

# Burdock, *Arctium* spp., at Delta Marsh, Manitoba

HEATHER L. HINAM<sup>1</sup>, SPENCER G. SEALY<sup>2</sup>, AND TODD J. UNDERWOOD

Department of Zoology, University of Manitoba, Winnipeg, Manitoba R3T 2N2 Canada

<sup>1</sup>Present Address: Department of Biological Sciences, University of Alberta, Edmonton, Alberta T6G 2E9 Canada

<sup>2</sup>Corresponding author [gsealy@cc.umanitoba.ca](mailto:gsealy@cc.umanitoba.ca)

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Exotic burdock (*Arctium* spp.) pose a risk of mortality for small native birds, such as the Ruby-throated Hummingbird (*Archilochus colubris*), which may become entangled in its burrs. At Delta Marsh, Manitoba, we found 11 hummingbirds and five individuals of four species of songbirds entangled on burdock in the dune-ridge forest over a 20-year period. Entangled birds were mostly migrants. Most hummingbirds caught were juvenile males, whereas the few songbirds were mostly adult males. We suspect that hummingbird entanglements resulted from an attraction to the purple flowers of burdock, but aggressive interactions with conspecifics and other factors may have been involved. Birds may be at a higher risk of entanglement at important migratory stopover sites, such as Delta Marsh, where both burdock and large numbers of birds are concentrated in a small area.

**Key Words:** exotic plants, burdock, *Arctium* spp., fatal entanglement, Ruby-throated Hummingbird, *Archilochus colubris*, passerines, mortality, Delta Marsh, Manitoba.

Exotic species often exert negative effects on the survival of native flora and fauna (Atkinson 1989). This is exemplified by the relationship between burdock (*Arctium* spp.) and small birds and bats in North America (McNicholl 1988, 1994). Four species of burdock were introduced from Eurasia into North America in the early 1600s (Gross et al. 1980; Harms 2001). All four species of burdock develop seed heads covered with burrs that stick to passing animals, thus dispersing the seeds (McNicholl 1988). These burrs are hazards for small birds and bats because individuals may become entangled in the hooked bracts and die (McNicholl 1988, 1994). The effect of such entanglements on bird populations may be magnified when the plants are concentrated in small areas where birds nest or forage during migration.

For many songbirds, the dune-ridge forest that separates the south shore of Lake Manitoba from Delta Marsh (50°11' N, 98°19' W), Manitoba, is an important breeding area (Goossen and Sealy 1982; MacKenzie et al. 1982) and migratory stopover site (den Haan 1996). Three species of burdock (*A. minus*, *A. lappa*, *A. tomentosum*) have been documented in the area, but Common Burdock (*A. minus*) is the most abundant, occurring along the edge of the marsh and in the ridge forest, as well as in ditches and at other disturbed sites (Shay 1999). The composition of the understory of the ridge forest has changed over the last 30 years and the amount of burdock apparently has increased (Kenkel and Graham 1994; S.G. Sealy, personal observations). With this apparent increase, Delta Marsh has the potential to become a trap line for small birds such as the Ruby-throated Hummingbird (*Archilochus colubris*). Indeed, this species has been one of the most

frequently discovered entangled in burdock (McNicholl 1988, 1994; Raloff 1998; Nealen and Nealen 2000). Here we document additional cases of mortality of Ruby-throated Hummingbirds and songbirds due to entrapment on the seed heads of burdock at Delta Marsh, Manitoba.

## Entanglements

Sealy and co-workers have studied songbird populations in the ridge forest at Delta Marsh since 1973, but it was not until 1983 that the first bird was found entangled on burdock. The decomposed remains of a Ruby-throated Hummingbird were discovered that spring, but death had occurred the previous year. Since then, 10 more hummingbirds have been found, all but one in August 1985 (Table 1). One of these was alive and released, leaving behind several feathers stuck to the burrs (Table 1). From 1977 to 1979, 1981 and 1983, hummingbirds were banded in conjunction with general songbird banding in the ridge forest from mid-May through the end of August. The timing of the entanglements in 1985 coincided with the fall migration of hummingbirds through the ridge forest in August (Figure 1). However, except for the live hummingbird, the dates of entanglement only approximate the time of death because the rates of decomposition and mummification are not known. Thus, some hummingbirds could have been killed earlier in August.

