



192

# SELECTED BIBLIOGRAPHY ON THE FOOD HABITS OF NORTH AMERICAN BLACKBIRDS



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# SELECTED BIBLIOGRAPHY ON THE FOOD HABITS OF NORTH AMERICAN BLACKBIRDS

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## ABSTRACT

This bibliography lists 261 references on the food habits of nine North American blackbird species (Icteridae) and on related subjects such as examination techniques, seed dispersal, and sources of bias. The references, which include those published through 1974, are listed alphabetically by author, and brief annotations are given for most of them.

## INTRODUCTION

This bibliography was compiled as the basis for a thorough review of the literature, published through 1974, on the food habits of North American blackbirds. Most of the references are briefly annotated; the exceptions are minor articles whose contents are clear from their titles.

References on the following icterid species are included: red-winged blackbird (*Agelaius phoeniceus*), tricolored blackbird (*A. tricolor*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), brown-headed cowbird (*Molothrus ater*), Brewer's blackbird (*Euphagus cyanocephalus*), rusty blackbird (*E. carolinus*), common (purple, bronzed) grackle (*Quiscalus quiscula*), great-tailed grackle (*Cassidix mexicanus*), and boat-tailed grackle (*C. major*). The bronzed cowbird (*Tangavius aeneus*) is not included because it is primarily a Central American species; "cowbird" in the annotations refers to the brown-headed cowbird only. *Cassidix mexicanus* has only recently been divided into two species, the great-tailed and boat-tailed grackles (32nd Supplement to the AOU Check-List, *Auk* 90(2):411-419). Where possible, the annotations indicate which of these two species were studied; otherwise, they are called "great- and boat-tailed grackles." In annotations, "blackbirds" refers collectively to the icterid species listed above; in some references the authors were not more specific.

The references cited are from a number of sources including, but not limited to, books, periodicals, theses, and various indexes such as *Wildlife Review* (U.S. Fish and Wildlife Service). Theses and unpublished reports with reasonable availability to the interested researcher are included. The references, listed alphabetically by author, have been divided into two groups; those directly related to blackbird food habits and those indirectly related (e.g., techniques of analysis, potential sources of bias, etc.). An asterisk preceding the citation indicates that we have not inspected the article; for these the source from which the reference was obtained is cited. We have carefully read and verified the citations for all other references but, of course, retain responsibility for any errors.

Willis C. Royall, Jr., Robert T. Mitchell, Charles P. Stone, and Ann H. Jones reviewed early drafts and offered many helpful suggestions and additions. Deborah A. Eaton located and reverified several citations and Ruth E. McNeal typed the manuscript.

## FOOD HABITS REFERENCES

- Alcock, J. 1972. The feeding response of hand-reared red-winged blackbirds (*Agelaius phoeniceus*) to a stinkbug (*Euschistus conspersus*). *Am. Midl. Nat.* 89(2):307-313.  
(Attacked the distasteful insect the first two times it was introduced.)
- Alexander, H. E. 1960. The state game and fish department and bird depredations. *Trans. North Am. Wildl. Nat. Resour. Conf.* 25:111-113.  
(Brief mention of blackbird foods as found by other workers.)
- Allen, A. A. 1914a. The red-winged blackbird: A study in the ecology of a cat-tail marsh. *Proc. Linn. Soc. N. Y.* 24-25:43-128.  
(Refers to earlier authors for general food habits, but this paper contains one of the earliest comprehensive listings of insect taxa used as food by the redwing. The redwing is not restricted to marsh habitat as a food source.)
- Allen, A. A. 1914b. Birds in their relation to agriculture in New York State. *Cornell Reading-Courses* 4(76):18-56.  
(Cites redwing as feeding on locusts, cutworms, armyworms, and weed seeds.)
- Anonymous. 1962. Crop pests included in blackbirds' regular diet. *Crops Soils* 14(9):32.  
(Stomachs of 500 blackbirds—mostly redwings—collected in Canada during the spring months contained many insects considered agricultural pests.)
- Audubon, J. J. 1831. *Ornithological biography*. Vol. 5. Adam and Charles Black, Edinburgh, 664 pp.  
(One of the earliest works to mention food items found in blackbird stomachs. Covers all blackbird species and refers to letters from early naturalists about observations of feeding.)
- Bailey, V. 1905. Birds known to eat the boll weevil. *U.S. Dep. Agric. Biol. Surv. Bull.* 22. 16 pp.  
(Redwings and cowbirds were among several bird species eating weevils.)
- Baird, J., and A. J. Meyerriecks. 1965. Birds feeding on an ant mating swarm. *Wilson Bull.* 77(1):89-91.  
(Redwings and common grackles were among 13 bird species eating flying ants in Massachusetts.)
- Baird, S. F., T. M. Brewer, and R. Ridgeway. 1874. *A history of North American birds*. Vol. 2. Little, Brown, and Co., Boston. 590 pp.  
(This early work includes a general discussion on the food of each blackbird species as known at that time.)
- Baker, W. A., W. G. Bradley, and C. A. Clark. 1949. Biological control of the European corn borer in the United States. *U.S. Dep. Agric. Tech. Bull.* 983. 185 pp.  
(Redwings, common grackles, and rusty blackbirds were observed feeding on this insect pest.)
- Bartlett, L. M. 1956. Observations on birds "hawking" insects. *Auk* 73(1):127-128.  
(Common grackles were observed flycatching insects.)
- Beal, F.E.L. 1895. The crow blackbirds and their food. Pages 233-248 in *Yearbook of Agriculture*, 1894. U.S. Department of Agriculture, Washington, D.C.  
(Food of common grackles was about 50% animal and 50% vegetable.)

- Beal, F.E.L. 1897. Some common birds in their relation to agriculture. U.S. Dep. Agric. Farmers' Bull. 54. 40 pp.  
(Food of redwings and common grackles.)
- Beal, F.E.L. 1898. Birds that injure grain. Pages 345-354 in Yearbook of Agriculture, 1897. U.S. Department of Agriculture, Washington, D.C.  
(Discusses foods of the redwing and other icterids, but is essentially a preliminary report of the next reference.)
- Beal, F.E.L. 1900. Food of the bobolink, blackbirds, and grackles. U.S. Dep. Agric. Biol. Surv. Bull. 13. 77 pp.  
(The first major work on the food habits of blackbirds. Covers all species except the tricolor. Used the estimated percent volume method of analysis, which allows comparison with many later papers.)
- Beal, F.E.L. 1905. The relation of birds to fruit growing in California. Pages 241-253 in Yearbook of Agriculture, 1904. U.S. Department of Agriculture, Washington, D.C.  
(Brewer's blackbirds ate cherries and insects in cherry orchards.)
- Beal, F.E.L. 1909. The relations between birds and insects. Pages 343-350 in Yearbook of Agriculture, 1908. U.S. Department of Agriculture, Washington, D.C.  
(Birds are beneficial because they consume large numbers of insects. Scattered references to insect consumption by blackbirds.)
- Beal, F.E.L. 1910. Birds of California in relation to the fruit industry. Part II. U.S. Dep. Agric. Biol. Surv. Bull. 34. 94 pp.  
(Economic relations between birds and agriculture. Includes the bicolored redwing and Brewer's blackbirds.)
- Beal, F.E.L. 1915. Some common birds useful to the farmer. U.S. Dep. Agric. Farmers' Bull. 630. 29 pp.  
(Mentions foods of the common grackle, redwing, and Brewer's.)
- Beal, F.E.L. 1948. Some common birds useful to the farmer. U.S. Fish Wildl. Serv. Conserv. Bull. 18. 28 pp.  
(An updated revision of Beal 1915.)
- Beall, G. H. 1967. The blackbird menace. Rice J., May:26-27.  
(Depredations by blackbirds on rice.)
- Beasley, L. E., and S. W. Carothers. 1974. Unusual feeding habits in two species of blackbirds. Wilson Bull. 86(4):478-479.  
(Redwings and Brewer's ate young leopard frogs and subadult voles.)
- Beecher, W. J. 1950. Convergent evolution in the American orioles. Wilson Bull. 62(2):51-86.  
(Discusses evolutionary adaptations of the bill and jaw musculature of icterids in relations to their food habits.)
- Beecher, W. J. 1951. Adaptations for food-getting in the American blackbirds. Auk 68(4):411-440.  
(The relationship of the food habits of icterids to their bill shape and other cephalic adaptations. Includes summary of the food habits work of other authors.)



