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## Avian Use of Rice-Baited Trays Attached to Cages with Live Decoy Blackbirds in Central North Dakota: Research Update

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### Introduction

For decades, blackbird depredation of sunflower has been a problem. Sunflower growers consistently place blackbirds in the top tier of problems associated with growing sunflower in the northern Great Plains. Many non-lethal tactics have been employed in an attempt to protect ripening sunflower from foraging flocks of blackbirds. Thinning cattail-choked wetlands to reduce roosting habitat, using pyrotechniques to frighten feeding birds, planting Wildlife Conservation Sunflower Plots to lure birds away from commercial plots, applying taste repellents, and adapting cultural methods such as block planting to synchronize ripening are just a few such tactics. Even so, the numbers of blackbirds migrating through the northern Great Plains can overwhelm non-lethal techniques. That is, in some circumstances there are too many blackbirds for non-lethal techniques to be effective.

One avicide, DRC-1339, is registered for use as a lethal bait in the U.S. and North Dakota. The avicide is usually mixed with brown rice at a ratio of 1:25 (treated rice kernel to untreated rice kernels). Normally, the rice mixture is broadcast on the ground in the ripening or sprouting crop. Non-blackbirds are plentiful in ripening sunflower fields, causing a potential risk to these species with the use of DRC-1339. These granivorous non-blackbirds might eat treated rice, causing an unintentional loss. A number of species of songbirds and sparrows could be at risk. Also, ring-necked pheasants (*Phasianus colchicus*) and mourning doves (*Zenaida macroura*) are species of high concern. One potential method of avoiding non-blackbirds is to put live decoys (blackbirds) in cages in areas devoid of habitat to attract free-living blackbirds to bait trays attached to the top of the decoy cages. The intent is to reduce large concentrations of blackbirds that cannot be otherwise dispersed by non-lethal means. The objective of this study is to identify and quantify the avian species visiting the bait trays. Our goal is to develop an effective and environmentally-safe method for managing locally abundant blackbird populations.

### Methods

Based on historical knowledge of sunflower planting patterns, crop phenology blackbird damage to sunflower in North Dakota, and data from the previous field season, the non-target bird assessment was conducted within a 40 mile radius of Jamestown and Wimbledon, ND between 9 August and 18 October 2008. Live decoy blackbirds were placed in decoy trap units fitted with bait trays near gravel roads and blackbird roosts on private land at no more than 12 roost sites and were observed for non-target bird activity. There were 22 total sites (Fig. 1) during the course of the study in the following counties: Barnes (8), Griggs (4), and Stutsman (10).

Modified Australian crow traps (decoy traps), containing captive blackbirds, were placed at least 10 m from the edge of gravel roads on private property. Decoy traps were organized into one of two functional units. The first is a pair of 1.2 x 1.2 x 2 m (6'x4'x4') vertically-positioned traps/cages placed side by side, both function as traps

and holding cages (Fig. 2). The other functional unit was designed once again with two sides, one acting as a trap and the other as a cage. The two portions will be of the same dimensions previously given, but one was oriented in a horizontal fashion such that the maximum vertical height was 1.2 m. The traps/cages were placed in the shape of an “L”, with one trap standing vertical and another cage attached to its base extending horizontally (Fig. 3). The maximum number of birds per unit was set at 20 decoys, with no more than 10 per cage. These units were stationed around roost sites of no less than 5000 blackbirds. When possible, units were placed in proximity to dead trees, which are popular perch sites. In an attempt to discourage non target tray use, vegetation around bait station units was trimmed to a height less than 15 cm (6in), and to a radius of 10 meters from the unit. Again, when possible, units will be placed in tilled fields where vegetation is scant. All tray units were guarded by electrified fencing to deter mammalian predation on decoy birds.

A 0.6 m x 1.2 m (2x4 ft) plywood bait tray was attached to the top of the decoy trap/cage. In the previous field season, experimental welded wire enclosures for large non-target species were tested. During previous research, no such birds were observed, and therefore, wire enclosures were not implemented. If large non-target birds had been observed during this field season, they would have been implemented, but none were observed and the enclosures proved unnecessary. These bait trays were baited with about ½ cup (90g) of dry brown rice on the trays. In a few instances when blackbird use was high, rice levels were increased to 1 cup (180 g) per tray. The rice quantity was checked daily and weighed to measure bait consumption.

