

Summary Update on 2014 Eastern Loggerhead Shrike Recovery Program in Ontario

*Prepared by Hazel Wheeler, Species Recovery Biologist, WPC
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Highlights from the 2014 field season

Wild population

16 wild pairs (9 in Carden, 6 in Napanee, 1 in Smiths Falls)
35 wild young fledged
0 wild young recruited for captive population
11 unmated single birds, all in Carden

Captive population

26 pairs in Ontario, and 7 repairing attempts
21 pairs fledged young
110 fledglings produced
8 fledglings died (as of Sept 26)
11 fledglings retained (as of Sept 26); 2 as Toronto Zoo education birds
91 fledglings released; 44 with geolocators, 8 with radio tags

Status of the captive breeding population in Ontario (as of Sept 26)

70 birds in captivity
55 breeding adults, including 4 destined for Front Royal
9 retained young
3 retired birds; 2 for display, 1 to be euthanized
3 education birds (1 SY bird at Mountsberg, 2 HY birds at Toronto Zoo)

Wild Population

Monitoring

Only **16 pairs were sighted in Ontario** this season: 9 in Carden, 6 in Napanee, and 1 in Smiths Falls. This is a significant decrease from last year (22 pairs) and the smallest the population has been since monitoring efforts began in 1991, which is of great concern. Only 14 pairs successfully fledged young (2 unsuccessful pairs in Carden). Productivity was very low again this year, with only 35 fledglings confirmed in Ontario: 20 fledglings in Carden (though one was suspected predated), 13 in Napanee, and 2 in Smiths Falls. However, reproductive success by pair was better this year (88%) than in 2013 (58%). No pairs double-clutched this year, though there were two attempts in Carden that both ended in nest failure. There were five failed nests confirmed this year, all in Carden, between four pairs. Unhatched eggs were collected from one of these nests, and will be stored for potential future testing.

In addition to breeding pairs, there were 11 unpaired birds confirmed this year, all in Carden. The majority of these birds appeared to be males holding territories (territorial singing observed), which raised the question of why there seemed to be such a lack of available females. In one case, a female moved territories, switching mates after two nest failures; the new male had been solitary and holding a territory nearby for over one month. This is the first year that there appeared to be such a sex discrepancy in individuals in Carden.

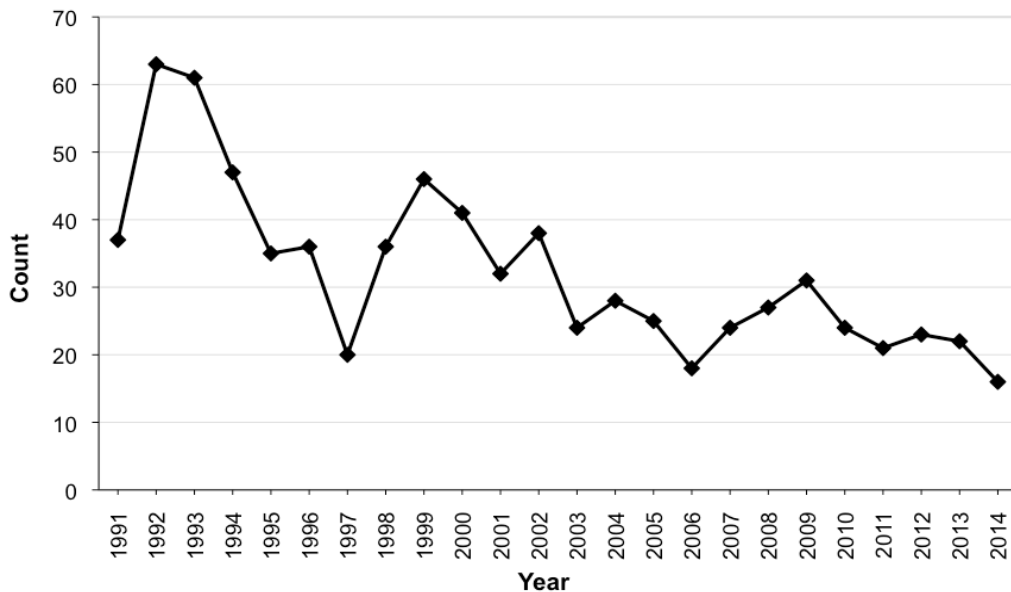


Figure 1: Total number of ELOSH pairs in Ontario 1991-2014

Call-playback was used during most surveys, in accordance with field protocols. An additional experimental protocol was used this year to test the effectiveness of this method to detect shrikes in different stages of breeding, or otherwise holding a territory. Data remains to be compiled, and compared to past years to determine overall effectiveness.

