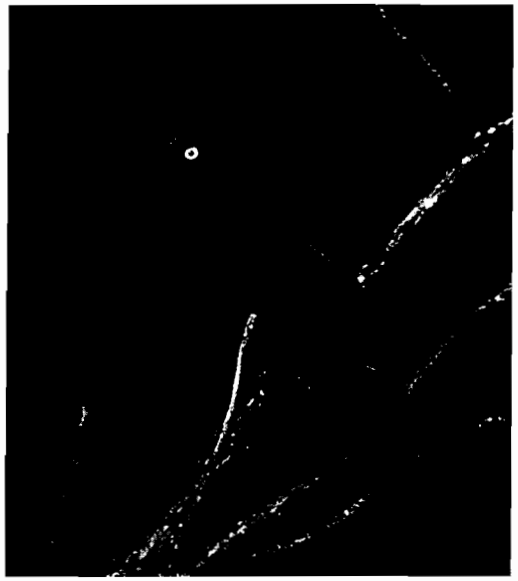
REP 1996-003
REP 1995-074

MICHAEL L. AVERY

Euphagus carolinus

FRENCH: *Quiscale rouilleux*

Rusty Blackbird



The Rusty Blackbird, perhaps the least well known of North America's blackbirds, breeds north to the tree line in wet forests of Alaska, Canada, and the northeastern United States. No other North American blackbird breeds as far north. Although detailed studies of its breeding biology are few, this species nests most frequently along bogs, muskeg swamps, beaver (*Castor canadensis*) ponds, and streams, and its robust, arboreal nests are often reused by other species such as the Solitary Sandpiper (*Tringa solitaria*).

This species is not distinctively marked except for brown, rust-colored edgings on its upperbody feathers in fall and winter. An opportunistic feeder, it eats mostly invertebrates during the breeding season, generally taking them by probing in mud and vegetation along the edges of wetlands. In winter and on migration, it joins mixed-species roosts and feeding flocks, but also occurs apart from other species, favoring woodlands more than other blackbirds do. Also unlike other blackbirds, this species is seldom a nuisance depredating crops or at roosts.

Because of its remote breeding habitat, inconspicuous behavior, and lack of economic impact, this species has received little study, and its population status and trends remain poorly known.

The Birds of North America

Life Histories for the 21st Century

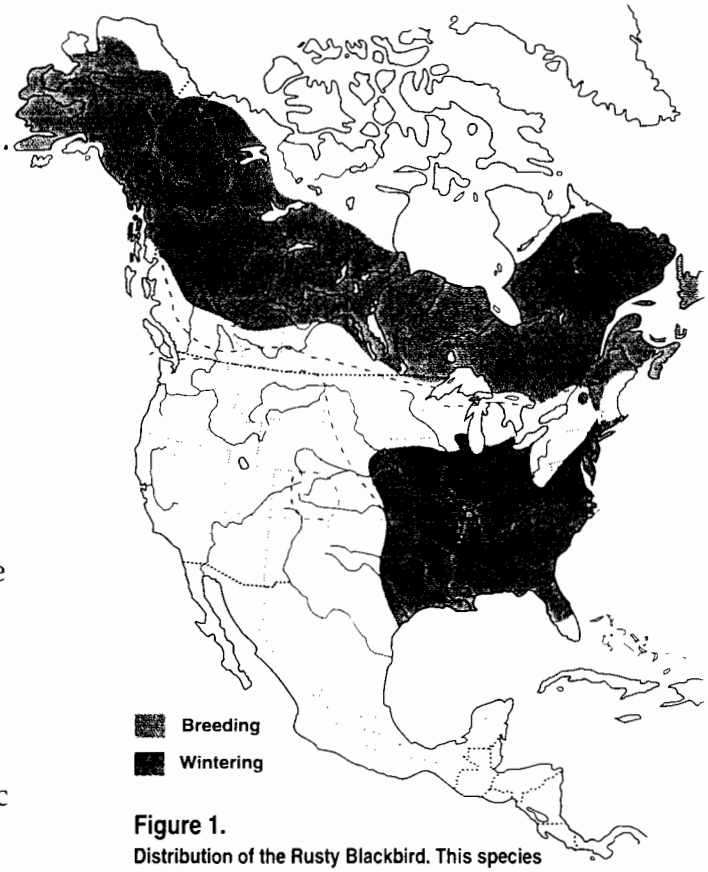


Figure 1.
Distribution of the Rusty Blackbird. This species winters locally and irregularly between dotted lines, and to the southern tip of Florida.

DISTINGUISHING CHARACTERISTICS

Overall length 21–25 cm. During breeding season, adult male uniformly black above with a blue-green to greenish gloss, adult female slate gray, darker above with a bluish green gloss. In fresh Basic (fall and winter) plumage, males are characterized by rust-edged tertials and rusty brown feathering on crown, nape, and back with lighter brown to buff over the eye and on cheeks, throat, breast, and sides on otherwise black feathering; in females, tertials are edged rusty brown, as are crown, nape, and back, whereas cheek, chin, throat, breast, and sides have lighter buff-brown edgings. Fall females have conspicuous pale buff line above the eye. Immature birds resemble adults except that the rusty and light brown emarginations are wider, giving a browner appearance overall. Immatures have brown irides until fall; then irides become pale yellow and remain yellow throughout year. In all birds, narrow bill is shorter than the head. Wings appear long, narrow, and pointed. The tail is nearly as long as the wing and is slightly rounded.

Male Brewer's Blackbird (*Euphagus cyanocephalus*) has purplish, not green, gloss on the head, and its bill is thicker at the base than in the Rusty Blackbird. Like the Rusty Blackbird, the male Brewer's Blackbird has a yellow iris. In the fall, the 2 species can be confused because the male Brewer's Blackbird can have some rust-colored feather edgings. The Brewer's Blackbird never has such coloration on the tertials, however, and its longer tail (92–104 mm) further distinguishes it from the Rusty Blackbird (tail 83–92 mm) (Pyle et al. 1987). Female Brewer's Blackbirds are gray-brown (not slate gray) and have dark eyes. Rusty Blackbird shape and coloration suggest a short-tailed grackle (*Quiscalus*) (Peterson 1947). The Common Grackle (*Quiscalus quiscula*) is larger overall (28–34 cm) with a more robust bill and long, wedge-shaped tail.