These traps contained captive blackbirds that were initially captured with mist nets. An average of 14.5 red-winged blackbirds (*Agelaius phoeniceus*), common grackles (*Quiscalus quiscula*), and yellow-headed blackbirds (*Xanthocephalus xanthocephalus*) were maintained in the decoy traps. We netted birds at all hours of the day but caught the most birds after sunrise in the morning and during twilight in the evening. Fresh food and water were provided as needed by study participants.

Half of the gravel roads used by blackbirds were randomly selected and had untreated brown rice applied along the edge of the road. These rice strips were about 1 m wide. Rice was spread at a rate of 900 g (5 cups)/50 m along the roadside in close proximity to the tray site. Additional rice was added every 5 days at the same rate. Due to the remote nature of most large roost sites encountered this year, many sites did not have a nearby gravel road, and therefore road use data is limited.

Study participants randomly visited the study sites (decoy traps/bait trays) for 1 hr intervals throughout daylight hours to record numbers, species, and ages (when possible) of blackbirds and non-blackbirds on the gravel roads and bait trays. The behavior of the birds was recorded as perching or feeding. The observer parked the vehicle about 50 m from the decoy trap and immediately estimated the number of blackbirds in various habitats (e.g., sunflower, corn, gravel road, trees) within 0.4 km (0.25 mile). After a 10-min quiet period, 1-min counts were made alternating between the gravel road and bait trays, with 2 minutes between observations. At the end of the 1-hr observation period, the observer again estimated the number of blackbirds within 0.4 km.

Binoculars and spotting scopes were used for observations. If the species of bird could not be determined, then identification was made to the closest known taxonomic

group such as genus or family. These data, along with date, time, and weather conditions, were recorded on data sheets printed on rain-resistant paper.

## Results

We observed the bait stations for 471 h between 3 September and 18 October, with 188 h of observation in the Jamestown Area in Stutsman County, 283 h in the Wimbledon area including Barnes and Griggs counties. Of the original 22 sites, 20 had blackbirds present. Of those 20 sites, 4 had only blackbirds present. The remaining 16 sites had both target and non-target birds. Of those 16 sites the non-targets were non-granivorous species at 4 sites. The remaining 12 sites had occurrences of granivorous non-target species. There were only two sites that were not visited by targets or non-targets.

There were 2925 recorded individual visits to trays by 20 different species, and a few birds only identified to family (Table 1). Of these visits, 2860 were individual blackbird visits to trays: 2160 red-winged blackbirds, 111 yellow-headed blackbirds, 250 European starlings (*Sturnus vulgaris*), 1 brown-headed cowbird (*Molothrus ater*), 2 brewer's blackbirds, and 336 common grackles. Blackbirds accounted for 98% of all tray visits (Fig. 5). Peak activity for target species occurred between 20 September and 18 October, with a peak of 24.5 birds per hour of observation (Fig.4). There was an extreme peak on September 4, from one observation at site 4 in Stutsman County that was entirely common grackle, and was a single occurrence outside of normal activity at that time; therefore that peak is not considered the actual peak of activity. There were 65 recorded non-blackbird visits to trays. Raptor species were the most prevalent of visitors with 33 observations, Cooper's hawks (*Accipiter cooperii*) being the most prevalent at 20 observations. Sharp-shinned hawk (*Accipiter striatus*), northern harrier (*Circus cyaneus*) and Merlin (*Falco columbarius*) were also observed along with a few unidentified hawks. These raptor species accounted for 51% of all non-target observations. A variety of other non-granivorous birds were observed including, barn swallow (*Hirundo rustica*), northern flicker (*Colaptes auratus*) and yellow-rumped warbler (*Dendroica coronata*). Of the granivorous species observed, sparrows were most prevalent, including Harris' sparrow (*Zonotrichia querula*), clay-colored sparrow (*Spizella pallida*), American tree sparrow (*Spizella arborea*), savannah sparrow (*Passerculus sandwichensis*), chipping sparrow and unidentified sparrows accounting for 28 % of the non-blackbirds. Peak activity for non-targets, occurred between 17 September and 6 October, but more specifically the peak for non target granivorous species occurred between 22 September and 8 October. The maximum number of granivorous non-targets observed at tray sites was 0.36 birds per hour of observation (Fig. 4). When targets visited trays, 85.5% of them fed on the rice, whereas only 20% of non-targets ate rice, but that number was greater when looking at granivorous non-targets at 48 % feeding when at the sites (Fig. 6).