Survey efforts were greatly aided by Adopt-A-Site volunteers. Forty volunteers covered almost 200 priority habitat patches across the core areas, and were responsible for the vast majority of coverage outside of the Carden and Napanee cores. Volunteers completed a checklist for a subset of easily identifiable grassland bird species of interest, with the option given to survey for a few sparrow species; staff also completed this checklist during the majority of their surveys.

Patch assignment again placed volunteers in higher quality areas than in past: in Carden and Napanee they were assigned historic breeding sites and adjacent good habitat, while outside of these cores, where there was minimal staff coverage, volunteers were given high priority sites in areas where sightings have occurred in recent years. This practice has proven useful for the past two years, as volunteers have located shrikes in Grey-Bruce (2013) and Smiths Falls (2014). Consideration was again given to providing sound files to volunteers for call-playback, but this was not implemented this season.

Returning captive birds

Four captive-released birds were confirmed returning to Ontario breeding grounds: three 2012-release birds (one hatched at the Toronto Zoo and hacked in Napanee, one hatched at African Lion Safari and hacked in Napanee, and one hatched and released in Carden); and one 2013-release in Carden (hatched at Mountsberg and hacked in Napanee). The 2013 bird, which was carrying a geolocator, successfully bred with a wild bird in Carden, and was trapped after the young had fledged so staff could retrieve the tag. One other bird successfully bred with a wild bird in Napanee. The remaining birds were singles, one of which was seen at the Carden field site throughout the season, and was often seen trying to interact with the captive birds.

In gauging the success of the hacking program in Napanee, started in 2012, we have now had eight birds return (7 released in 2012, 1 in 2013). This represents a 23% return rate for 2012-release birds (N=31), a 3% return rate for 2013-released birds (N=35), or a 12% return rate for all birds released over the past two years (N=66). These are markedly high numbers; prior to the implementation of the hacking program in Napanee, the highest annual return rate was in 2007, when 6.4% of birds released in 2006 returned to Ontario the following year. The program-wide return rate for all field-bred birds (releases from 2004-2011; N=585) was 5%. This shows great promise for the program, as field-breeding will be entirely replaced with hacking in 2015.

Sighting reports

We received several reports of ELOSH through the southeastern US over the winter of 2013-14, but all were unbanded, so origin is unknown. No banded birds have yet been reported since the beginning of migration in 2014.

Mortality

There were five confirmed nest failures this year, all in Carden, between four pairs. The causes of nest failures were deemed: avian predation (2), mammalian predation (1), inclement weather/high winds (1). The final nest was on a site that staff could not access, so the cause remains unknown.

It is likely that there were further nest failures in Napanee, but difficulties in locating nest trees resulted in less detailed monitoring records for pairs in that core.

Egg collection

Five cracked eggs were collected from the ground under a failed nest in May. It is thought that high winds caused the eggs to be thrown from the nest, which was built in a White Cedar tree (uncharacteristic for Carden birds).

Banding, nest checks, and nest cameras

Amy Chabot trained Jessica Steiner and Hazel Wheeler in trapping and banding wild birds this season. Effort continues to be made to trap all wild adults in order to determine individual identification, band newcomers, and bring all birds up to a 4-colour combo. All wild adults banded this year received DG/SI on the right as part of their 4-colour combination, to denote year of banding; we continue to use the double-overlap colour bands.

Five adults were trapped and banded in Carden, including a 2013 captive-release bird carrying a geolocator. Whereas the wild birds received DG/SI on the right leg as part of their band combination, the geolocator bird retained RD/SI on left as part of its combination. No trapping occurred in Napanee.