DISTRIBUTION

THE AMERICAS

Breeding range. Figure 1. From n. Alaska (Kotzebue Sound, Barrow), n. Yukon (Porcupine River, Kings Point), n. Mackenzie (Mackenzie Delta, Fort Anderson), s. Keewatin (Nueltin Lake), n. Manitoba (Churchill, York Factory), n. Ontario (Fort Severn, James Bay), n. Quebec (Fort Chimo, Lake Guillaume-Delisle, Koroc River), and central Labrador (Nain, Makovila) and Newfoundland south to s. Alaska, s.-central British Columbia east of coastal ranges (Kamloops, Penticton) (R. W. Campbell pers. comm.), s.-central Alberta (Calgary, Red Deer, Banff, Jasper) (Godfrey 1986) central Saskatchewan (Big River, Emma Lake), central Manitoba (Riding Mountain National Park), w. and s.-central Ontario (Thunder Bay, Algonquin Park), s. Quebec (La Vérendrye Park, Petite-Rivière, Harrington-Harbour, Notre-Dame-des-Bois, Anticosti and Magdalen islands), s. Vermont (Laughlin and Kibbe 1985), n. New Hampshire (Foss 1994), the Maritime Provinces of e. Canada, and central and e. Maine (Oxford to Washington counties; Am. Ornithol. Union 1983, Godfrey 1986, Adamus 1987, Erskine 1992). Also breeds in the Adirondack Mtns. of ne. New York (Andrle and Carroll 1988) and at higher elevations in Berkshire Co., w. Massachusetts (Veit and Petersen 1993).

Winter range. Primary winter range from s. Massachusetts, se. New York, se. Pennsylvania, s. West Virginia, n. Ohio, extreme s. Michigan, se. Wisconsin, central Iowa, and e. Nebraska south through eastern portions of Kansas, Oklahoma, and Texas to the Gulf Coast and n. Florida (Christmas Bird count data). Also winters very locally from primary winter range north to s. Maine (Falmouth), central New Hampshire, s. Ontario (Kitchener, Reaboro, Toronto, Kingston), n. Minnesota, and s. Manitoba (Portage la Prarie) and west to w. South Dakota and w. North Dakota; also in s. Canada from s. Saskatchewan (Eastend) and central Alberta (Camrose) to s. and coastal British Columbia and coastal se. Alaska. Very small numbers also winter on the plains of e. Colorado (Andrews and Righter 1992). Irregular to s. Florida (Kushlan and Paterson 1972). Annual but very rare winter visitor to remaining portions of w. and sw. U.S., particularly California (Small 1994). Has been recorded south to nw. Sonora and ne. Baja California, Mexico (Howell and Webb 1995). Casual to Pribilof I., AK (Gabrielson and Lincoln 1959). Four records from Bermuda (Amos 1991).

OUTSIDE THE AMERICAS

Accidental in Siberia and Greenland (Am. Ornithol. Union 1957, 1983). Also recorded 4 Oct 1881 in Wales and Jul–Aug 1938 in London, the latter record probably an escape (Cramp and Perrins 1994).

HISTORICAL CHANGES

No known changes reported.

FOSSIL HISTORY

No known fossils.

SYSTEMATICS

GEOGRAPHIC VARIATION

In e. Canada, fall birds have darker rusty feather edgings than birds elsewhere (Godfrey 1986).

SUBSPECIES; RELATED SPECIES

Two subspecies recognized (Am. Ornithol. Union 1957), *Euphagus carolinus carolinus*, which occupies most of the species' range, and the darker *E. c. nigrans* (Burleigh and Peters 1948), which breeds in Newfoundland, Nova Scotia, Magdalen I. (Quebec), and possibly e. New Brunswick. Compared to *E. c. carolinus*, *E. c. nigrans* males are more intensely black, with a bluish rather than greenish gloss; females are darker and clearer gray with upperparts having an apparent bluish gloss (Peters and Burleigh 1951). Individual *E. c. nigrans* have been recorded in winter in N. Carolina and Georgia (Am. Ornithol. Union 1957).

Relationship to other species not studied, biochemically or otherwise. Brewer's Blackbird is probably the closest relative; *Euphagus* may be more closely related to grackles than to *Agelaius* blackbirds (Lanyon 1994).

MIGRATION

NATURE OF MIGRATION IN THE SPECIES

Migrates annually between breeding range in Alaska, Canada, and ne. U.S. and wintering grounds in s. and e.-central U.S. Apparently migrates diurnally (Baird and Nisbet 1960). Known to have landed on ships 200–400 km off the New England coast during spring (Abbott 1962) and fall (Gross 1960).

TIMING AND ROUTES OF MIGRATION

Northward migration through e. U.S. Mar–May (Barrows 1912, Forbush 1927, Todd 1940). Spring arrival times in Wisconsin lag behind those of the Red-winged Blackbird (*Agelaius phoeniceus*) and Common Grackle (Robbins 1991). In Illinois, peak migration in late Mar (Bohlen 1989); in Ohio, mid-Mar to Apr (Peterjohn 1989); in e. North Dakota, late Apr, but some individuals arrive first week of Apr (MLA). Small groups arrive on breeding grounds in Alberta by mid-Apr (Semenchuk 1992) and in Ontario by late Mar (James 1991). Average arrival in Nova Scotia is 24 Mar (Bent 1958).

On southward migration, passes through Massachusetts Sep–Nov (Forbush 1927) with peak in early Oct (Veit and Petersen 1993). Peak numbers in Ohio are 15 Oct–15 Nov (Peterjohn 1989). Average fall arrival in Chicago, IL, is 26 Sep (Bohlen 1989). Southward migration from Alberta is later than that of Brewer's Blackbird (Henderson 1937). Migrants arrive in Wisconsin in late Sep, after most Brewer's Blackbirds have departed (Robbins 1991). In e. North Dakota, fall migrants arrive in mid-Oct but peak in Nov (MLA). Species arrives at wintering grounds in se. U.S. by mid-Oct (Sprunt and Chamberlain 1970, Imhof 1976). Occurs irregularly during fall migration in Colorado (Andrews and Righter 1992). Although migration occurs mostly east of the Rocky Mtns., sightings suggest a small, but regular, migration through the Great Basin area to sw. U.S. and Baja California (McCaskie 1971, Small 1994).

MIGRATORY BEHAVIOR

Often joins mixed flocks with other blackbird species (Todd 1940, Sprunt and Chamberlain 1970, Robbins 1991), but also flocks as single species, sometimes exceeding 1,000 birds (Robinson 1990, Robbins 1991). Spring migration has been characterized as "spectacular, noisy, and ubiquitous" (Bent 1958: 283). Large numbers pass through a region relatively quickly. When flushed from a field, a feeding flock often lights in tops of trees, all birds facing the same direction, calling noisily (Beal 1900).

In late summer, after the breeding season, mixed-age flocks begin to form, and southward movements begin in Sep. Fall migrants associate with other blackbird species; also with American Robins (*Turdus migratorius*) and Blue Jays (*Cyanocitta cristata*) (Brewster 1906). No information to suggest segregation of age/sex classes in migration.

CONTROL AND PHYSIOLOGY

No information available.