- Beeton, A. M., and L. Wells. 1957. A bronzed grackle (*Quiscalus quiscula*) feeding on live minnows. *Auk* 74(2):263-264.
- Bent, A. C. 1958. Life histories of North American blackbirds, orioles, tanagers, and allies. U.S. Natl. Mus. Bull 211. 549 pp. (Reprinted by Dover Publications, Inc., New York, 1965.) (Summarizes the foods of all North American blackbird species. Relies primarily on the available literature.)
- Besser, J. F., J. W. De Grazio, and J. L. Guarino. 1968. Costs of wintering starlings and red-winged blackbirds at feedlots. *J. Wildl. Manage.* 32(1):179-180. (Cost of cattle rations eaten by each species at feedlots.)
- Bird, R. D. 1961. Ecology of the aspen parkland of western Canada in relation to land use. Can. Dep. Agric. Res. Branch Publ. 1066. 155 pp. (Food of the redwing in the Canadian parkland.)
- Bird, R. D., L. B. Smith. 1964. The food habits of the red-winged blackbird, *Agelaius phoeniceus*, in Manitoba. *Can. Field Nat.* 78(3):179-186. (Demonstrates a negative correlation between insects and grit.)
- Blankinship, D. R. 1966. The relationship of white-winged dove production to control of great-tailed grackles in the lower Rio Grande Valley of Texas. *Trans. North Am. Wildl. Nat. Resour. Conf.* 31:45-58. (Great-tailed grackles eat large numbers of white-winged dove eggs and nestlings.)
- Brenner, F. J. 1966. Energy and nutrient requirements of the red-winged blackbird. *Wilson Bull.* 78(1):111-120. (Existence energy requirements of redwings.)
- Brenner, F. J. 1967. Seasonal correlations of reserve energy of the red-winged blackbird. *Bird-Banding* 38(3):195-211.
- Brenner, F. J. 1968. Energy flow in two breeding populations of red-winged blackbirds. *Am. Midl. Nat.* 79(2):289-310. (Energy requirements of nestlings and breeding adults.)
- Brenner, F. J., and W. F. Malin. 1965. Metabolism and survival time of the red-winged blackbird. *Wilson Bull.* 77(3):282-289. (Metabolic rates and reserve energy supplies in redwings.)
- Bruner, L. 1896. Some notes on Nebraska birds. Pages 48-178 in Report of the Nebraska State Horticultural Society (Lincoln, Nebr.) for the year 1896. (Stresses benefits of insect-eating habits of redwings. Also discusses foods of cowbirds and common grackles.)
- Bryant, H. C. 1911. The relation of birds to an insect outbreak in northern California during the spring and summer of 1911. *Condor* 13(4):195-208. (Brewer's blackbirds were the most important predator species during an insect outbreak. Believed that birds were an important natural check during this outbreak.)
- Bryant, H. C. 1912. Birds in relation to a grasshopper outbreak in California. *Univ. Calif. Publ. Zool.* 11(1):1-20. (Established that a bird will feed on the insect group most available. Calculated that a 200-bird flock of redwings ate enough grasshoppers to save the alfalfa farmer at least \$20 per year in insect damage.)

- Burleigh, T. D. 1938. The relation of birds to the establishment of longleaf pine seedlings in southern Mississippi. U.S. For. Serv. South. For. Exp. Stn. Occas. Pap. 75. 5 pp.  
(Red-winged blackbird depredations.)
- Burrill, A. C. 1913. Economic and biologic notes on the giant midge: *Chironomus (Tendipes) plumosus* Meigen. Bull. Wis. Nat. Hist. Soc. 10(3-4):124-163.  
(Redwings mentioned as a predator of this insect.)
- Cade, T. J. 1953. Aerial feeding of the rusty blackbird on mosquitoes. Wilson Bull. 65(1):52-53.
- Campbell, R. W. 1974. Rusty blackbirds prey on sparrows. Wilson Bull. 86(3):291-293.  
(Attacked tree sparrows, white-crowned sparrows, and possibly a lapland longspur.)
- Cardinell, H. A., and D. W. Hayne. 1944. Damage to corn by red-wings. Mich. Agric. Exp. Stn. Q. Bull. 27(1):26-34.  
(Food, feeding behavior, and depredations in the cornfields of Michigan.)
- Cardinell, H. A., and D. W. Hayne. 1945. Corn injury by red-wings in Michigan. Mich. Agric. Exp. Stn. Tech. Bull. 198. 59 pp.
- Christofferson, K. 1927. The bronzed grackle as a bird of prey. Bird-Lore 29(2):119.  
(Common grackles killed two pine siskins and a barn swallow. They consumed part of the pine siskins.)
- Clark, G. A., Jr. 1971. The occurrence of bill-sweeping in the terrestrial foraging of birds. Wilson Bull. 83(1):66-73.  
(Common grackles swept their bills through litter to uncover food items.)
- Collier, G. 1968. Annual cycle and behavioral relationships in the red-winged and tricolored blackbirds of southern California. Ph.D. Thesis. Univ. Calif., Los Angeles. 374 pp.  
(The rate at which food was brought to nestlings of both species is recorded and discussed.)
- Coppinger, L. L. 1967. The role of the avian visual system in crop depredation, with special reference to the redwinged blackbird. M.S. Thesis. Univ. Mass., Amherst. 121 pp.  
(Reviews much of the literature on the food habits of red-wings.)
- Cottam, C. 1943. Unusual feeding habit of grackles and crows. Auk 60(4):594-595.  
(Common grackles fed on small fish like gulls and terns.)
- Cottam, C., and F. M. Uhler. 1942. Birds as a factor in controlling insect depredations. U.S. Fish Wildl. Serv. Wildl. Leaflet. 224. 6 pp.  
(Stresses that redwings eat many insect pests.)
- Cottam, C., and J. B. Trefethen. 1968. Whitewings. Van Nostrand Co., Inc., Princeton, N.J. 384 pp.  
(Great-tailed grackles ate eggs and young of other grackles, mockingbirds, and white-winged, mourning, and Mexican ground doves.)
- Cowan, I. M. 1942. Termite-eating by birds in British Columbia. Auk 59(3):451.  
(Brewer's blackbird was one of several species eating termites.)