Nest checks continued in 2014 and were performed by Hazel Wheeler and Area Biologists.

Small time-lapse cameras were deployed by Hazel Wheeler at 3 sites in Carden; no cameras were deployed in Napanee due to difficulties in locating nests. All of the nests with cameras successfully fledged young, though predation was suspected at three other nests (2 avian predation, 1 mammalian). Unfortunately the predated nests were not monitored with cameras, due to habitat limitations (lack of suitable structures on which to mount cameras), and a lack of property access. Free-standing predator camera stands were constructed in July, which will negate the need for natural mounting structures in coming years. Despite not capturing any predation events, photos will be reviewed over the winter to identify potential predators that occur in the vicinity of the shrike nests.

Critical Habitat

At the beginning of 2014, WPC was approached regarding an OMNR overall-benefit permit that had been issued to Samsung for a large solar farm north of Napanee that would impact two shrike habitat patches. Both habitat patches meet both the provincial and federal criteria for critical habitat, as they had both hosted numerous nests over the past 10 years, the most recent within the past 5 years. The OMNR had drafted the overall-benefit permit with a provision that Samsung needed to mitigate the effect on critical habitat by releasing 40 shrike over 10 years; these figures were developed without any consultation with WPC. Elaine Williams held a number of meetings with Samsung executives to negotiate what sort of funding structure would be necessary to fulfil this condition of shrike releases. A final proposal was submitted to Samsung indicating it would cost \$316,000 to release 40 captive birds; this based on allocating a fair proportional share of the fixed costs associating with maintaining the captive population over 5 years. The permit was issued to Samsung in April which gave them the option of either releasing shrikes or of protecting more shrike habitat. As Samsung has not approached WPC for further discussions, it is assumed they have decided to go with the option of securing additional shrike habitat.

Captive Population Management

The Future of the Captive Population

With the closure of Ingersoll this summer, there was a need to secure additional partners in order to have adequate wintering space for the current captive population as well as future growth. Little Ray's Reptile and Wildlife Zoo (near Ottawa) and the Bowmanville Zoo were secured as new partners, with an agreement to overwinter birds (10 at Little Ray's, 8 at Bowmanville) and

erect breeding enclosures for next season to accommodate up to 8 breeding pairs between them. Little Ray's completed their wintering pens, using materials from Ingersoll, at the end of August, and is currently holding birds; Bowmanville will receive their birds this fall (see below for details). African Lion Safari is also building a new facility that will house an additional 8 birds, to be ready by Thanksgiving; this space will be used to house any birds in indoor-only enclosures at the Toronto Zoo, allowing us to winter all birds with outdoor access for the first time since the program's inception. All new facilities are inspected by WPC prior to receiving birds.

Riverview Park (Peterborough) has added shrike to their Conservation Strategy, and currently have a 5th year undergraduate student from Trent University's Conservation Biology Internship Program developing a project implementation plan for the shrike program at the zoo. Discussions with Twin Valley Zoo (Brantford) and Safari Niagara will get underway this fall, and it looks promising that all could become additional partners in 2015.

Conditions for the new Avicultural Permit were developed, reviewed by the Captive Sub-Committee and have been submitted to Ken Tuininga; all facilities will need to apply for this permit in October to cover their activities in 2015. An MOU with WPC has been finalized; all new partners will need to sign this agreement for 2015.

2014 Captive Breeding and Release

Ontario Summary

There were 26 initial pairs this season, and an additional 7 re-pairing attempts, for a total of 33 pairings. **Twenty-one of these pairs produced 110 young this season** (Figure 2). **Ninety-one young were released to the wild** (34 in Carden, 57 in Napanee); two of the birds released in Napanee were confirmed predated post-release. Predation notwithstanding, the number of young released this year is a marked increase from last season, and the most birds released since 2009. **Nine young were retained** for the captive population; while the program was constrained by available overwintering space, we were able to retain young from all but one high priority pair that successfully bred. An additional two young were hand-raised by the Toronto Zoo for education purposes, so are not considered breeding stock. There were **8 fledgling deaths** this season (details in Mortality section below), which is a notably low level of mortality compared to recent years.