Despite sporadic searching since 1985, only one other entangled hummingbird was found, in 2002 (Table 1, Figure 2), but since 1994, five individuals of four other species have been found entangled fatally (Table 2). Another record consisted of only a few feathers from an unknown passerine species, possibly

TABLE 1. Records of Ruby-throated Hummingbirds entangled in burdock at Delta Marsh, Manitoba.

Date	Age/Sex <sup>1</sup>	Condition	Specimen No. <sup>2</sup>
19 May 1983	Unk/unk	Decomposed: overwintered, wings, ventral feathers attached	4986
15 August 1985	Unk/unk	Released, feathers stuck on burdock	2981 <sup>3</sup>
18 August 1985	HY/female	Recently caught (intact)	4982
18 August 1985	HY/male	Recently caught (intact)	4983
18 August 1985	Unk/unk	Partially decomposed: attached by ventral and wing feathers	4985
19 August 1985	HY/female	Recently caught	4981
19 August 1985	AHY/male	Partly decomposed	4984
19 August 1985	AHY/male, HY/male	Facing each other with burrs in between (fresh and mostly intact)	4987 A, B
21 August 1985	HY/male	Stuck across burr (fresh, mostly intact)	4980
14 September 2002	HY/female	Decomposed, sternum visible	4991

<sup>1</sup>Unk = unknown, HY = hatch year, AHY = after hatch year.

<sup>2</sup>Bird specimens deposited in the vertebrate collections of the Manitoba Museum, Winnipeg, Manitoba, Canada.

<sup>3</sup>Feathers deposited in the University of Manitoba Zoology Museum, Winnipeg, Manitoba, Canada.

TABLE 2. Records of songbird species entangled in burdock at Delta Marsh, Manitoba.

Species	Date	Age/Sex <sup>1</sup>	Condition	Specimen No. <sup>2</sup>
Unknown passerine	15 August 1985	Unk/unk	Feathers stuck on burr	2982 <sup>3</sup>
Golden-crowned Kinglet	30 October 1994	Unk/male	Wings and breast attached (fairly intact)	4976
Ruby-crowned Kinglet	2 November 1996	AHY/male	Left wing caught (fresh, intact)	4977
Common Yellowthroat	May 1999	AHY/female	Decomposed: overwintered, caught by one leg	4978
	13 May 2000	AHY/male	Decomposed: overwintered, caught by breast, both wings	4979
Yellow-rumped Warbler <sup>4</sup>	10 October 2002	HY/unk	Fresh, caught by right foot, feathers of right flank, left wing	4988

<sup>1</sup>Unk = unknown, HY = hatch year, AHY = after hatch year.

<sup>2</sup>Bird specimens deposited in the vertebrate collections of the Manitoba Museum, Winnipeg, Manitoba, Canada.

<sup>3</sup>Feathers deposited in the University of Manitoba Zoology Museum, Winnipeg, Manitoba, Canada.

<sup>4</sup>Banded 14 September 2002.

a sparrow (C. Dove, personal communication). This bird may have become entangled and freed itself; alternatively it may have been preyed upon or scavenged. Two Common Yellowthroats (*Geothlypis trichas*), a species that nests at Delta Marsh, were found in spring after apparently becoming entangled the previous year. One Golden-crowned Kinglet (*Regulus satrapa*) and one Ruby-crowned Kinglet (*R. calendula*), both boreal forest breeders and late migrants, were found freshly dead in the fall. In October 2002, a freshly dead Yellow-rumped Warbler (*Dendroica coronata*) was discovered less than one month after it had been banded in the ridge forest. All four of these species have been found trapped on burdock elsewhere (McNicholl 1988, 1994).