- Crase, F. T., and R. W. DeHaven. 1973. Blackbird damage appraisal for rice in the Sacramento Valley, California—1972 studies. U.S. Fish Wildl. Serv., Denver Wildl. Res. Cent. unpub. rep. dated January 15, 1973. 21 pp. Mimeographed.  
(Annual foods of redwings, tricolors, Brewer's, yellowheads, and cowbirds were largely rice, wildmillet, and insects.)
- Crebbs, T. C., Jr. 1960. Blackbird ecology and their relationship to agriculture in southeastern Virginia. M.S. Thesis. Va. Polytech. Inst., Blacksburg. 101 pp.  
(Most common grackles shot in peanut fields had eaten peanuts. Some data on foods of redwings, starlings, and cowbirds also collected from peanut fields.)
- Criddle, N. 1920. Birds in relation to insect control. *Can. Field Nat.* 34(8):151-153.  
(Crows, gulls, black terns, grouse, and blackbirds ate large numbers of grasshoppers.)
- Cypert, E., and B. S. Webster. 1948. Yield and use by wildlife of acorns of water and willow oaks. *J. Wildl. Manage.* 12(3):227-231.  
(Common grackles were among several species that collectively took 2% of the acorn crop from plots on the White River National Wildlife Refuge, Arkansas.)
- Darden, T. 1974. Common grackles preying on fish. *Wilson Bull.* 86(1):85-86.
- Dater, E. E. 1961. Acorn crop collapses. *East. Bird Banding Assoc. News* 24(5):151.  
(Common grackles depend on pin-oak for a large portion of their winter food.)
- Davis, J. 1954. Seasonal changes in bill length of certain passerine birds. *Condor* 56(3):142-149.  
(Seasonal changes of bill length in redwings, tricolors, and Brewer's were correlated to the amount of insects consumed each season.)
- Davis, M. 1944. Purple grackle kills English sparrow. *Auk* 61(1):139-140.  
(The common grackle killed the sparrow and ate part of it.)
- Davis, W. B. 1933. The span of the nesting season of birds in Butte County, California, in relation to their food. *Condor* 35(4):151-154.  
(Demonstrates a positive correlation between time of nesting and general food habits. Redwings, tricolors, cowbirds, and Brewer's blackbirds were some of the bird species studied.)
- Davis, W. R., II, and K. A. Arnold. 1972. Food habits of the great-tailed grackle in Brazos County, Texas. *Condor* 74(4):439-446.  
(The food of 129 great-tailed grackles was 80% animal matter, largely orthopterans. Insects were eaten most during the warm season. Nestlings were fed insects and grit.)
- Davison, V. E. 1961. Food competition between game and non-game birds. *Trans. North Am. Wildl. Nat. Resour. Conf.* 26:239-245.  
(Fifteen species of non-game birds, including redwings, cowbirds, and common grackles, feed on crops and non-agricultural foods in the Southeast in winter; 46 foods are discussed.)
- Dawson, W. L. 1923. *Birds of California*. Vol. 1. S. Moulton Co., San Francisco. 671 pp.  
(Estimated that each redwing eats enough insects to be worth \$1 per year to the alfalfa crop.)
- De Grazio, J. W., J. F. Besser, T. J. DeCino, J. L. Guarino, and R. I. Starr. 1971. Use of 4-aminopyridine to protect ripening corn from blackbirds. *J. Wildl. Manage.* 35(3):565-569.  
(Redwings destroyed 3 bushels of field corn per acre in untreated South Dakota fields.)

- Dennis, J. V. 1949. Grackle competition for dogwood fruit. *Auk* 66(2):208.  
(In one-half hour, a flock of common grackles stripped the berries from 20 dogwood trees.)
- Denton, J. F. 1947. Redwings feeding on seeds of long-leafed pine. *Oriole* 12(1):10.
- Dyer, M. I. 1967. An analysis of blackbird flock feeding behavior. *Can. J. Zool.* 45(5):765-772.  
(Feeding behavior of redwings and factors affecting feeding patterns.)
- Emlen, J. T., Jr. 1937. Bird damage to almonds in California. *Condor* 39(5):192-197.  
(Redwings, tricolors, and Brewer's did not cause significant amounts of damage.)
- Ernst, S. G. 1944. Observation on the food of the bronzed grackle. *Auk* 61(4):644-645.  
(Common grackles ate leopard frogs in New York.)
- Fankhauser, D. 1962. Observations of birds feeding on overwintering corn borer. *Wilson Bull.* 74(2):191.  
(Redwings did not feed heavily on corn borers in cornstalks.)
- Fautin, R. W. 1941. Development of nestling yellow-headed blackbirds. *Auk* 58(2):215-232.  
(Food brought to nestlings was almost entirely insect.)
- Fischer, R. B. 1953. Winter feeding of the redwing (*Agelaius phoeniceus*). *Auk* 70(4):496-497.  
(Redwings ate moth larvae from ragweed stems.)
- Fleetwood, R. J. 1947. Redwings feeding on seeds of loblolly and slash pine. *Oriole* 12(3):39-40.
- Follett, W. I. 1957. Bronzed grackles feeding on emerald shiners. *Auk* 74(2):263.
- Forbes, S. A. 1907. On the life history, habits, and economic relations of the white-grubs and may-beetles. *Ill. Agric. Exp. Stn. Bull.* 116. pp. 447-480.  
(Crows and blackbirds are principal enemies of these insects.)
- Foster, F. B. 1927. Grackles killing young pheasants. *Auk* 44(1):106.  
(Common grackles killed and ate pheasant chicks.)
- Friedmann, H. 1929. The cowbirds. Charles C. Thomas, Pub., Baltimore, 421 pp.  
(Food of the brown-headed cowbird is discussed along with many other life history and behavioral aspects.)
- Gabrielson, I. N. 1914. Ten days' bird study in a Nebraska swamp. *Wilson Bull.* 26(2):51-68.  
(Food of nestling yellowheads and redwings.)
- Gabrielson, I. N. 1915. Notes on the red-winged blackbird. *Wilson Bull.* 27(2):293-302.  
(Food of nestling redwings in Iowa.)
- Gabrielson, I. N. 1922. Short notes on the life histories of various species of birds. *Wilson Bull.* 34(4):193-210  
(Food of nestling common grackles was largely earthworms.)
- Gilfillan, M. C. 1963. Modern control of bird damage. *Ohio Conserv. Bull.*, July:24-27  
(Mentions blackbird damage to grain.)

- Gillette, C. P. 1905a. The western cricket. Colo. Agric. Exp. Stn. Bull. 101. 16 pp.  
(Bears and coyotes feed upon this pest but birds destroy them in greatest numbers; hawks, sage grouse, and blackbirds noted.)
- Gillette, C.P. 1905b. The beet web-worm. Pages 3-12 in Beet worms and their remedies. Colo. Agric. Exp. Stn. Bull. 98.  
(Large flocks of blackbirds devoured these in large quantities.)
- Giltz, M. L., and T. M. Stockdale. 1960. The red-winged blackbird story. Ohio Agric. Exp. Stn. Spec. Circ. 95. 19 pp.  
(Annual redwing foods in Ohio were 69% vegetable and 31% animal.)
- Goddard, S. V. 1969. Fall and winter food habits of red-winged blackbirds and brown-headed cowbirds in western Oklahoma. Wilson Bull. 81(3):336-337.  
(Grain sorghum, ragweed seeds, and insects were the most frequently eaten items for both species.)
- Goss, N. S. 1891. History of the birds of Kansas. G. W. Grane & Co., Topeka. 692 pp.  
(An early natural history report; some comments on the foods of most blackbird species.)
- Gowanlock, J. N. 1914. The grackle as a nest-robber. Bird-Lore 16(3):187-188.  
(Common grackle predation on the eggs and young of house sparrows.)
- Graham, E. H. 1941. Legumes for erosion control and wildlife. U.S. Dep. Agric. Misc. Publ. 412. 153 pp.  
(Lists the legume species used as food by different birds, including most blackbird species.)
- Grinnell, J. 1932. Notes of some birds observed in the vicinity of Colusa, California. Condor 25(5):172-176.  
(Mentions the redwing's rice-eating habits.)
- Hamilton, W. J., Jr. 1951. The food of nestling bronzed grackles, *Quiscalus quiscula versicolor*, in central New York. Auk 68(2):213-217.  
(Lists the food items of 130 nestlings.)
- Hardy, J. W. 1961. Resident and migrant blackbirds in southeastern Virginia: Agricultural depredations and winter roost locations. M.S. Thesis. Va. Polytech. Inst., Blacksburg. 74 pp.  
(Blackbirds damaged corn, peanuts, and milo.)
- Hayne, D. W. 1946. The relation between number of ears opened and the amount of grain taken by redwings in corn fields. J. Agric. Res. 72(8):289-295.  
(Also feeding behavior in cornfields.)
- Helms, C. W. 1962. Red-winged blackbird killing sharp-tailed sparrow. Wilson Bull. 74(1):89-90.  
(Apparently tried to eat it.)
- Henderson, J. 1927. The practical value of birds. Macmillan Co., New York. 342 pp.  
(Summarizes and discusses many studies relating to the beneficial aspects of birds, including blackbirds.)
- Henshaw, H. W. 1907. Birds useful in the war against the cotton boll weevil. U.S. Dep. Agric. Circ. 57. 4 pp.  
(Blackbirds help the farmer by eating weevils.)