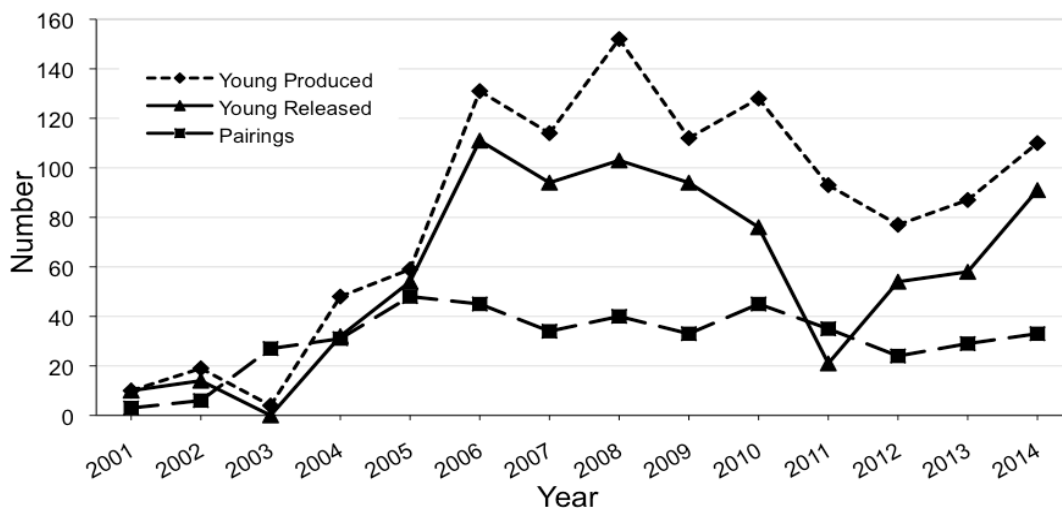


Figure 2: ELOSH captive pairings, young produced and young released 2001-2014

Captive Breeding Results and Wintering Status by Site

Carden: 5 of 7 pairings at the site fledged 29 young (18 from 1st clutches, 11 from 2nd clutches). 24 were released, 18 wearing geolocators, and 2 wearing radio tags. Three high-priority young were retained. Two fledglings died prior to release; one was found dead in the release cage, and the other died after being transferred to the Toronto Zoo for treatment.

Mountsberg Raptor Centre: 5 of 7 pairings fledged 29 young (19 from 1st clutches, 10 from 2nd clutches). 25 were released (21 in Napanee, 4 in Carden), 17 with geolocators and 3 with a radio tags. Four high-priority young were retained for the captive population. This facility is currently wintering 12 birds, including 4 retained young; an additional captive bird is being held for education purposes.

Toronto Zoo: 7 of 12 pairings fledged 29 young (26 from 1st clutches, including 2 birds hand-reared for education; 3 from 2nd clutches). Successful breeding occurred within the Barn this year, with all three pairs fledging young. 25 birds were released (19 in Napanee, 6 in Carden), 4 with geolocators and 3 with radio tags. Two high-priority young were retained for the captive population, and two low-priority young were hand-reared for education purposes. Since the Wildlife Health Centre took over shrike care at the Zoo, the productivity and survivorship at this facility has improved drastically. This facility is slated to hold 24 birds over the winter, including 7 retained young, but is currently holding an additional 2 that will be put on display at Little Ray's, and 4 others to be transferred to the facility in Front Royal, VA this fall.

African Lion Safari: 4 of 7 pairings fledged 23 young (15 from 1st clutches, 8 from 2nd clutches). 17 birds were released in Napanee, 5 with geolocators. Six fledglings died prior to release (three each in July and August, as detailed below). This facility is slated to hold 9 birds over the winter, but is currently holding an additional 8 birds that will be transferred to the new facility at the Bowmanville Zoo once enclosures are ready (anticipated mid-October). One additional bird was being held with the intention of putting it on display at Bowmanville, but it died in mid-September. Safari is also in the process of building a new facility that will have capacity for 8 birds, both for breeding and overwintering. Once this building is complete (also anticipated end of October), some birds will likely be transferred here from the smaller indoor enclosures at the Toronto Zoo.