The sex and age of birds were identified where possible by characteristics of the plumage, feathers and bills (Pyle 1997). Of the hummingbirds entangled, five were males and three were females, whereas three songbirds were males and one was a female (Tables 1, 2). Six hummingbirds were juveniles and two were adults (Table 1). By contrast, three songbirds were adults and only one was a juvenile (Table 2).

## Discussion

Most birds entangled in burdock at Delta Marsh likely were migrants. Although Ruby-throated Hummingbirds nest at Delta Marsh (Underwood and den Haan 2000) in small numbers, all entanglements were discovered during their fall migration period through Delta Marsh (Figure 1). Among the other species killed on burdock, only the Common Yellowthroat breeds commonly at Delta Marsh (Underwood and den Haan 2000). The preponderance of migrants in our sample of burdock mortalities is interesting. Several small songbirds, such as the Least Flycatcher (*Empidonax minimus*) and Yellow Warbler (*Dendroica petechia*), nest at high densities in the ridge forest (Goossen and Sealy 1982; Briskie and Sealy 1989; S. G. Sealy, unpublished data), but neither species has been recorded entangled in burdock there, although the Least Flycatcher is a documented victim elsewhere (Underwood and Underwood 2001). Individuals of both species have been observed perched on stems of burdock (Sealy and Underwood, personal observations) and Sealy observed two male Yellow Warblers, one chasing the other