- Henshaw, H. W. 1908. Does it pay the farmer to protect birds? Pages 165-178 in Yearbook of Agriculture, 1907. U.S. Department of Agriculture, Washington, D.C.  
(Blackbirds eat insects as well as grain.)
- Hintz, J. V., and M. I. Dyer. 1970. Daily rhythm and seasonal change in the summer diet of adult red-winged blackbirds. J. Wildl. Manage. 34(4):789-799.  
(Caloric intake is higher in the morning than after noon, less in June than in September.)
- Hodges, J. 1951. Land birds feeding on crayfish. Auk 68(4):526-527.  
(Common grackle was observed eating a crayfish in Iowa.)
- Horn, H. S. 1968. The adaptive significance of colonial nesting in the Brewer's blackbird (*Euphagus cyanocephalus*). Ecology 49(4):682-694.  
(Colonial nesting adaptive to variable food supply.)
- Howard, W. E., M. W. Cummings, and A. Zajanc. 1961. Comments on bird problems in California. Calif. Vector News 8(3):13-17.  
(Mentions redwing depredations on rice.)
- Howard, W. J. 1937. Bird behavior as a result of emergence of seventeen year locusts. Wilson Bull. 49(1):43-44.  
(Common grackles and cowbirds fed on locusts.)
- Howell, A. B. 1922. Redwings of the Imperial Valley, California. Condor 24(2):60-61.  
(Discusses beneficial as well as harmful aspects of redwing food habits.)
- Howell, A. H. 1906. Birds that eat the cotton boll weevil, a report of progress. U.S. Dep. Agric. Biol. Surv. Bull. 25. 22 pp.  
(Blackbirds, especially Brewer's, eat weevils during the winter months when this is the most beneficial.)
- Howell, A. H. 1907. The relation of birds to the cotton boll weevil. U.S. Dep. Agric. Biol. Surv. Bull. 29. 31 pp.  
(Redwings, cowbirds, Brewer's, common grackles, and great- and boat-tailed grackles ate boll weevils.)
- Howell, A. H. 1908. Destruction of the cotton boll weevil by birds in winter. U.S. Dep. Agric. Circ. 64. 5 pp.  
(Redwings, Brewer's, and rusty blackbirds were important bird species eating boll weevils during the winter months.)
- Howell, A. H. 1911. Birds of Arkansas. U.S. Dep. Agric. Biol. Surv. Bull. 38. 100 pp.  
(Food of yellowheads, redwings, Brewer's, cowbirds, and rusty blackbirds in Arkansas.)
- Judd, S. D. 1899. Birds as weed destroyers. Pages 221-232 in Yearbook of Agriculture, 1898. U.S. Department of Agriculture, Washington, D.C.  
(Blackbirds eat weed seeds, as well as grain, and thereby benefit the farmer.)
- Judd, S. D. 1901. The food of nestling birds. Pages 411-436 in Yearbook of Agriculture, 1900. U.S. Department of Agriculture, Washington, D.C.  
(Economic benefit of insects brought to nestlings, including nestling blackbirds.)
- Judd, S. D. 1902. Birds of a Maryland farm. U.S. Dep. Agric. Biol. Surv. Bull. 17. 116 pp.  
(Foods of redwings, common grackles, cowbirds, and rusty blackbirds in Maryland.)

- Kalmbach, E. R. 1914. Birds in relation to the alfalfa weevil. U.S. Dep. Agric. Bull. 107. 64 pp. (Redwings, cowbirds, yellowheads, and Brewer's blackbirds ate large numbers of this weevil in an infested area in Utah during spring.)
- Kalmbach, E. R. 1937. Blackbirds and the rice crop on the gulf coast. U.S. Dep. Agric. Wildl. Res. Manage. Leafl. BS-96. 4 pp. (Rice depredations in Louisiana.)
- Kalmbach, E. R. 1942. Blackbirds and grain crops in the eastern United States. U.S. Fish Wildl. Serv. Wildl. Leafl. 220. 5 pp. (Discusses grain depredations by blackbirds.)
- Kalmbach, E. R. 1952. Birds, beasts, and bugs. Pages 724-731 in *Yearbook of Agriculture, 1952*. U.S. Department of Agriculture, Washington, D.C. (Beneficial aspects of insect consumption by blackbirds.)
- Keeler, J. E. 1969. Blackbird studies. Alabama Department of Conservation, Division of Fish and Game, Montgomery, 59 pp. (Winter foods of the cowbird, common grackle, redwing, and starling in Alabama.)
- Kennard, F. H. 1920. Notes on the breeding habits of the rusty blackbird in northern New England. *Auk* 37(3):412-422. (Males help to feed young.)
- Kennedy, C. H. 1950. The relation of American dragonfly-eating birds to their prey. *Ecol. Monogr.* 20(2):103-142. (Redwings are included with other passerines as important predators of dragonflies.)
- Knappen, P. 1933. Some bird enemies of Odonota. *Auk* 50(4):452. (Redwings were among several bird species observed feeding on this insect order.)
- Knowlton, G. F. 1944. Redwings eat pea aphids. *Auk* 61(1):138.
- Knowlton, G. F. 1947. Some insect food of the yellow-headed blackbird. *Auk* 64(3):459.
- Knowlton, G. F., and F. C. Harmston. 1943. Grasshoppers and crickets eaten by Utah birds. *Auk* 60(4):589-591. (Includes yellowheads, redwings, and Brewer's.)
- Knowlton, G. F., and P. E. Telford. 1946. Insects eaten by Brewer's blackbirds. *Auk* 63(4):589.
- Krapu, G. L. 1973. Red-winged blackbirds nesting near Great Slave Lake, N.W.T. *Blue Jay* 31(3):147-149. (Redwings did not nest in borrow-pit ponds, perhaps because of low food availability.)
- Lack, D. 1968. Ecological adaptations for breeding in birds. Methuen and Co., Ltd., London. 409 pp. (Extensive discussion of Icteridae, including foods and associated adaptations.)
- Lamb, C. C. 1944. Grackle kills warbler. *Condor* 46(5):245. (Great-tailed grackle killed a yellow warbler during an apparent nest-predation attempt.)