## Discussion

The formation of study areas that were more condensed and focused around roost sites was done to increase the amount of use by target species throughout the day. Vegetation around tray sites was trimmed to avoid granivorous non-target occurrences on

bait trays. This was done based on previous observations at sites with little weedy vegetation showing reduced numbers of non-target use.

Proximity to roosts or perch trees once again appeared to be beneficial as was observed in the previous field season. Sites that allow perching provide blackbirds an opportunity to observe the trays, be enticed by decoys, and visit the site. It remained apparent that sites near large cattail roosts should be given priority over those near sunflower fields alone. Large roost sites are likely more feasible than scattered small sites for use of bait trays with DRC-1339.

The occurrence of raptor species around tray sites was again observed during this field season, and in fact seemed to be more prevalent than in the previous season. It is possible that this continued presence of predators reduced site efficiency. These continued visits by raptors also proved to be costly in terms of decoy birds at times, as raptors either captured decoys, or harassed them enough to cause injury. Methods of combating these raptor occurrences have not been explored.

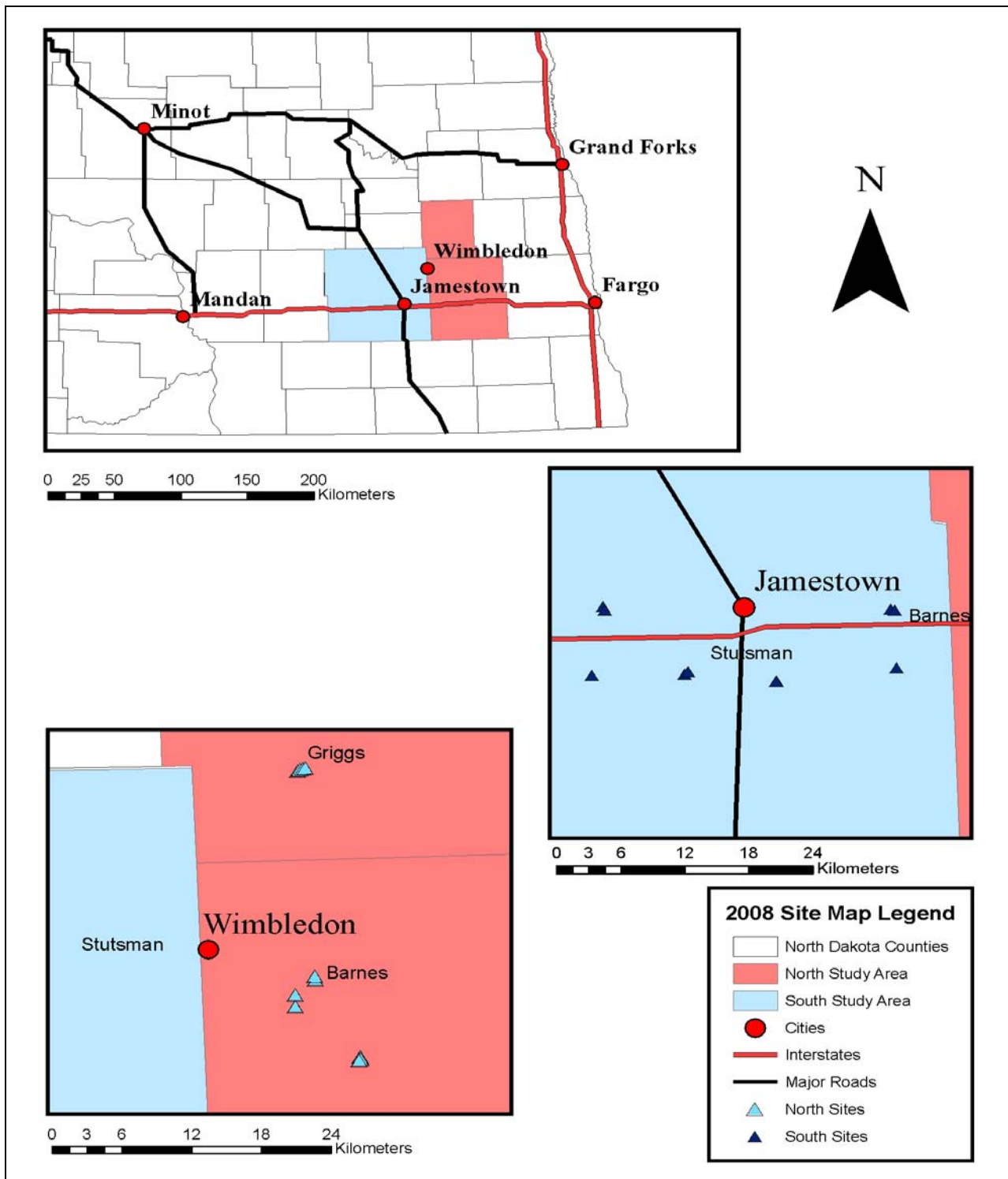
### **Conclusion**

Electric fencing was a key component to success of the project. We were able to maintain consistent and large relatively large numbers of decoys in the traps and cages. Large roost sites were also a contributing factor to success. The use of a capture trap and a holding cage in side by side arrangements proved to be less effective than previously speculated due to small overall numbers of birds captured. Clearing vegetation around trap sites appears to have been beneficial, with fewer numbers of granivorous non-targets observed at tray sites. The use of DRC-1339 baited tray sites may be possible since sites were developed with only blackbirds or target species present and in relatively large