HABITAT

BREEDING RANGE

Wet coniferous and mixed forests from northern edge of tundra southward to beginning of deciduous forests and grasslands. Frequents fens, alder (*Alnus*)–willow (*Salix*) bogs, muskegs, beaver ponds, and other openings in the forest such as swampy shores along lakes and streams (Flood 1987, Semenchuk 1992). In the Adirondack Mtns., NY, nests in spruce (*Picea*)–sphagnum (*Sphagnum*) bogs and swamps, particularly along edges of forest openings (Bull 1974, Peterson 1988). Exceptionally, on Cape Breton I., Nova Scotia, drier sites such as pasture edges are used (Erskine 1992).

In Vermont (Ellison 1990), key features of nesting habitat are large numbers of conifer saplings, especially balsam fir (*Abies balsamea*), and dense foliage 2–4 m above ground. Disturbance can be favorable to this species; e.g., nests found in modest openings regenerating from clearcuts (Ellison 1990). Also fire, windthrow, and beaver activity appear to create sufficient openings in mature woodland for nesting to occur.

SPRING AND FALL MIGRATION

Forages in stubble, pasture, plowed fields, and edges of swamps. Fall migrants also frequent

wooded areas, particularly for roosting (Brewster 1906, Bent 1958). Occasionally roosts on the ground in open fields (A. R. Stickley pers. comm.), sometimes with Red-winged Blackbirds (Bohlen 1989).

WINTER RANGE

Swamps, wet woodlands, and pond edges, usually not associated with other blackbirds (Rosenberg et al. 1991, Sibley 1993). In S. Carolina, cypress (*Toxodium*) lagoons, stream and pond borders, and adjacent fields (Sprunt and Chamberlain 1970). Cedar (*Juniperus*) thickets fringing open marsh, and swampy woodlands; small flocks feed in open fields, often near marshland (Burleigh 1958). Hardwood bottomlands in Arkansas, usually in small groups along creeks (Meanley 1972, R. A. Dolbeer pers. comm.). Occurs at all heights in wooded habitat, but stays mostly near the ground (Dickson and Noble 1978).

FOOD HABITS

FEEDING

Main foods taken. Feeds opportunistically year-round on both plant and animal matter. Winter foods include acorn mast, pine (*Pinus*) seeds, and some fruit (Meanley 1995). Grasshoppers (Orthoptera) form a major part of the diet except during Dec–Mar (Beal 1900). Summer diet is primarily aquatic insects and other animal food (Martin et al. 1951).

Microhabitat for foraging. Feeds mostly on the ground, particularly along edges of ponds, streams, and other wetlands. Also in open pasture, agricultural fields, and feedlots. In winter, sometimes feeds in trees on pine seeds, fruits, and berries (Meanley 1995). In Alaska, sometimes forages in dumps with gulls (*Larus*) (Gabrielson and Lincoln 1959).

Food capture and consumption. Bill and skull morphology and jaw musculature particularly well suited to insectivorous diet (Beecher 1951). Searches for food along pond and stream margins, often wading in shallow water. Will not only plunge bill into the water after insect larvae and crustaceans, but sometimes the whole head, similar to a Solitary Sandpiper (Forbush 1927). Forages in the water from logs or debris. Small sticks picked out of submerged litter are sometimes held by the feet and torn open with the bill to reveal caddis-fly (Trichoptera) larvae (Ellison 1990). Inspects rotten wood at ends of logs, excavating it to obtain insect larvae. Also gleans prey from moss and litter and from under twigs and other debris.

Like European Starlings (*Sturnus vulgaris*) and other blackbirds, exposes prey in soft mud and loose soil by inserting bill and opening it to loosen the substrate. Sometimes hawks for mosquitoes (Cade 1953) or emerging caddis-flies (Ellison 1990). Secures bits of acorn from beneath trees where Common Grackles are feeding on acorns, and may even steal acorns from grackles when their attention is diverted (Meanley 1972, 1993). Also feeds on fallen acorns crushed by vehicles (Droege 1991).

Often feeds in mixed flocks with Common Grackles and other blackbirds. In late summer and fall, eats ripening corn by sucking out the contents of the developing kernels or swallowing the kernels whole (Brewster 1906).

Attacks, kills, and sometimes eats other birds. On a snow-covered wintering area in e. Texas, Rusty Blackbirds and large grackles (Boat-tailed [*Quiscalus major*] or Great-tailed [*Q. mexicanus*]) attacked and killed Common Snipe (*Gallinago gallinago*) and American Robins, then fed on the heads (Deane 1895). During a May cold snap in the Northwest Territories, Rusty Blackbirds attacked several White-crowned Sparrows (*Zonotrichia leucophrys*) and 1 American Tree Sparrow (*Spizella arborea*), killing 2 of the White-crowned Sparrows (Campbell 1974). Later, Rusty Blackbirds were observed feeding on carcasses of a White-crowned Sparrow and a Lapland Longspur (*Calcarius lapponicus*). In Jan in Oklahoma, a Rusty Blackbird fed on an American Goldfinch (*Carduelis tristis*; Messerly 1979). During an unusual late-Dec snowstorm in Brunswick Co., N. Carolina, a Rusty Blackbird attacked and killed a moribund Brown-headed Cowbird (*Molothrus ater*) and twice knocked an American Goldfinch out of the air (Woodruff and Woodruff 1991). Does not always eat such victims (Long and Russ 1968, Wilson 1968); harsh, cold weather and probable food shortage characterized each occasion.

DIET

Major food items. In winter and during migration, plant foods consist mainly of crops (corn, oats, wheat) and weed seeds (*Setaria, Panicum, Ambrosia*), as well as grape (*Vitis*), blackberry (*Rubus*), elderberry (*Sambucus*), oak (*Quercus*), and beech (*Fagus*) (Martin et al. 1951). In fall, willow oak (*Quercus phellos*) acorns are a favorite food in Great Dismal Swamp, VA; also eats loblolly pine (*Pinus taeda*) seeds and fruits of American holly (*Ilex opaca*), Hercules club (*Aralia spinosa*), flowering dogwood (*Cornus florida*), and blackgum (*Nyssa sylvatica*) (Meanley 1995). Throughout the year, a variety of invertebrates are eaten, including aquatic beetles and their larvae, grasshoppers, spiders, snails) and crawfish. Vertebrate prey items include salamanders and small fish (Beal 1900, McCaskie 1971). Aquatic insects and dragonflies are fed to nestlings (Ellison 1990).

Quantitative analysis. Beal (1900) examined 132 stomachs of birds collected in every month except

Jun and Jul. Overall, vegetable food (grain, seed, fruit, mast) amounted to 47% (by volume) of the diet. Predominant animal foods: scarab beetles (2% overall, 11.7% in Apr), other beetles (mostly aquatic, 10.1% overall), caterpillars (2.5% overall, 11.7% in May), grasshoppers (12% overall, > 40% in Aug and Oct), spiders and myriapods (4% overall, 23% in Aug).