- Lange, W. H., and M. D. Miller, eds. 1970. Insect and other animal pests of rice. Calif. Agric. Exp. Stn. Ext. Serv. Circ. 555. 32 pp.  
(Briefly mentions blackbird depredations.)
- Laporte, P. 1974. Common grackle kills a barn swallow. *Wilson Bull.* 86(4):477-478.  
(Apparently to eat.)
- LaRivers, I. 1941. The Mormon cricket as food for birds. *Condor* 43(1):65-69.  
(Redwings, cowbirds, yellowheads, and especially Brewer's feed on this pest.)
- Lefebvre, P. W. 1961. Blackbirds in southeastern Virginia: Nesting productivity, depredations, and damage control methods. M.S. Thesis. Va. Polytech. Inst., Blacksburg. 73 pp.  
(Food of redwings, starlings, common grackles, and cowbirds in relation to crop damage.)
- Linford, J. H. 1938. Notes on food habits of the thick-billed red-winged blackbirds in Utah. *Proc. Utah Acad. Sci.* 15:91-92.  
(Amount of a given food eaten was correlated to its abundance in the habitat.)
- Linsdale, J. M. 1938. Environmental responses of vertebrates in the Great Basin. *Am. Midl. Nat.* 19(1):1-206.  
(Limited observations on the food of breeding redwings in central Nevada.)
- Macklin, P. R. 1958. Spittle insects as food of the red-winged blackbird. *Auk* 75(2):225.
- Mailliard, J. 1914. Notes on a colony of tri-colored redwings. *Condor* 16(5):204-207.  
(Reported milk barley as being "much prized as food for the young." Stomach contents of adults were largely grasshoppers.)
- Martin, A. C., H. S. Zim, and A. L. Nelson. 1951. *American wildlife and plants*. McGraw-Hill Book Co., New York. 500 pp.  
(Contains information on the major plant foods of all North American blackbirds. Summarizes food habits of 2,406 redwings, 908 Brewer's, 228 yellowheads, 591 cowbirds, 132 rusty blackbirds, 417 great- and boat-tailed grackles, 2,314 common grackles, and many other bird species.)
- Maxwell, G. R., II, and L. S. Putnam. 1972. Incubation, care of young, and nest success of the common grackle (*Quiscalus quiscula*) in northern Ohio. *Auk* 89(2):349-359.  
(Records the numbers of feeding visits to nests by males and females.)
- McAtee, W. L. 1913. Index to papers relating to the food of birds. U.S. Dep. Agric. Biol. Surv. Bull. 43. 69 pp.  
(Annotated bibliography of Department of Agriculture publications from 1885 through 1911 dealing with the food of birds. Most blackbird species are covered.)
- McAtee, W. L. 1922. Local suppression of agricultural pests by birds. Pages 411-438 *in* Annual Report of the Smithsonian Institute for 1920.  
(Most blackbird species are mentioned as predators of insect pests.)
- McAtee, W. L. 1926. Birds feeding on the European corn borer. *Auk* 43(3):395.  
(Redwings and downy woodpeckers fed on the larvae.)



- McAtee, W. L. 1931. Usefulness of birds on the farm. U.S. Dep. Agric. Farmers' Bull. 1682. 14 pp.  
(Birds as predators of insect pests. One Brewer's blackbird ate 442 alfalfa weevils.)
- McAtee, W. L. 1946. The economic status of flocking birds. Condor 48(1):29-31.  
(Brewer's blackbirds wiped out infestations of canker-worms in California. Birds, including blackbirds, destroy 90% of the white grubs exposed by plowing.)
- McIlhenny, E. A. 1937. Life history of the boat-tailed grackle in Louisiana. Auk 54(3):274-295.  
(Food habits of both adult and nestling boat-tailed grackles.)
- Meanley, B. 1960. Fall food of the sora rail in the Arkansas rice fields. J. Wildl. Manage. 24(3):339.  
(The feeding activity of redwings, along with wind action, shatter some rice seeds, increasing their availability to soras.)
- Meanley, B. 1961. Late-summer food of red-winged blackbirds in a fresh tidal-river marsh. Wilson Bull. 73(1):36-40.
- Meanley, B. 1962. Feeding behavior of the red-winged blackbird in the Dismal Swamp region of Virginia. Wilson Bull. 74(1):91-93.  
(Peanut depredations by redwings; other foods are also mentioned.)
- Meanley, B. 1965. The roosting behavior of the red-winged blackbird in the southern United States. Wilson Bull. 77(3):217-228.  
(The general locality in which large roosts are located is probably influenced by food supply. Also, the difference in the species composition among roosts is probably related to the differences in their food habits.)
- Meanley, B. 1966. Red-winged blackbirds searching beneath pine bark for insects in winter. Auk 83(3):480-481.
- Meanley, B. 1971. Blackbirds and the southern rice crop. U.S. Fish Wildl. Serv. Resour. Publ. 100. 64 pp.  
(Details the annual foods of the redwing, cowbird, common grackle, and boat-tailed grackle in the Arkansas ricelands. Also includes less complete data for the Brewer's blackbird, rusty blackbird, bobolink, and starling.)
- Meanley, B., and R. T. Mitchell. 1966. Selected bibliography on the red-winged blackbird. U.S. Fish Wildl. Serv. Spec. Sci. Rep. Wildl. 97. 12 pp.  
(Contains several references on the food habits of redwings.)
- \*Mehner, J. F. 1950. An ecological study of the eastern red-winged blackbird (*Agelaius phoeniceus phoeniceus*) at Pymatuning. M.S. Thesis. Univ. Pittsburgh, Pittsburgh, Pa. 89 pp.  
(Cited by Meanley and Mitchell 1966.)
- Merrill, D. E. 1916. Grasshopper control. N. M. Agric. Exp. Stn. Bull. 102. 32 pp.  
(Quail, meadowlarks, and blackbirds are the main bird predators on this insect.)
- \*Merriam, C. H. 1885. Circular on economic ornithology. U.S. Dep. Agric. Biol. Surv. Bull. 20. 2 pp.  
(Cited by McAtee 1913.)

- \*Merriam, C. H. 1886. Circular on the food habits of birds. U.S. Dep. Agric. Circ. 1. 3 pp.  
(Cited by McAtee 1913.)
- Miller, R. S. 1968. Conditions of competition between redwings and yellow-headed blackbirds. *J. Anim. Ecol.* 37(1):43-62.  
(Relates time of nesting to hatches of insects used as food.)
- Milne, L. J. 1928. Further note on the bronzed grackle as a fisherman. *Can. Field Nat.* 42(7):177.  
(Ate freshwater amphipods.)
- Mitchell, R. T., and J. T. Linehan. 1967. Protecting corn from blackbirds. U.S. Fish Wildl. Serv. Wildl. Leaflet 476. 8 pp.
- Mott, D. F., and C. P. Stone. 1973. Predation on corn earworms by red-winged blackbirds. *Murrelet* 54(1):8-10.  
(Measures the effect of redwing predation on corn earworms.)
- Mott, D. F., J. W. De Grazio, and M. W. Fall. 1971. Investigation of blackbird damage to peanuts in central Oklahoma (Food habits supplement). U.S. Fish Wildl. Serv., Denver Wildl. Res. Cent. unpubl. rep. dated January 27, 1971. 4 pp. Mimeographed.  
(Bird species examined were redwings, rusty blackbirds, common and great-tailed grackles, and cowbirds.)
- Mott, D. F., R. R. West, J. W. De Grazio, and J. L. Guarino. 1972. Foods of the red-winged blackbird in Brown County, South Dakota. *J. Wildl. Manage.* 36(3):983-987.  
(Spring, summer, and early fall foods of the redwing.)
- Munro, J. A. 1929. Blackbirds feeding on the forest tent caterpillar. *Condor* 31(2):80.  
(Redwings and Brewer's.)
- Neff, J. A. 1937. Procedure and methods in controlling birds injurious to crops in California. Part II: Control methods. U.S. Bureau of Biological Survey. 153 pp.  
(Reviews the food habits of redwings, tricolors, and Brewer's.)
- Neff, J. A. 1949. Blackbird depredations on Arkansas rice fields. *Trans. North Am. Wildl. Conf.* 14:556-566.  
(Redwing, cowbird, common grackle, and rusty blackbird.)
- Neff, J. A., and B. Meanley. 1957a. Blackbirds and the Arkansas rice crop. *Ark. Agric. Exp. Stn. Bull.* 584. 89 pp.  
(Reports on field observations of feeding blackbirds and the laboratory examination of 2,208 stomachs. Major species studied were redwings, common grackles, and cowbirds.)
- Neff, J. A., and B. Meanley. 1957b. Status of Brewer's blackbird on the Grand Prairie of eastern Arkansas. *Wilson Bull.* 69(1):102-105.  
(The food of 59 adults.)
- Neff, J. A., and C. C. Wilson. 1940. The influence of birds on local grasshopper outbreaks in California. *Trans. North Am. Wildl. Conf.* 5:189-195.  
(Brewer's, redwings, and tricolors ate grasshoppers; birds are of value in reducing grasshopper populations.)
- Nero, R. W. 1950. Redwings feeding on white ash. *Wilson Bull.* 62(1):39-40.  
(Were observed eating the seeds.)