quantities. However, the issue will remain to determine the economic feasibility of such a project. Larger cages, with greater numbers of decoys, and larger bait trays could prove to increase feasibility at some large roost sites. After two field seasons of research it appears that DRC-1339 baiting will only be possible in specific instances, where large roosts occur, with substantial perch areas above the trays, and where weedy, or grass vegetation is scarce or removed, such as tilled fields or hayed ground. Under these circumstances it may be possible to manage enough blackbirds to offset the cost of implementing the project and the amount of damage actually being done by the predating birds.

**Table 1.** Numbers of avian species present on rice-baited trays placed near wetland blackbird roosts in central North Dakota from 3 September to 18 October 2008.

Common Name	Scientific Name	Quantity
American robin	<i>(Turdus migratorius)</i>	2
American tree sparrow	<i>(Spizella arborea)</i>	2
Barn swallow	<i>(Hirundo rustica)</i>	2
Brewer's blackbird	<i>(Euphagus cyanocephalus)</i>	2
Brown-headed cowbird	<i>(Molothrus ater)</i>	1
Chipping sparrow	<i>(Spizzella passerina)</i>	1
Clay-colored sparrow	<i>(Spizella pallida)</i>	1
Common grackle	<i>(Quiscalus quiscula)</i>	336
Cooper's hawk	<i>(Accipiter cooperii)</i>	20
European starling	<i>(Sturnus vulgaris)</i>	250
Harris' sparrow	<i>(Zonotrichia querula)</i>	5
Hawks	<i>(Accipitridae)</i>	9
House sparrow	<i>(Passer domesticus)</i>	1
Merlin	<i>(Falco columbarius)</i>	1
Northern flicker	<i>(Colaptes auratus)</i>	3
Northern harrier	<i>(Circus cyaneus)</i>	1
Red-winged blackbird	<i>(Agelaius phoeniceus)</i>	2160
Savannah sparrow	<i>(Passerculus sandwichensis)</i>	1
Sharp-shinned hawk	<i>(Accipiter striatus)</i>	2
Sparrow family	<i>(Emberizidae)</i>	7
Unknown	Unknown	3
Western meadowlark	<i>(Sturnella neglecta)</i>	1
Yellow-headed blackbird	<i>(Xanthocephalus xanthocephalus)</i>	111
Yellow-rumped warbler	<i>(Dendroica coronata)</i>	3

**Figure 1.** From 3 September to 18 October 2008, rice-baited trays were placed in the Jamestown and Wimbledon areas in North Dakota.