FOOD SELECTION AND STORAGE

In picking through small sticks amid pond debris, one bird selected some sticks, held them in its feet, and opened them with its bill; weight of the stick may be a cue to the presence of caddis-fly larva within (Ellison 1990). No food storage reported.

NUTRITION AND ENERGETICS

No information.

METABOLISM AND TEMPERATURE REGULATION

No information.

DRINKING, PELLET-CASTING, AND DEFECATION

No information.

SOUNDS

VOCALIZATIONS

Development. No information.

Vocal array. Both sexes sing. Male song roughly 7 s, with variable introductory notes, some of wide frequency range (Fig. 2A), others with relatively pure tones, ending in a 3- to 4-s trill at around 4 kHz (Fig. 2B). To some, male song resembles rusty hinges and is "far from musical" (Peters and Burleigh 1951); others describe song as more musical than those of other blackbirds (Bendire 1895). This disparity may arise because male possesses 2 song types, the different functions of which are not known. One song is rhythmic, begins with 2–3 musical notes, and ends in a higher, more squeaky note (*tolalee*); the other is a less rhythmic, rapid repetition of a 3-note phrase, also rising in pitch (*kawicklee*) (Saunders 1935). Paraphrased as *koo-a-lee* and *kush-a-lee* (Fig. 2B) (Peterson 1947) or *ksh-lay* (Fig. 2A) (Peterson 1980). Male songs are often interspersed with harsh *chek* call notes (Fig. 2A). When singing, male droops his wings slightly and fans his tail. Call notes are accompanied by rapid down and up flicking of the tail (Ellison 1990).

Female sings while on the nest in response to male's song, and after being flushed from nest while brooding young. As with the male song, female song is interspersed with call notes. Female song has not been described.

Also produces a down-slurred whistle (Fig. 2C), function of which is not known. In spring migration, call notes are difficult to distinguish from calls of tree frogs (*Hyla crucifer*; Brewster 1906) or wood frogs (*Rana sylvatica*; Forbush 1927). Two-syllable call (*Conk-ee*) uttered by male bringing food for incubating female (Kennard 1920).

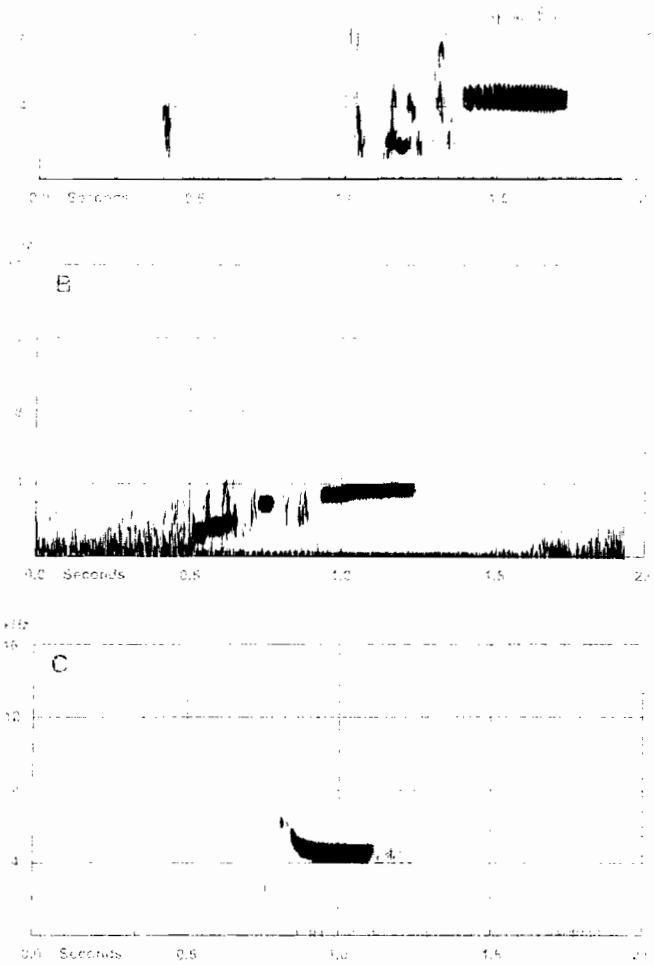


Figure 2. (A) *Chek* call and song of male Rusty Blackbird (Borror Laboratory of Bioacoustics [BLB] #17558, Tompkins Co., NY, 16 Apr 1990). (B) Song of male Rusty Blackbird with purer-tone introductory notes (Florida Museum of Natural History Bioacoustics Laboratory and Archives 745–13, cut 20, Crabb's River, Newfoundland). (C) Down-slurred whistle from Rusty Blackbird, sex not known (BLB #8847, Franklin Co., OH, 23 Apr 1967). Sonograms prepared by staff of the BLB, Ohio State University.

Phenology. Both sexes sing on the breeding grounds. Male sings during spring (Mar–Apr) and fall (Oct) migration (Saunders 1935, Bohlen 1989, Rosenberg et al. 1991).

Daily pattern of vocalizing. No information.

Places of vocalizing. Male song perches for territory establishment and maintenance not described. Female sings while on the nest, incubating. Male with food calls to his mate from a conspicuous perch, and the female goes there to obtain the food (Kennard 1920, Hoffman and Hoffman 1982).

Repertoire and delivery of songs. Male appears to have 2 song types (Saunders 1935, Fig. 2), but repertoire size and variation need study.

Social context of vocalizations. Male song probably used for territory establishment. Male sings as female gathers nest material and perches nearby to sing as she constructs the nest (Hoffman and Hoffman 1982). Female sings in response to male song and to playback tapes, suggesting that female song functions in maintaining the pair bond and possibly territory maintenance (Ellison 1990). No information on species and individual recognition.

NONVOCAL SOUNDS

None known.

BEHAVIOR

LOCOMOTION

Forages on the ground, walking, running, or wading in shallow water, sometimes up to its belly, like a sandpiper (Todd 1940). Flight speed recorded as 30–37 km/h (Wood 1933).

SELF-MAINTENANCE

No information.

AGONISTIC BEHAVIOR

None reported.

SPACING

Territoriality. Loosely colonial (Orians 1985). Nests never observed closer than 0.4 km (Kennard 1920). In Ontario, not colonial and rarely seen in large numbers even in middle of the breeding range (Flood 1987). In Vermont, Ellison (1990) recorded 8 isolated pairs but noted that "colonial groups" occur in areas where water levels fluctuate. Isolated pairs, in contrast, occupy wetlands near pond inlets where water levels are more reliable. In Newfoundland, birds tend to form nesting colonies more than elsewhere, with small groups of several pairs found nesting in boggy areas and wet lowlands with heavy underbrush (Peters and Burleigh 1951). Similarly, in Labrador the species "prefers to nest in small, scattered colonies" (Todd 1963). Geographic variation and influence of habitat variables on spacing and social organization need further study.