- Olsen, A. L. 1943. Cowbird carrying away and eating a bird's egg in the evening. *Wilson Bull.* 55(3):195.
- Orians, G. H. 1961. The ecology of blackbird (*Agelaius*) social systems. *Ecol. Monogr.* 31(3):285-312.  
(Discusses the food of breeding redwings and tricolors in California.)
- Orians, G. H. 1966. Food of nestling yellow-headed blackbirds, Cariboo Parklands, British Columbia. *Condor* 68(4):321-337.  
(Food brought to nestlings was 100% animal matter.)
- Orians, G. H., and H. S. Horn. 1969. Overlap in foods of four species of blackbirds in the potholes of central Washington. *Ecology* 50(5):930-938.  
(No differential specialization in food gathering was observable for redwings, yellowheads, Brewer's, and meadowlarks, and a large overlap in nestling food was apparent.)
- Palmer, T.S. 1900a. A review of economic ornithology in the United States. Pages 259-292 in *Yearbook of Agriculture, 1899*. U.S. Department of Agriculture, Washington, D.C.  
(A review of damage to agricultural crops caused by blackbirds and other bird species.)
- Palmer, T. S. 1900b. Legislation for the protection of birds other than game birds. U.S. Dep. Agric. Biol. Surv. Bull. 12. 94 pp.  
(Brief discussion of benefit and harm caused by blackbirds.)
- Payne, R. B. 1969. Breeding seasons and reproductive physiology of tri-colored blackbirds and red-winged blackbirds. *Univ. Calif. Publ. Zool.* 90:1-137.  
(Relates the timing of nesting of tricolors to the emergence of grasshoppers. Food of nestling tricolors was almost 100% animal matter.)
- Pellet, F. C. 1926. The fishing habit of the bronzed grackle. *Wilson Bull.* 38(4):235.  
(Common grackles fed extensively on minnows.)
- Pessino, C. M. 1968. Red-winged blackbird destroys eggs of common and roseate terns. *Auk* 85(3):513.  
(Apparently ate some of the contents.)
- Phillips, W. J., and G. W. Barber. 1931. The corn earworm as an enemy of field corn in the eastern states. U.S. Dep. Agric. Farmers' Bull. 1651. 17 pp.  
(Essentially a second printing of Phillips and King 1923.)
- Phillips, W. J., and K. M. King. 1923. The corn earworm: Its ravages on field corn and suggestions for control. U.S. Dep. Agric. Farmers' Bull. 1310. 17 pp.  
(Most important predators of the corn earworm were Brewer's, California redwings, great- and boat-tailed grackles, and downy woodpeckers.)
- Poor, H. H. 1946. Predation by grackles. *Proc. Linn. Soc. N. Y.* 54-57:54-55.  
(Common grackles killed and ate English sparrows.)
- Powell, C. M. 1960. Rice culture in Chicot County as pertaining to blackbirds. *Trans. North Am. Wildl. Nat. Resour. Conf.* 25:109-111.  
(Arkansas farmers estimated rice damage by blackbirds at 10% of the crop.)

- Power, D. M. 1970. Geographic variation of red-winged blackbirds in central North America. *Univ. Kans. Mus. Nat. Hist. Publ.* 19(1):1-83.  
(Discusses relationship of bill structure to feeding habits.)
- Prevett, J. P. 1972. Grackles retrieve dead smelt from Lake Erie. *Can. Field Nat.* 86(2):163-164.  
(Common grackles and redwings fed on the smelt.)
- Reese, J. G. 1973. Red-winged blackbird feeding on horseshoe crab eggs. *Wilson Bull.* 85(4):483.
- Richardson, F. 1947. Water-surface feeding of blackbirds. *Condor* 49(5):212.  
(Redwings and Brewer's waded on submerged water plants to capture newly emerging damselflies.)
- Roberts, T. S. 1909. A study of a breeding colony of yellow-headed blackbirds; including an account of the destruction of the entire progeny of the colony by some unknown natural agency. *Auk* 26(4):371-389.  
(Food brought to nestling yellowheads.)
- Robertson, R. J. 1973. Optimal niche space of the red-winged blackbird. III. Growth rate and food of nestlings in marsh and upland habitat. *Wilson Bull.* 85(2):209-222.  
(Fledgling success was similar in both habitats. Nestling starvation increases as the season progresses.)
- Roth, V. D. 1971. Unusual predatory activities of Mexican jays and brown-headed cowbirds under conditions of deep snow in southeastern Arizona. *Condor* 73(1):113.  
(Cowbirds attacked a junco.)
- Sanderson, E. D. 1906. Report on miscellaneous cotton insects in Texas. U.S. Dep. Agric. Bur. Entomol. Bull. 57. 63 pp.  
(The section on the differential locust mentions that large flocks of blackbirds fed extensively on this insect.)
- Schoener, T. W. 1968. Sizes of feeding territories among birds. *Ecology* 49(1):123-141.  
(Most icterids did not maintain feeding territories.)
- Schorger, A. W. 1941. The bronzed grackle's method of opening acorns. *Wilson Bull.* 53(4):238-240.
- Selander, R. K., and D. R. Giller. 1961. Analysis of sympatry of great-tailed and boat-tailed grackles. *Condor* 63(1):29-86.  
(Summarizes known foods and feeding behavior of both species.)
- Sloan, N. F., and H. C. Coppel. 1968. Ecological implications of bird predators on the larch casebearer in Wisconsin. *J. Econ. Entomol.* 61(4):1067-1070.  
(Studies showed that birds, including redwings, were significant predators of the larch casebearer.)
- Snelling, J. C. 1968. Overlap in feeding habits of red-winged blackbirds and common grackles nesting in a cattail marsh. *Auk* 85(4):560-585.  
(Although the insects taken by each species were generally the same, competition for food was not apparent.)
- Snyder, L. L. 1928. On the bronzed grackle. *Can. Field Nat.* 42(2):44,  
(Common grackle ate minnows from a bird bath.)