**Figure 2.** Vertical pair formation of decoy traps with attached bait trays.

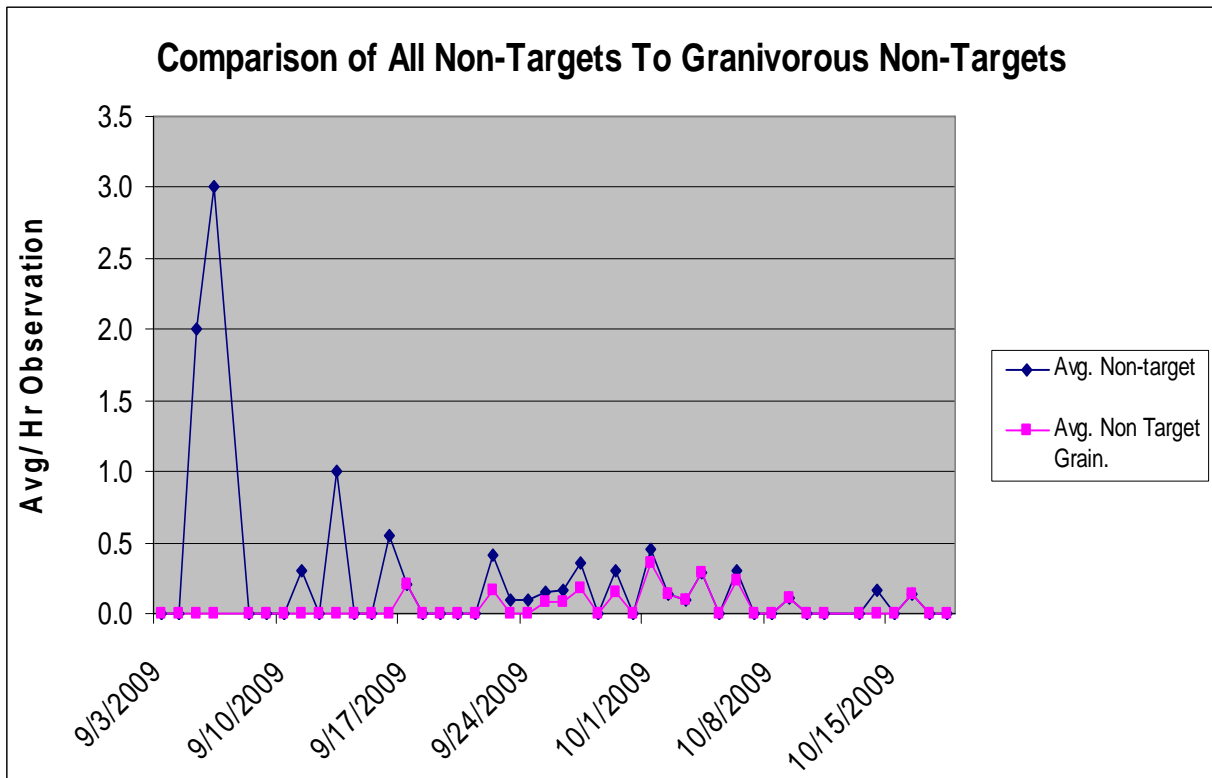
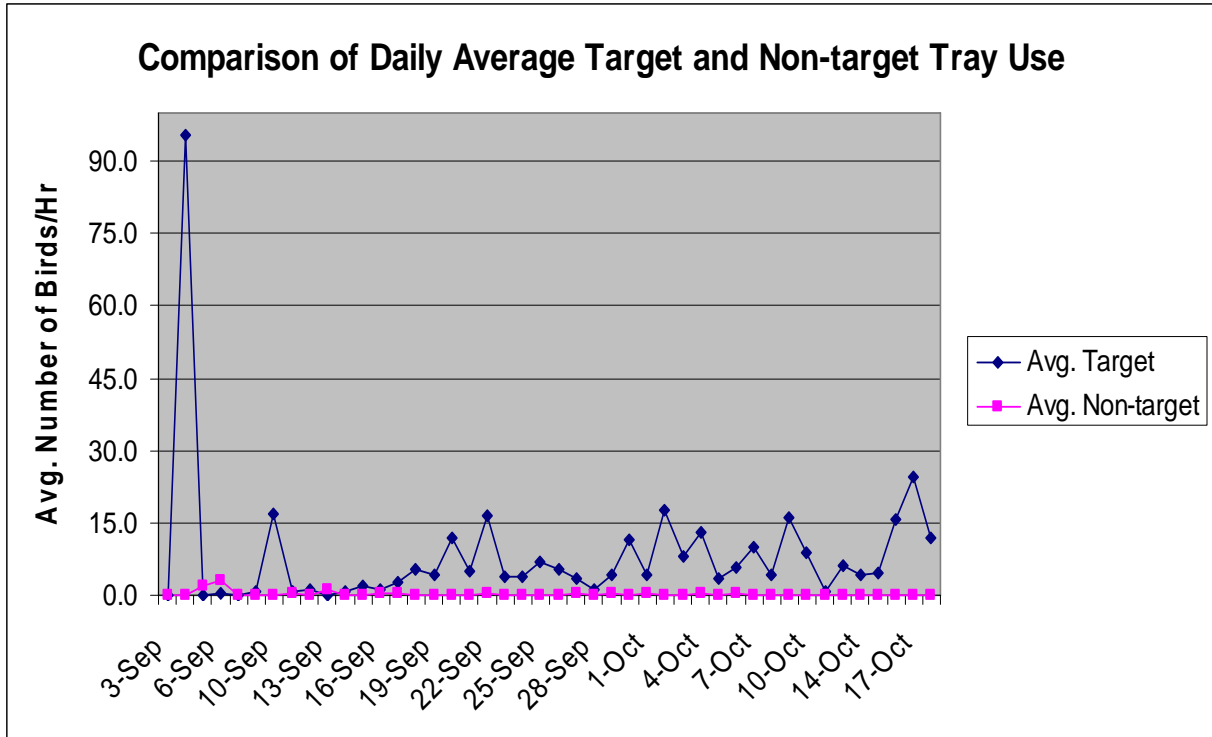