SEXUAL BEHAVIOR

Mating system. Monogamous, but loose colonial social structure may give rise to occasional extra-pair matings (Ellison 1990).

Pair bond. In a male display, apparently directed to female, the tail is spread, bill wide open, and a "series of squeaking notes" produced (Townsend 1920). Pair bonds are probably maintained through vocal behavior (Ellison 1990) and by male bringing food for the incubating female (Kennard 1920, Hoffman and Hoffman 1982). The food is not delivered to the female at the nest but to a conspicuous nearby perch. The female joins the male there, assumes a begging posture with fluttering wings, takes the food, and flies off (Hoffman and Hoffman 1982).

Extra-pair copulations. None recorded.

SOCIAL AND INTERSPECIFIC BEHAVIOR

Degree of sociality. Often gregarious during migration and in winter, but single-species flocks also common (Robinson 1990, Robbins 1991). Joins roosts of up to 20 million birds, predominantly Red-winged Blackbirds, Brown-headed Cowbirds, and grackles (Neff and Meanley 1952). During the nesting season, groups of adults accompany fledglings from multiple nests (Ellison 1990).

Nonpredatory interspecific interactions. In winter and while migrating, often forages in mixed flocks with other blackbirds. Salvages bits of acorn dropped by Common Grackles, and occasionally steals whole acorns from grackles (Meanley 1972, 1993). During the breeding season, no aggressive interactions noted between Common Grackles and Rusty Blackbirds foraging together, but foraging males are attacked and displaced by male Red-winged Blackbirds (Ellison 1990). This contrasts with the sociality displayed during winter and migration.

PREDATION

On wintering grounds, flocks prone to attack by accipters (*Accipiter*; Lewis 1931). Also preyed on by falcons (*Falco*) and owls (Cade 1951, Fritzell and Thorne 1984). Agitated behavior by a pair of Rusty Blackbirds near their nest in response to Gray Jays (*Perisoreus canadensis*) suggests the latter is a potential nest predator (Hoffman and Hoffman 1982).

BREEDING

PHENOLOGY

Pair formation. Presumably occurs on breeding grounds, but no data.

Nest-building. In n. New England, begins nest-building in Apr (Kennard 1920). On 12 Jun in n. Minnesota, a female carried nest material several

times as male perched nearby and sang (Hoffman and Hoffman 1982).

First and later broods/season. Figure 3. In Vermont, clutches generally initiated first–second week of May, with birds incubating into mid-Jun (Ellison 1990). Timing is probably similar in New Hampshire and Maine (Kennard 1920). Complete clutches collected as early as 11 May (Nova Scotia) and as late as 12 Jul (Maine). Extreme egg dates in Ontario: 4 May and 22 Jun (James 1991); in New York, 7 May and 15 Jun (Bull 1974). Nestlings reported from the third and fourth weeks of May (Vermont; Kennard 1920) through mid-Jul (New York; Andrle and Carroll 1988). Fledglings as early as 12 Jun in Vermont (Ellison 1990) and in mid-Jun on Seward Peninsula, AK (Kessel 1989), and Magdalen I., Quebec (Bent 1958).

NEST SITE

See Figure 4. Almost always close to water. In living and dead trees and shrubs and atop stumps, 0.5–6 m above the ground, or sometimes directly over water. Uses spruce, fir, tamarack (*Larix*), willow, birch (*Betula*), alder, and other species, depending on location. Vegetation is customarily dense and thick, and nests are often situated among a network of many small side branches. Ground nests at the base of shrubs reported from Alaska (Kessel 1989) and Ontario (Peck and James 1987).

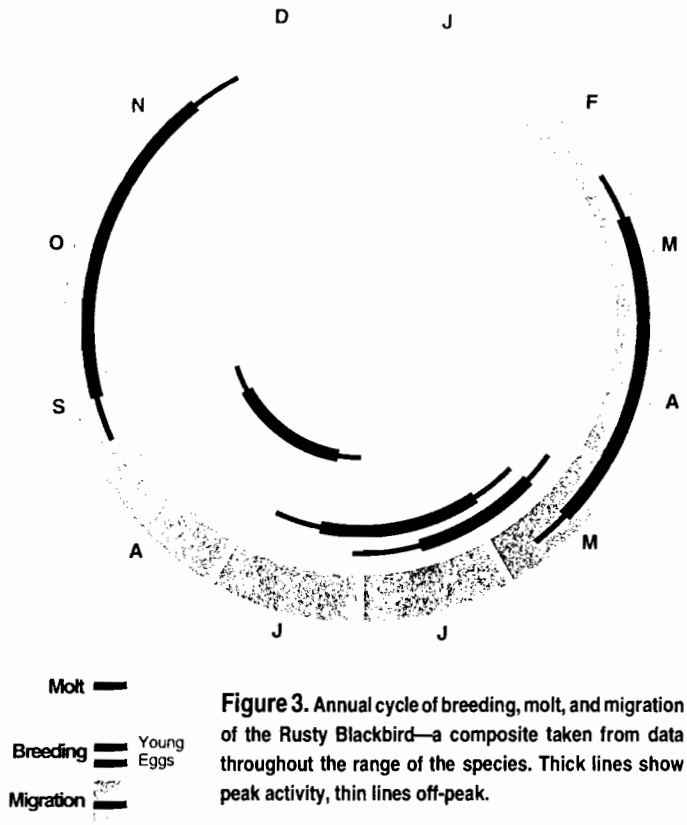


Figure 3. Annual cycle of breeding, molt, and migration of the Rusty Blackbird—a composite taken from data throughout the range of the species. Thick lines show peak activity, thin lines off-peak.

NEST

Construction process. Presumably solely by female (Orians 1985), but supporting data needed. Nest construction takes approximately 7 d, based on renesting intervals (Kennard 1920).

Structure and composition matter. Nests are substantial and bulky. Outer framework is constructed with twigs, dried grasses, and *Usnea* lichen. Within this framework, a bowl 5–6 cm deep and 8.5–9.5 cm across is formed 5–10 cm thick out of wet, rotting vegetation. It is pressed into the surrounding stick framework and hardens when dry. The bowl is then lined with green leaves of grass, dried grass, and plant fibers; lining of fine green grasses always added (Kennard 1920). In New England, completed nests are 14–20 cm across and 8–9 cm deep (Kennard 1920). In Ontario, 13–18 cm across and 4–7 cm deep inside (Peck and James 1987).

Microclimate. Nests often against trunk of tree, usually amid thick layers of small branches. Open from above, but thick foliage usually provides overhead concealment.

Maintenance or reuse of nests. Nests apparently not reused by Rusty Blackbirds, but they are used frequently by Solitary Sandpipers (Henderson 1937, Oring 1968). New nests constructed for successive nesting attempts.

EGGS

Shape. Oval to short oval.