- Soriano, P. S. 1931. Food habits and economic status of the Brewer and red-winged blackbirds. *Calif. Fish Game* 17(4):361-395.  
(Extensive study of the foods of these species before 1916 in California.)
- Sprunt, A., Jr. 1941. Predation of boat-tailed grackles on feeding glossy ibises. *Auk* 58(4):587-588.  
(Boat-tailed grackles stole crayfish from the ibises.)
- Stickley, A. R., Jr., and J. L. Guarino. 1972. A repellent for protecting corn seed from blackbirds and crows. *J. Wildl. Manage.* 36(1):150-152.  
(Sprout damage by redwings and common grackles was reduced after dusting the seed with methiocarb.)
- Stockdale, T. M. 1959. Food habits and related activities of the red-winged blackbird in north-central Ohio. M.S. Thesis. Ohio State Univ., Columbus. 41 pp.  
(Study of redwing foods in Lake Erie marshland.)
- Stone, C. P., Jr. 1973. Phenetic variation of breeding red-winged blackbirds in Ohio. Ph.D. Thesis. Ohio State Univ., Columbus. 276 pp.  
(Food of adult redwings during the breeding season. Differences among sexes, upland versus marsh breeding birds, seasonal and daily time periods are treated statistically. Sex and ecotype differences are discussed in relation to morphological differences.)
- Sullivan, R. H. 1912. The economic value of bird life. *Kans. State Agric. Coll. Agric. Educ.* 3(7):1-47.  
(Estimated that there were 15 million redwings in Kansas and in 21 days their young could consume 9,400,000 pounds of insects or they might destroy 6,300,000,000 cutworms.)
- Taverner, P. A. 1928. On the bronzed grackle. *Can. Field Nat.* 42(2):44-45.  
(Common grackles ate goldfish from a garden pool.)
- Taylor, K. 1958. Common grackle kills and eats house sparrow. *Auk* 75(2):222-223.
- Thurston, R., and O. Prachuabmoh. 1971. Predation by birds on tobacco hornworm larvae infecting tobacco. *J. Econ. Entomol.* 64(6):1548-1549.  
(Common grackle.)
- Tryon, H. H. 1938. Redwings feeding on larch saw-fly. *Auk* 55(1):125.
- Tutor, B. M. 1962. Nesting studies of the boat-tailed grackle. *Auk* 79(1):77-84.  
(Makes note of egg predation by great-tailed grackles.)
- Tyler, J. G. 1907. A colony of tri-colored blackbirds. *Condor* 9(6):177-178.  
(Food and feeding behavior at a tricolor breeding colony.)
- Van Dersal, W. R. 1940. Utilization of oaks by birds and mammals. *J. Wildl. Manage.* 4(4):404-428.  
(Table 2, a summary of oak use by birds, includes four listings for the common and boat-tailed grackles.)
- Verbeek, N.A.M. 1964. A time and energy budget study of the Brewer blackbird. *Condor* 66(1):70-74.  
(Feeding behavior and locations.)

- Voigts, D. K. 1973. Food niche overlap of two Iowa marsh icterids. *Condor* 75(4):392-399.  
(Items fed to nestling redwings and yellowheads.)
- Warren, B. H. 1890. Report on the birds of Pennsylvania. Pennsylvania State Board of Agriculture, Harrisburg. 434 pp.  
(Food of all Pennsylvania blackbird species.)
- Wayne, A. T. 1899. Destruction of birds by the great cold wave of February 13 and 14, 1899. *Auk* 16(2):197-198.  
(Redwings ate fox sparrows killed by the cold.)
- Weber, J. A. 1912. A case of cannibalism among blackbirds. *Auk* 29(3):394-395.  
(Common grackle predation on redwing nestlings.)
- West, R. R. 1967. Some food items of the boat-tailed grackle in late June. U.S. Fish Wildl. Serv., Denver Wildl. Res. Cent. unpubl. rep. dated September 15, 1967. 2 pp. Mimeographed.  
(Differences in esophageal and stomach contents of great-tailed grackles.)
- West, R. R. 1969. Repelling boat-tailed grackles from sprouting corn with a carbamate compound. *Tex. J. Sci.* 21(2):231-233.  
(Great-tailed grackle damage to corn sprouts was reduced with a methiocarb seed treatment.)
- West, R. R. 1970. Food items found in birds collected in southeastern Oklahoma, fall 1969. U.S. Fish Wildl. Serv., Denver Wildl. Res. Cent. unpubl. rep. dated May 1970. 6 pp. Mimeographed.  
(Redwing, common grackle, and cowbird.)
- Wiens, J. A. 1965. Behavioral interactions of red-winged blackbirds and common grackles on a common breeding ground. *Auk* 82(3):356-374.  
(The grackles did not prey on redwing eggs or young.)
- Williams, L. 1952. Breeding behavior of the Brewer blackbird. *Condor* 54(1):3-47.  
(Feeding behavior related to breeding.)
- Willson, M. F. 1966. Breeding ecology of the yellow-headed blackbird. *Ecol. Monogr.* 36(1):51-77.  
(Foods of nestling yellowheads. Also discusses possible sources of bias from the choke collar technique.)
- Willson, M. F., and G. H. Orians. 1963. Comparative ecology of red-winged and yellow-headed blackbirds during the breeding season. *Proc. 16th Int. Congr. Zool.* 3:342-346.
- Willson, M. F., R. D. St. John, R. J. Lederer, and S. J. Muzos. 1971. Clutch size in grackles. *Bird-Banding* 42(1):28-35.  
(Food of nestling common grackles and unexpected problems with pipe cleaner choke collars.)
- Wilson, A. 1831. American ornithology. Vol. 4. Bradshaw and Inskeep, Philadelphia. 362 pp.  
(Another early work mentioning the food of blackbirds; see pp. 30-39.)
- Wood, H. B. 1938. Nesting of red-winged blackbirds. *Wilson Bull.* 59(2):143-144.  
(One nestling stomach contained flies and other insects.)

Worth, C. B. 1970. Aspiration of seeds by trapped red-winged blackbirds. *Bird-Banding* 41(3):243-244. Seed aspiration caused death in several trapped redwings.)

\*Wright, C. W. 1954. Extent of damage to corn by blackbirds in southern New Jersey in 1953. New Jersey Game and Fish Commission. 4 pp. Mimeographed.  
(Cited by Meanley and Mitchell 1966.)

## RELATED REFERENCES

Alcock, J. 1973. Cues used in searching for food by red-winged blackbirds (*Agelaius phoeniceus*). *Behaviour* 46(1-2):174-188.  
(Experiments concerning the role of visual cues and learned behavior in searching for food.)

Anonymous. 1935. Directions for preservation and care of material collected for food habits studies. U.S. Dep. Agric. Wildl. Res. Manage. Leaflet BS-29. 4 pp.

Anonymous. 1942. Laboratory procedure in wildlife food studies. U.S. Fish Wildl. Serv. Wildl. Leaflet 222. 11 pp.  
(Complete guide to the laboratory portion of food habits studies.)

Bartonek, J. C., and J. J. Hickey. 1969. Food habits of canvasbacks, redheads, and lesser scaup in Manitoba. *Condor* 71(3):280-290.  
(The food contents of the esophagus, proventriculus, and gizzard were different within each species of duck. Should also apply to blackbirds.)

Beer, J., and W. Tidyman. 1942. The substitution of hard seeds for grit. *J. Wildl. Manage.* 6(1):70-82.  
(Showed that hard seeds are sometimes used as a substitute for grit in six species of gallinaceous birds.)

Brenner, F. J. 1966. The influence of drought on reproduction in a breeding population of red-winged blackbirds. *Am. Midl. Nat.* 76(1):201-210.  
(Standing crop of insects and number of breeding female redwings decreased during two drought years.)

Cahn, A. R. 1914. The determination of the food of nestling birds. *Wilson Bull.* 26(4):189-193.  
(Discusses the relative merits of field observations and stomach examinations.)

