird is considered a problem species in some areas because of its damage to fruit crops. These differences could be important considerations when making management or conservation decisions for these species.

Another interesting comparison is the savannah sparrow and the song sparrow. Both species are omnivores, are short-distance migrants, and benefit agriculture by regularly consuming pest insects and weed seeds. There are, however, important differences between the two species. The savannah sparrow is predominantly a grassland species, whereas the song sparrow is a habitat generalist. The savannah sparrow nests and forages predominantly on the ground or in herbaceous vegetation; the song sparrow primarily uses shrubs or saplings as nesting and feeding sites. Savannah sparrows are uncommon hosts of the brown-headed cowbird, whereas song sparrows are regular hosts. Savannah sparrows have consistently been reported to be area sensitive; results for the song sparrow are equivocal. Savannah sparrow populations in the Midwest have remained relatively stable, but those of the song sparrow have increased significantly. On the basis of the life history and status classifications in Table 1, the savannah sparrow probably merits greater management concern than the song sparrow.

Relationships among Classification Variables

Although the relationships among the various life history and status classification variables are often poorly understood, such information is useful in identifying life-history patterns and in providing other insights that may guide management and conservation decisions (Hansen and Urban 1992). Five examples will be given to demonstrate what can be gained from evaluating such relationships.

High levels of cowbird parasitism are currently a major conservation concern in the Midwest (Robinson et al. 1995a, b). The prevalence of parasitism by brown-headed cowbirds is related to bird species' habitat affinities and nest substrate preferences. The greatest proportions of bird species whose predominant habitat is either wooded edge or grassland are cowbird hosts (79 and 69%, respectively); relatively few (14%) wetland bird species are parasitized (Table 1). Cowbird parasitism is particularly prevalent among species whose primary nest substrate is shrubs or saplings – 95% of these species are cowbird hosts. Sixty-four and 47% of the species that nest primarily on tree branches or on the ground/herbaceous vegetation, respectively, are parasitized. A smaller proportion of the species (35%) that use other natural nest substrates (tree cavities, stream banks, herbaceous vegetation over water) are cowbird hosts.

Bird species area sensitivities are related to their habitat affinities and body mass (i.e., home range/territory size). Very few species (5%) whose predominant habitat is wooded edge have been consistently or primarily reported to have a positive area sensitivity (Table 1). Conversely, most of the species (68%) with affinities for forest, grassland, wetland, or riparian habitats have been consistently or primarily reported to be positive area sensitive. The mean body mass of bird species that have been consistently or primarily reported to have a positive area sensitivity is 429 g (estimated home range/territory size of 2.0 ha for H/O, 42.2 ha for C; Holling 1992), whereas the mean body mass for all other species (excluding those whose area sensitivities are unknown) is 214 g (estimated home range/territory size of 1.0 ha for H/O, 20.7 ha for C). Thus, species with affinities for wooded-edge habitats tend to be less adversely affected by reductions in habitat patch size than other species in general, and species with larger body sizes (and home ranges/territories) tend to be more adversely affected (see also Freemark et al. 1995, Faaborg et al. 1995).

The relationships between the population trends of bird species and their relative benefits to agriculture provide insights into the role of birds in pest management. In this regard the news is not encouraging. Fifty-nine percent of the bird species that are declining, according to BBS trend data, regularly include harmful insects in their diet, whereas only 31% of the bird species that are increasing, regularly consume harmful insects (Table 1). Twenty-eight percent of the bird species with declining populations regularly consume weed seeds, yet only 15% of the species that are increasing regularly eat harmful weed seeds.

The migratory status of Iowa's breeding birds is related to their population trends and differs among species with various habitat affinities. Forty-one and 38% of the resident and short-distance migrant species, respectively, are increasing according to BBS trend data, whereas only 17% of the Neotropical migrants are increasing (Table 1). The greatest proportion of year-round residents occurs in species whose primary habitat is urban/farmstead (43%) or forest (30%). No species with affinities primarily for wetland or riparian habitats are year-round residents in Iowa. The greatest proportion of short-distance migrants is found in species that primarily use grassland/cropland or wooded-edge habitats (50 and 45%, respectively). Neotropical migrants are most prevalent among species with affinities for wetland, riparian, or forest habitats (69, 70, and 56%, respectively).

And finally, some insight can be gained by comparing bird species' habitat affinities and their Partners in Flight prioritizations. The Partners in Flight prioritizations average higher for species with affinities for grassland/cropland (3.12) and forests (3.04) than for those primarily using wooded-edge (2.68) and riparian (2.69) habitats (Table 1). (Too few species showed affinities for the other habitats for meaningful comparisons.) This would suggest the need for greater concern for land-use and management practices in grassland/cropland and forest habitats.

Interpreting Previous Research

The life history and status classifications can be useful in interpreting research findings that have been reported previously. For example, the merits of various land-use practices can be evaluated with new insights by considering the life history traits and status of the species affected. Two examples illustrate this.

Best (1983) noted that fencerows with greater woody cover support a more diverse and abundant avifauna than those with predominantly herbaceous cover. The continuing trend on intensively managed farms, however, is to control or remove woody vegetation from

fencerows. The relative merits of retaining woody vegetation in fencerows are bolstered when the potential benefits of the added bird species are considered (Table 1). During the breeding (and crop growing) season, herbaceous fencerows may be used by seven bird species that regularly feed on insects harmful to agricultural crops, whereas fencerows containing scattered trees and shrubs may have as many as 17 such species (Best and Hill 1983, Best et al. 1995).

Two uncultivated habitats commonly associated with agricultural cropland in Iowa are roadsides and grassed waterways. Both are relatively narrow strip-cover habitats, both have similar micro-topography (i.e., are depressions), and both are typically dominated by smooth brome (*Bromus inermis*). Despite the similarities in these two habitats, abundances of several bird species differ dramatically between the two habitats (Bryan and Best 1991, Camp and Best 1993). The explanation for some of these differences can be found by considering the information in Table 1. For example, the grasshopper sparrow was one of the five most abundant species found in grassed waterways but was rarely observed in roadsides. Likewise, western meadowlarks and dickcissels were more abundant in waterways than in roadsides. One possible explanation for these differences relates to area sensitivity – all three species have been reported to be area sensitive (Table 1). Grassed waterways in the Iowa study were 9-30 m wide, whereas the roadways were only 6-8 m wide.

The presence of waterways and roadsides greatly increases bird abundance in agricultural landscapes dominated by rowcrops (Bryan and Best 1991, Camp and Best 1993), but to evaluate the relative benefits versus costs of those increases to farmers requires an understanding of the food habits of the bird species involved. Waterways and roadsides differ in the prevalence of harmful birds. Red-winged blackbirds and brown-headed cowbirds are among the most troublesome species to agriculture (Table 1). These two species composed more than 65% of the total bird abundance in roadsides but less than 30% in grassed waterways (Bryan and Best 1991, Camp and Best 1993). Comparisons such as this are informative in evaluating the relative merits of various habitats and land-use practices.

In this report we have synthesized information from a wide variety of sources to summarize life history and status classifications for 145 bird species that breed in Iowa. This database is not only informative in and of itself, but it can be used to interpret other research findings and provide input for more enlightened conservation and management decisions for Iowa's birdlife. The information presented in Table 1 is by no means exhaustive, and, hopefully, it will provide impetus for others to expand upon what we have done.

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