Size. Mean (n = 50) reported as 25.8 x 18.6 mm (range 29.8–23.1 x 20.1–16.3; Bent 1958), virtually the same as that reported by Kennard (1920). Measurements of 63 eggs in the collection of the Florida Museum of Natural History (FMNH) were similar: mean (± SE) 25.85 ± 0.15 x 19.01 ± 0.08 mm (range 28.42–23.13 x 20.07–17.98, n = 63). Calculated volume averaged 4.79 ± 0.05 cm^3. Egg size varies more among than within clutches, and variation among clutches in the FMNH collection explained 95% of the total variation for length and 88% for width.

Mass. Mass of fresh, whole egg not available.

Color. Background varies from pale blue-green to pale gray. Markings are dark brown to light brown and can vary from heavy to light. Eggs are marked similarly within clutches but vary considerably among clutches. Last egg laid may be less heavily marked than earlier eggs (Kennard 1920).

Clutch size. Mode of 5 in collections of FMNH (mean = 4.53 ± 0.15 [SE], range 3–5, n = 17) and Western Foundation of Vertebrate Zoology (WFVZ; mean = 4.47 ± 0.08, range 3–6, n = 80). In Ontario, 24 nests averaged 3.79 eggs (± 0.20, range 1–5), with 4 the most common (Peck and James 1987).

Figure 4. Rusty Blackbirds construct large, robust nests that are often used in subsequent years by other species, such as the Solitary Sandpiper. Normally, the female alone constructs the nest. Nest sites are seldom far from water. Drawing by T. Angell.

Egg-laying. Eggs are laid daily. Replacement clutches are produced. Kennard (1920) collected each of the first 3 nests produced by a pair in Maine, and the birds built new nests and laid new clutches after intervals of 12 d (5 eggs), 11 d (4 eggs), and 14 d (4 eggs), respectively (i.e., no. of days between nest loss and subsequent clutch completion). A nest record from Nova Scotia showed a new nest and replacement clutch of 4 eggs (partially incubated) 15 d after the pair's first nest had been collected (WFVZ). Also in Nova Scotia, 2 nests of 4 eggs each were collected on 12 May, and the next day each pair was constructing a new nest; on 23 and 24 May, clutches of 5 eggs were collected from the 2 new nests (Bent 1958).

INCUBATION

Onset of incubation. Usually begins with first egg, particularly early in spring when weather is cold (Kennard 1920).

Incubation patch. Not known.

Incubation period. Reported to be 14 d (Bendire 1895) but needs confirmation.

Parental behavior. Female alone incubates and will tolerate close (< 2 m) approach to the nest. Some incubating females leave the nest quietly when disturbed; most stay nearby and utter alarm calls, the intensity of which increases as incubation proceeds (Kennard 1920). Male brings food for incubating female to nearby conspicuous perches where she joins him to feed (Hoffman and Hoffman 1982).

Hardiness of eggs. No data.

HATCHING

Preliminary events and vocalizations. No data.

Shell-breaking and emergence. At a nest in Maine, Kennard (1920) found 3 young a few hours old; fourth egg hatched the next morning.

Parental assistance and disposal of eggshells. No data.

YOUNG BIRDS

Condition at hatching. Newly hatched young are covered with natal down, described as "long, thin, fuscous" (Kennard 1920).

Growth and development. Development "rapid," but no quantitative growth data available. By day 5, wing feathers are "well under way," other feather tracts have started, and the eyelids are slightly slit. By day 10, young are covered with feathers although down still protrudes, and eyes are almost wide open (Kennard 1920).

PARENTAL CARE

Brooding. Apparently by female only. At one nest, male helped feed the young and spent the night in the vicinity (Kennard 1920). Nest defense consists of alarm calls and tail-flicking at the close approach of an intruder (Ellison 1990).

Feeding. Both parents feed the chicks. Adults bring whole prey to nestlings, including recently metamorphosed dragonflies. No data on feeding rates.

Nest sanitation. Fecal sacs removed by female (Kennard 1920).

COOPERATIVE BREEDING

Not observed, but on 3 occasions Ellison (1990) noted "groups of adult blackbirds accompanying fledglings from several nests." This could represent several pairs gathering offspring into creches for protection, but further study is needed.

BROOD PARASITISM

Apparently rare; species generally nests north of range of Brown-headed Cowbird and in habitat not favored by that parasite. Henderson (1937) and Friedmann (1963) each mentioned 2 instances from Alberta, but neither gave details.

FLEDGLING STAGE

Kennard (1920) observed 3 young climb from the nest 11 d after hatching, still unable to fly. For 2 d they hopped and climbed in bushes with both parents closely attending. First flight was 13 d posthatch. Ellison (1990) observed fledglings still with adults 4 wk after leaving the nest. In Vermont, vegetation used by dependent fledglings differed from that at the nest site in having more alder and spruce, although total foliage density remained high. Also, fledglings tended to be closer to the adults' foraging areas than were nest sites (Ellison 1990).

IMMATURE STAGE

Not studied.

DEMOGRAPHY AND POPULATIONS

MEASURES OF BREEDING ACTIVITY

Age at first breeding. Probably 1 yr of age, but confirmation needed.

Clutch. Five is the most common clutch size in the Florida Museum of Natural History (FMNH; mean = 4.53 ± 0.15 [SE], range 3–5, n = 17) and the Western Foundation of Vertebrate Zoology collections (WFVZ; mean = 4.47 ± 0.08, range, 3–6, n = 80).

Annual and lifetime reproductive success. Few data. Of 14 nests located by Kennard (1920), only 1 appeared deserted. Of the 6 nests found with newly hatched young, only 1 contained an addled egg. Thus, based on a limited sample, hatching success appears high. In one brood followed closely, 3 of 4 nestlings fledged.

Number of broods normally reared per season. Probably 1, but renesting following nest failure is likely. Kennard (1920) collected 3 successive nests of 1 pair, which then built a fourth. Replacement clutches laid by 2 pairs in Nova Scotia following collection of their initial clutches (Bent 1958). Ellison (1990) noted that a clutch incubated in mid-Jun was probably a renest.

LIFE SPAN AND SURVIVORSHIP

A bird banded in Arkansas on 6 Apr 1931 was shot on 30 Jan 1939, for a life span of at least 8 yr, 9 mo (Cooke 1942). In subsequent publications (Kennard 1975, Klimkiewicz and Futcher 1987), the age of this same individual is given as 8 yr, 7 mo and the banding date as 4 Jun 1939. The original banding date and age are probably correct as Rusty Blackbirds are not known to be in Arkansas past early May (James and Neal 1986).

DISEASE AND BODY PARASITES

A host to lice (Peters 1936) and nasal mites (Pence 1972). Among blood parasites, *Leucocytozoon* was found in 19 of 23 (Greiner et al. 1975) and 1 of 8 (Williams and Bennett 1978) birds examined. Occurrence of *Haemoproteus*, *Trypanosoma*, and microfilaria also reported (Greiner et al. 1975). Sarcocystis recorded (Locke and Knisley 1965).