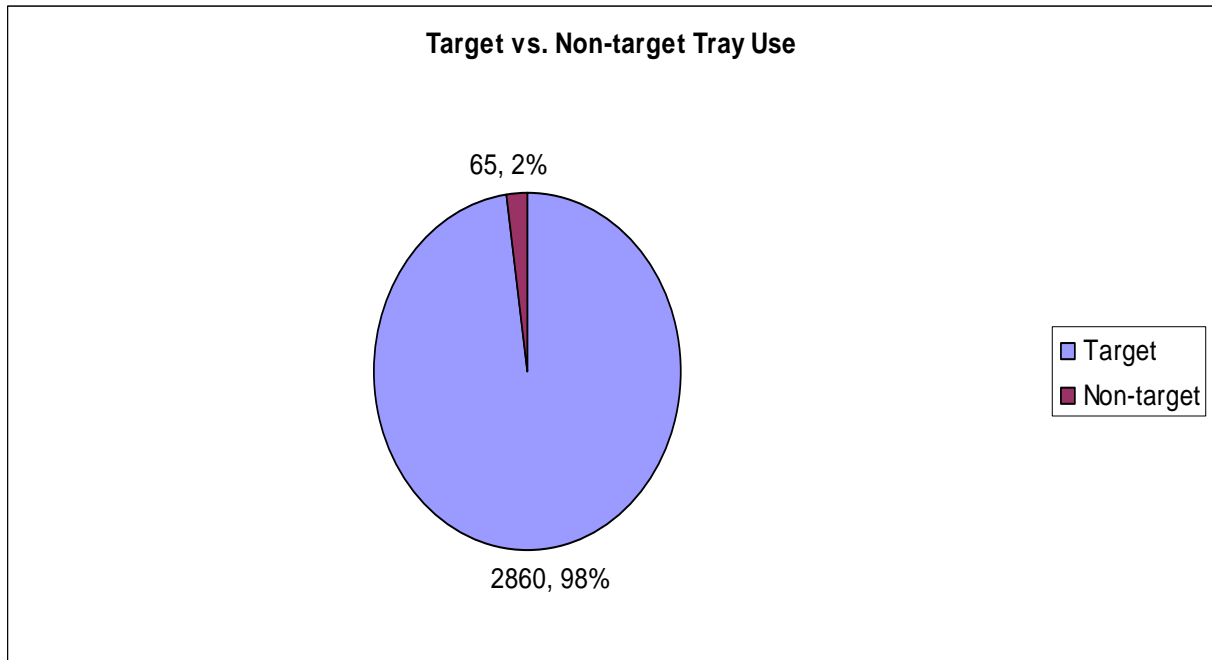
**Figure 3.** Horizontal “L” formation of decoy traps with attached bait trays.



**Figure 4.** Comparison of peak target and non-target activity at rice-baited tray sites in central North Dakota between 3 September and 18 October 2008. Non-targets are specifically broken down in the second portion of the figure into granivorous and non-granivorous.



**Figure 5.** Comparison of blackbird visits and non-blackbird visits to rice-baited trays in central North Dakota between 3 September and 18 October 2008.



**Figure 6.** Comparison of target and non-target activities at rice-baited tray sites in central North Dakota between 3 September and 18 October 2008. Non-targets broken down further into granivorous non-targets.