Cottam, C. 1935. Economic ornithology and the correlation of laboratory and field methods. U.S. Dep. Agric. Wildl. Res. Manage. Leaflet BS-30. 13 pp.

De Grazio, J. W., J. F. Besser, J. L. Guarino, C. M. Loveless, and J. L. Oldemeyer. 1969. A method for appraising blackbird damage to corn. *J. Wildl. Manage.* 33(4):988-994.  
(A method for estimating the volume of corn lost to redwings by measuring the length of damaged rows on sample ears.)

Dillery, D. G. 1965. Post-mortem digestion of stomach contents in the savannah sparrow. *Auk* 82(2):281.  
(Digestion continues after death and could result in the digestion of soft-bodied insects and worms before examination.)

- Gullion, G. W. 1966. A viewpoint concerning the significance of studies of game bird food habits. *Condor* 68(4):372-376.  
(Discusses bias associated with the use of hunter-killed fall birds only, relatively short-term studies, and the lack of related population and ecological data.)
- Hanson, W. R., and F. Graybill. 1956. Sample size in food-habits analysis. *J. Wildl. Manage.* 20(1):64-68  
(Method of computing the sample size needed so the data will be statistically significant.)
- Hartley, P.H.T. 1948. The assessment of the food of birds. *Ibis* 90(3):361-381.  
(In-depth discussion of the various methods used to investigate the foods of birds.)
- Jensen, G. H., and L. J. Korschgen. 1947. Contents of crops, gizzards, and droppings of bobwhite quail force-fed known kinds and quantities of seeds. *J. Wildl. Manage.* 11(1):37-43.  
(Methodology for determining digestive rates of various kinds of seeds.)
- Kalmbach, E. R. 1934. Field observation in economic ornithology. *Wilson Bull.* 46(2):73-90.  
(Discusses various problems incurred in food habits work; includes the economic status of redwings.)
- Kalmbach, E. R. 1943. Birds, rodents, and colored lethal baits. *Trans. North Am. Wildl. Conf.* 8:408-416.  
(Many species of birds were repelled from grains dyed bright colors. Certain colors in themselves apparently disturb birds.)
- Kalmbach, E. R., and I. N. Gabrielson. 1921. Economic value of the starling in the United States. *U.S. Dep. Agric. Bull.* 868. 66 pp.  
(Economic considerations of an introduced species.)
- Kendeigh, S. C. 1934. The role of the environment in the life of birds. *Ecol. Monogr.* 4(3):299-417.  
(Excellent ecology-oriented study on how house wrens have adjusted to meet the rigors of their environment.)
- Korschgen, L. J. 1969. Procedures for food-habits analyses. Pages 233-250 in R. H. Giles, ed., *Wildlife management techniques*. 3rd ed. Wildlife Society, Washington, D.C.  
(Includes procedures for avian food-habits analysis.)
- Lack, D. 1954. *The natural regulation of animal numbers*. Oxford University Press, London. 343 pp.  
(Chapter 12 has an excellent discussion of food theory and Chapter 13 discusses food as a population-limiting factor.)
- Lamprey, H. F. 1967. Notes on the dispersal and germination of some tree seeds through the agency of mammals and birds. *East Afr. Wildl. J.* 5:179-180.  
(Seeds were germinated from fecal pellets.)
- Linehan, J. T. 1967. Measuring bird damage to corn. *Proc. Vertebr. Pest Conf.* 3:50-56.  
(Discusses three methods of estimating damage and the factors that determine which would be the best method to use.)



- McAtee, W. L. 1912. Methods of estimating the contents of bird stomachs. *Auk* 29(4):449-464. (A defense of the percentage composition method of determining the food habits of a species.)
- McAtee, W. L. 1947. Distribution of seeds by birds. *Am. Midl. Nat.* 38(1):214-223. (Cites almost 100 American references pertaining to the dispersal of seeds by birds.)
- Medin, D. E. 1970. Stomach content analyses: Collections from wild herbivores and birds. Pages 133-145 in *Range and habitat evaluation—A research symposium*. U.S. Dep. Agric. Publ. 1147. (An excellent review of various methods used in past food habits studies. Also outlines future research needs.)
- Morris, R. F., W. F. Cheshire, C. A. Miller, and D. G. Mott. 1958. The numerical response of avian and mammalian predators during a gradation of the spruce budworm. *Ecology* 39(3):487-494. (Bird predators were of little control value during a budworm outbreak.)
- Morse, D. H. 1970. Ecological aspects of some mixed-species foraging flocks of birds. *Ecol. Monogr.* 40(1):119-168. (Studied mixed-species foraging flocks of parids and concluded that the flocks have several functions that vary for the individuals and species in the flocks.)
- Nestler, R. B. 1939. Feeding requirements of gallinaceous upland game birds. Pages 893-924 in *Yearbook of Agriculture, 1939*. U.S. Department of Agriculture, Washington, D.C. (Discusses the need of gallinaceous birds for various vitamins, minerals, etc.)
- Orians, G. 1971. Ecological aspects of behavior. Pages 513-546 in D. S. Farner and J. R. King, eds., *Avian biology*. Vol. 1. Academic Press, New York. (Discusses the foraging behavior of birds in regard to discrimination of prey, discrimination of foraging habitat, and the basis of broad foraging patterns.)
- Owen, D. F. 1956. The food of nestling jays and magpies. *Bird Study* 3(4):257-265. (Discusses the choke collar technique for collecting nestling food.)
- Proctor, V. W. 1968. Long-distance dispersal of seeds by retention in digestive tracts of birds. *Science* 160(3825):321-322. (Seeds regurgitated by birds were viable.)
- Seibert, H. C. 1949. Differences between migrant and non-migrant birds in food and water intake at various temperatures and photoperiods. *Auk* 66(2):128-153. (Did not study blackbirds but results may be pertinent.)
- Shields, P. W., and D. A. Duncan. 1966. Fall and winter food of California quail in dry years. *Calif. Fish Game* 52(4):275-282. (Discusses important differences, related to habitat changes, found in the foods of this species in studies conducted during 1960-63 and a study conducted in 1937.)
- Stevenson, J. 1933. Experiments on the digestion of food by birds. *Wilson Bull.* 45(4):155-167. (Early discussion of the digestive rate of foods in the intestine.)
- Sturkie, P. D. 1965. *Avian physiology*. 2nd ed. Cornell University Press, Ithaca, N.Y. 766 pp. (Excellent reference on the general physiology of birds.)

- Swank, W. G. 1944. Germination of seeds after ingestion by ring-necked pheasants. *J. Wildl. Manage.* 8(3):223-231.  
(Seeds germinated after passing through the intestinal tract of pheasants. Hard seeds germinated more frequently than soft.)
- Swanson, G. A., and J. C. Bartonek. 1970. Bias associated with food analysis in gizzards of blue-winged teal. *J. Wildl. Manage.* 34(4):739-746.  
(Significant disagreement in the composition of esophageal and gizzard contents from North Dakota teal.)
- Udvardy, M.D.F. 1969. *Dynamic zoogeography with special reference to land animals.* Van Nostrand Reinhold Co., New York. 445 pp.  
(Contains an informative discussion of "endozoic biochore dispersal," or dispersal of seeds by passage through the intestine.)
- Verner, J., and M. F. Willson. 1966. The influence of habitats on mating systems of North American passerine birds. *Ecology* 47(1):143-147.  
(Relationship of quality and quantity of food to mating systems. Most blackbird species were included in the analysis.)
- Wetmore, A. 1919. Notes on the structure of the palate in the Icteridae. *Auk* 36(2):190-197.  
(Use of the "palatal keel" in feeding by common grackles.)



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