CAUSES OF MORTALITY

Nest failure rate appears to be low, but transition to independence could be a critical period. Predation by owls, accipters, and other raptors occurs (see Behavior: predation), but impact on populations is not known. Food shortages during severe weather in winter and late spring could cause substantial mortality and may be cause of predatory attacks by Rusty Blackbirds on smaller passerines (e.g., Campbell 1974; see Food Habits: feeding). Substantial mortality to local populations may occur when Rusty Blackbirds are in mixed-species winter roosts subjected to blackbird control in the s. U.S. (Stickley et al. 1986; see Conservation and Management: effects of human activity).

RANGE

Natal philopatry and dispersal. No data.

Fidelity to breeding site. Recovery records supplied by the National Biological Service's Bird Banding Laboratory include 1 bird from Saskatchewan and 2 from Maine that were banded one breeding season and recovered within the same 10-min block 1–2 breeding seasons later.

Fidelity to winter range. No data.

POPULATION STATUS

Numbers. Density typically low, even in center of breeding range (Flood 1987). In Vermont, 1990 spring/summer surveys in Caledonia and Essex counties (combined area 3,411 km^2) indicated 65–90 birds (Ellison 1990). In initial 15-yr Breeding Bird Survey (BBS) compilation (1965–1979), Rusty Blackbird not numerous enough to merit discussion (Robbins et al. 1986)—probably due to its northern distribution (beyond most census routes) as well as to its actual density. In 1977, 89 birds recorded on 32 routes (out of 1,832 total routes throughout North America). During 1965–1979, number of birds recorded/survey route ranged from 0.1 in New Hampshire and Vermont to 8.3 in Newfoundland. Breeding population estimate for the Maritime Provinces (1986–1990): 17,000 ± 2,600 pairs (Erskine 1992). In Ontario, this species occurred in 77 of 294 survey blocks; 3 of these 10-km^2 areas were estimated to hold >100 pairs, but most (81%) held ≤10 pairs (Flood 1987). In New York State, Rusty Blackbirds occurred in 3% (151) of the 5-km^2 blocks surveyed, with breeding confirmed in 51 of the 151 (Peterson 1988).

Winter population estimates are not available. Christmas Bird Count (CBC) data (Root 1988) confirm the species' gregariousness and therefore spotty distribution in the winter range. Usually represent <1% of very large mixed-species blackbird roosts (Neff and Meanley 1952, Stickley 1987, Dolbeer et al. 1995), so accurate estimates of this single species amid the others are difficult.

Trends. BBS data are too sparse for confident analysis of trends in individual states or provinces. Breeding bird populations east of the Mississippi River, for all of Canada, for all of the U.S., and for North America decreased (not significantly) during 1966–1991 but increased during 1982–1991. Ellison (1990) concluded that in Caledonia and Essex counties, Vermont, the species did not decline appreciably between 1981 and 1990. However, surveys at Fundy National Park, New Brunswick, revealed only 2 Rusty Blackbirds in 1992 compared to 18 in 1979 (D. S. Christie pers. comm.).

Recent preliminary analysis of CBC data made available by the National Biological Service through the CBC home page on the World Wide Web (WWW.IM.NBS.GOV/BBS/CBC.HTML) suggests a downward trend in Rusty Blackbird winter populations during 1959–1988. Conclusions based on this analysis should be made cautiously, however, and perhaps should await more complete analysis of the data (B. Peterjohn pers. comm.). Nevertheless, numbers of winter Rusty Blackbirds in the s. U.S. need to be documented regularly and accurately.

Clarification of this species' status is complicated by its relatively inaccessible breeding habitat and by the ease of confusing it with Brewer's Blackbird and Common Grackle (Flood 1987, Peterson 1988, Semenchuk 1992; see Distinguishing Characteristics). Winter counts are confounded by mixed-species blackbird aggregations in which the presence of this relatively uncommon species can be masked by vast numbers of Red-winged Blackbirds, grackles, starlings, and cowbirds.

CONSERVATION AND MANAGEMENT

EFFECTS OF HUMAN ACTIVITY

Collisions. Of >35,000 birds found dead at a tower in Leon Co., FL, during 1955–1973, 8 were Rusty Blackbirds (Stoddard and Norris 1967, Crawford 1974). All occurred in winter (25 Nov–4 Mar). No other collision mortality involving this species reported (MLA).

Degradation of habitat. Land-use practices that reduce wet woodland adversely affect the species. Clearcutting large areas not only removes Rusty Blackbird habitat but also opens areas to invasion by Common Grackles and Red-winged Blackbirds, species with which Rusty Blackbirds may have difficulty competing (Ellison 1990, Erskine 1992). Such practices could also encourage invasion by cowbirds into previously unoccupied areas.

Agricultural practices in the se. U.S. may benefit the species by providing feeding areas for migrating and wintering birds.

Rusty Blackbirds often nest on margins of beaver ponds (Peterson 1988, Ellison 1990). The near extirpation of beavers in New York in the 1890s may have seriously affected Rusty Blackbird populations there, whereas the recent recovery of beaver populations may have increased available nesting habitat and benefited the species (Peterson 1988).

Disturbance at roost sites. Forms mixed-species flocks/roosts in winter with starlings and other blackbirds. Such winter aggregations in s. U.S. regularly exceed 1 million birds and have been subjected to lethal control to reduce nuisance, health, and crop-damage problems (Stickley et al. 1986, Dolbeer et al. 1995). Rusty Blackbirds typically constitute <1% of such winter roosts, and effects of control measures on the overall population of the

species remain unknown. Declines in Common Grackle populations in the e. U.S. coincided with roost control programs in the mid-1970s (Robbins et al. 1986).

MANAGEMENT

Wet forested habitat preferred by Rusty Blackbirds is relatively inaccessible and somewhat inhospitable, so breeding populations may be in no imminent danger, but more careful monitoring, in addition to the Breeding Bird Survey, is needed to confirm this. Species is more opportunistic during migration and in wintering areas, thus special management would not appear to be necessary. Nevertheless, preliminary analyses of Christmas Bird Count trends in se. U.S. during 1959–1988 suggest that closer attention should be paid to wintering populations (see Demography and Populations: population status).

APPEARANCE

MOLTS AND PLUMAGES

Color names and numbers are from Smithe (1975).

Hatchlings. Covered with "long, thin, fuscous natal down" (Kennard 1920).

Juvenal plumage. Acquired by a Prejuvenal molt (Dwight 1900). By day 5, wing feathers are "well under way," other feather tracts have started, and the eyelids are slightly slit. By day 10, young are covered with feathers although down still protrudes, and eyes are almost wide open (Kennard 1920). In n. British Columbia, full-grown young in Juvenal plumage were being fed by adults In late Jul (Swarth 1922). In n. Minnesota, on 29 Jun, 3 brownish gray juveniles with dark eyes were being fed by 2 adults; the juveniles moved clumsily in the bushes but flew well (Hoffman and Hoffman 1981).