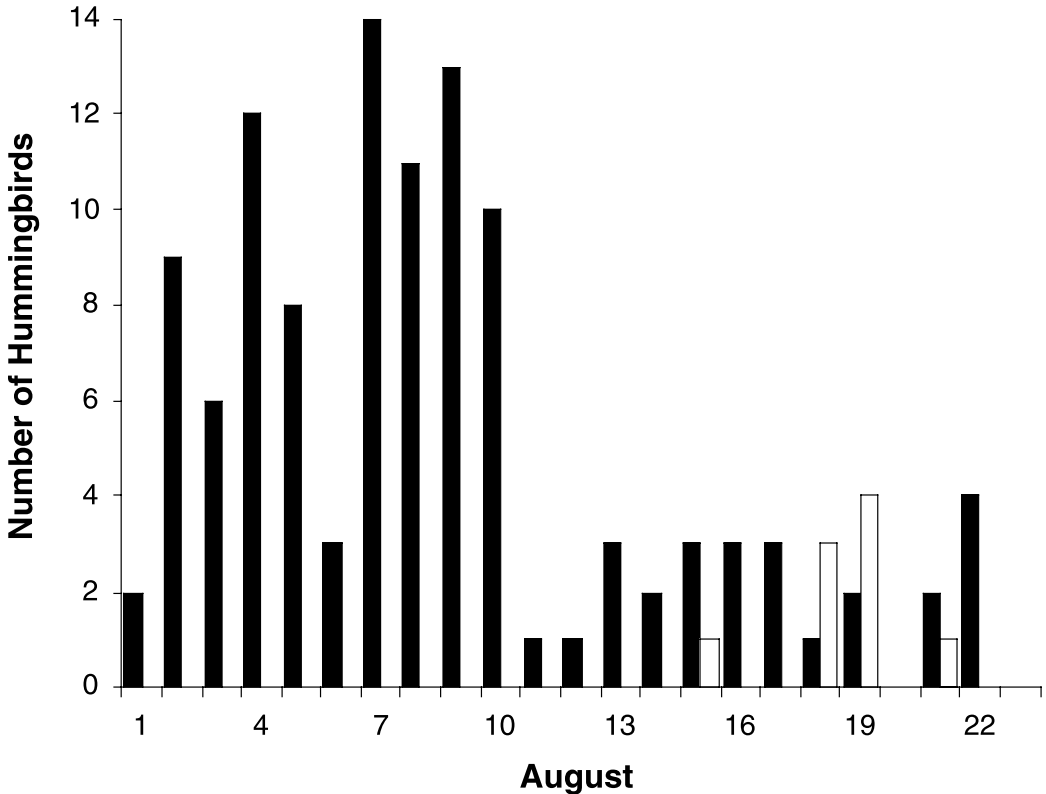


FIGURE 1. Number of Ruby-throated Hummingbirds found caught on burdock at Delta Marsh, August 1985 ( $n = 9$ ), in relation to the number of hummingbirds banded per day throughout 1977 ( $n = 7$ ), 1978 ( $n = 37$ ) and 1979 ( $n = 4$ ), 1981 ( $n = 23$ ) and 1982 ( $n = 42$ ).

that hit seed heads during the chase. Although they became stuck, they extricated themselves within seconds of impact. This observation notwithstanding, accidental strikes on burdock seed heads likely account for few mortalities. This may explain the infrequency of entanglements among the resident songbirds, which have not been observed foraging on burdock flowers or arthropods attracted to them.

It is commonly assumed that birds become entangled while foraging (McNicholl 1988). Although hummingbirds feed mainly while hovering (Robinson et al. 1996), their small size may be the reason they frequently become entangled. As noted by Nealen and Nealen (2000), Ruby-throated Hummingbirds prefer reddish flowers (Robinson et al. 1996; but see Miller and Miller 1971), although they do not specialize on a particular species (Bertin 1982). Because burdock flowers are within the red spectrum (Gross et al. 1980), hummingbirds may be attracted to them in the ridge forest where there are few of the hummingbird's putatively preferred species (Robinson et al. 1996; Shay 1999).

Birds may also become entangled while foraging for insects that inhabit the flowers or the seed heads. Insects may comprise up to 60% of the diet of Ruby-

throated Hummingbirds and individuals have been known to glean larval lepidoptera and other insects from the surface of plants (Robinson et al. 1996). Over 20 species of insects from three Orders, Lepidoptera, Coleoptera and Hymenoptera, have been found on burdock seed heads (Mulligan and Kevan 1973; Gross et al. 1980). The kinglets and warblers may have been attempting to take insects from the burrs when they became entangled (see Needham 1909).

Entanglements may also result from social interactions between individuals. The deaths of two male hummingbirds on the same burr cluster (Table 1, MM 4987A and B) may have resulted when one individual attacked the other at the flower cluster and they both became entangled as the interaction ensued. Sealy watched a male Ruby-throated Hummingbird attack another male as it hovered by a seed head. The hovering bird became entangled by one leg, but extricated itself within seconds. The attacker had already flown away. Wind may also cause entanglements, buffeting birds against seed heads as they move through the area (McNicholl 1988). Thus, identifying the factor or combination of factors that promote individual bird entanglements is difficult.



FIGURE 2. Ruby-throated Hummingbird entangled in burdock found 14 September 2002, Delta Marsh (photograph by T. J. Underwood).

The large number of hummingbird entanglements in burdock over a short period in August 1985 seems unusual. Burdock apparently has increased in abundance on the ridge forest (Kenkel and Graham 1994) since our studies began at Delta in 1973. This suggests that the frequency of entanglement should have increased or at least remained constant. However, search effort has varied widely since 1985 and migration rates and weather patterns affecting bird movements through the ridge forest vary from year to year. Hence, it is difficult to assess from occasional records the overall effect of burdock at Delta Marsh on migrating birds. Nevertheless, the growing number of reports of burdock-related deaths in birds (e.g., McNicholl 1994; Raloff 1998; Underwood and Underwood 2001) suggests that this type of mortality may be more important than originally believed, particularly at places like Delta Marsh, and King's Park in Winnipeg (Underwood and Underwood 2001), where burdock and large numbers of migrating birds are concentrated. Further study of the interaction between birds and burdock and the possibly fatal consequences for birds should result in a better understanding of the effects of this exotic plant species on bird populations.

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