The entire plumage is slate colored (= dark gray, color 82) with olive brown (color 285) wash on back and throat. The tail is darker with greenish reflections. Tertials and wing-coverts edged with mars brown (color 223A).

Basic I plumage. Acquired by Prebasic 1 molt which begins in late Jul. Molt complete, except that many birds retain some underwing-coverts. Also, some birds retain tertials, otherwise all flight feathers are replaced (Pyle et al. 1987). Several birds collected at Upton, ME, on 5 Aug 1873 had nearly completed the Prebasic I molt. One male still retained dark gray Juvenal feathers on its head. All birds were molting wing and tail feathers. In each specimen, the pair of central rectrices extended approximately 7.5 cm beyond the rest, which were all the same length and just emerging (Brewster 1878). A young male collected in n. British Columbia on 9 Sep had completed the Prebasic 1 molt (Swarth 1924).

Male. Immatures resemble adults (Definitive Basic plumage) but have wider rusty and light brown feather emarginations, giving a browner appearance overall. The rusty color is extensive on the head, nape, and scapulars, and there is a broad superciliary stripe and nearly uniform edging in malar, chin, and throat regions. In certain light, some first-year birds have a distinct reddish appearance due to the extensive rusty feather edgings (Gabrielson and Lincoln 1959). The extent of the brownish feather edgings varies considerably.

Female. Plumage similar to Juvenal plumage but with slaty gray feathers edged with mars brown above (especially on the head), wood-brown (= amber, color 36) below (Dwight 1900). Wing and tail feathers lack the edging. Rump gray, flight feathers dark brown, lores and auriculars dull black. As in other species of blackbirds, first-year birds (both sexes) often have pale brown or grayish underwing-coverts which contrast with the black flight feathers (Pyle et al. 1987).

Definitive Basic plumage. Acquired by a complete Definitive Prebasic molt which begins in mid-Jul. A female collected on 20 Aug in n. British Columbia had nearly completed the molt (Swarth 1924).

Male. Entire feathering black as in breeding season (see below), but feathers of upperparts tipped with mars brown, broadly so on crown, hindneck, back, and scapulars, less so on rump, uppertail-coverts, tertials, and some wing-coverts. Conspicuous tawny to buff supercilliary stripe. Feathers of sides of head and neck tipped pinkish or cinnamon buff to grayish white. Feathers of cheeks and underparts tipped wood-brown, except for middle of abdomen which is sometimes immaculate (Oberholser 1974). Plumage not appreciably different from Basic I plumage except that rusty feather edgings are less extensive (Dwight 1900). Older birds may show scarcely a trace of the rusty edgings (Ridgway 1902).

There is no Prealternate molt. As in Basic I plumage, feather edgings wear off by spring to produce greenish black appearance. Entire feathering black to slate-black. Feathers of upperparts, including tail, with dull metallic greenish sheen, slightly more bluish on crown. Wing-coverts and outer webs of remiges as upperparts. Underparts similar to upperparts but duller. Undertail-coverts narrowly tipped with pale gray (Oberholser 1974).

Female. Feathering as in breeding season (see below), but crown, hindneck, back, and scapular feathers broadly edged with mars brown, uppertail-coverts, tertials, inner secondaries, and greater-coverts similarly but more narrowly edged. Rectrices sometimes narrowly tipped buffy or brownish. Conspicuous tawny to buff supercilliary stripe, but

Table 1. Linear measurements (mm) and mass (g) of Rusty Blackbirds from published sources.

	n	Mean (range)	Source
BILL LENGTH			
Male	7	19.6 (18.5–21.5)	Meanley 1967
Female	3	18.2 (17.5–19.0)	Meanley 1967
WING LENGTH			
Male	7	118.0 (115.5–123.5)	Meanley 1967
Male		114.6 (110.5–117.4)	Godfrey 1986
Male	100	(111–123)	Pyle et al. 1987
Female	3	110.0 (106–113)	Meanley 1967
Female		107.3 (103.1–112.4)	Godfrey 1986
Female	100	(101–113)	Pyle et al. 1987
TAIL LENGTH			
Male	7	93.1 (88.0–99.0)	Meanley 1967
Male		88.9 (85.0–94.5)	Godfrey 1986
Female	3	87.7 (83.0–91.0)	Meanley 1967
TARSUS LENGTH			
Male		31.4 (29.5–33.0)	Godfrey 1986
MASS			
Male	8	69.2 (63.9–80.2)	Meanley 1967
Male	91	64.3 (45.9–80.4)	Dunning 1984
Female	3	54.6 (52.8–57.7)	Meanley 1967
Female	105	55.2 (47.0–76.5)	Dunning 1984

sometimes obscure. Sides of head and neck with tawny to buff feather tips. Feathers of underparts, except middle of abdomen, tipped with wood-brown to grayish white.

No Prealternate molt. As in Basic I plumage, feather edgings wear off by spring to produce grayish appearance.

Upperparts deep mouse gray, sometimes slightly olive-brownish, and slightly glossed dull green. Tail fuscous-black with greenish gloss. Wings fuscous to fuscous-black with tips of coverts and outer webs of remiges as upperparts, but secondaries, tertials, and greater-coverts sometimes edged dark brown. Sides of head and neck along with underparts as upperparts but slightly paler (Oberholser 1974).

Aberrant plumages. Pure (Atkinson 1904) and partial (Deane 1879, Stickley 1987) albinism have been recorded.

BARE PARTS

Bill and gape. Black.

Iris. Dark in Juvenal-plumaged birds (Hoffman and Hoffman 1981), turning light yellow in fall (Bagg and Eliot 1937) and becoming conspicuously yellow in adults (Henderson 1987).

Legs and feet. Dark grayish brown (color 20) in young birds, becoming black (Dwight 1900).

MEASUREMENTS

Males longer and heavier than females (Table 1). Data are insufficient to examine geographic variation, but the wide range in body mass (Table 1) suggests that more detailed study of regional differences is warranted.

PRIORITIES FOR FUTURE RESEARCH

Numerous aspects of this species' biology merit further study. The status of breeding populations needs to be clarified; Breeding Bird Survey data are clearly insufficient to monitor this species. Christmas Bird Count data suggest a possible decline in wintering populations since 1959 which needs to be investigated more fully. Vocal behavior on the breeding grounds is not well understood, particularly the functions of the 2 types of male song and the function of the female song. Social organization during the nesting season appears variable and perhaps is influenced by the type and structure of the available habitat. Unambiguous evidence of colonial nesting is needed; also, factors governing whether the species nests singly or in colonies should be investigated.

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