Little Ray's Reptile Zoo: This is a new overwintering facility, which received its first 10 birds at the beginning of September. The birds sent to Little Ray's were all surplus males or unpaired/low priority for captive breeding in 2014. Three birds died soon after transfer, but the remaining birds seem to have settled in and health is stable. There are currently 7 birds being held here in overwintering pens, with construction underway for display enclosures for an additional two birds (currently held at the Toronto Zoo).

Bowmanville Zoo: Bowmanville is another new partner facility for the winter of 2014, and will be holding 8 low priority birds for the captive breeding population. Bowmanville had also intended to put a retired bird on display, but that individual died while in holding at African Lion Safari (see above). Facilities are currently under construction, with completion anticipated by the end of October. The 8 birds for this facility are currently being held at African Lion Safari.

Ingersoll: Ingersoll was shut-down at the beginning of the 2014 breeding season, and will no longer be used as an overwintering facility for the program. Indoor pens were salvaged for enclosure construction at Little Ray's and Bowmanville.

Front Royal: 2 of 3 pairings fledged 4 young (3 from 1st clutches; 1 from 2nd). One fledgling died, with snake predation suspected as the cause. The three remaining fledglings were initially going to be transferred to Ontario to be released in Napanee, but ultimately remained at the facility due to difficulties in obtaining transfer permits in a timely manner. Twelve enclosures are going to be renovated over the winter, creating space for six additional breeding pairs in 2015. An additional 4 adult birds will be transferred to this facility in the fall, to create more pairing opportunities for next season (those birds are currently held at the Zoo). This is the first year that birds have successfully bred at this facility.

Status of the Captive Population

As of September 26, there are **70 birds in the Ontario captive population** (this figure includes the 4 birds destined for Front Royal, and 3 hand-reared education birds). There are 55 adults considered breeding stock; 42 are 5 years old or younger (HY 2009-2013), 12 are 6-10 years old (HY 2004-2008) and 1 is 12 years old, and will be retired after next breeding season. Nine captive-reared young are currently maintained at wintering facilities and will supplement the captive population in Ontario. Three other retired birds remain; two will be put on exhibit at new partner facilities, and one will be euthanized this fall because of its advanced age (14 years old).

Mortality

We continued to see reduced mortality this season over recent years, especially during the breeding season. Methods followed those adopted in 2013, including the use of a gut-loader high in vitamin E (Zukudla). Prophylactic treatment largely did not occur around transfers, due to constraints of having to house birds individually for treatment. No new enclosures were erected this season.

WPC staff continue to work closely with veterinarians at the Toronto Zoo and the OVC Pathology Lab to investigate reasons for the mortality the program is experiencing.

Adults: We saw **10 adult deaths** in Ontario this year as of September 26, including 1 old male that was euthanized at African Lion Safari on September 5. Most recently, a retired bird that was being held at ALS for eventual transfer to Bowmanville was found dead. Necropsy results are pending, but this bird was 12 years old, so age was undoubtedly a factor. Three other recent deaths were at Little Ray's Reptile Zoo, shortly after the birds were transferred there for the winter, so stress was likely a major contributor (necropsy results pending). Stress and age were implicated in the death of a 14 year old male that was transferred for holding at the beginning of the breeding season. Three other deaths occurred prior to the breeding season: two remain with cause unknown, and one was due to a head trauma suffered in the overwintering enclosure. There was only one adult death during the breeding season, and final necropsy results are pending. Results and any findings will be detailed in the final report.

Fledglings: Fledgling mortality continued to be low this year, with only **eight young bird deaths (7%)** as of September 26. This is the lowest level of fledgling mortality observed since 2006. The majority of fledgling deaths occurred at African Lion Safari (6 young from 3 enclosures), with the remaining two deaths in one brood at Carden. Only two of these birds (one from Carden, one from ALS), displayed symptoms reminiscent of those seen in high mortality years (weak flying and perching, slight tremor, ataxia). Necropsy results continue to be inconclusive in these cases. Causes could be identified in three of the other deaths: there were two injuries, and one bird had to be euthanized because of a long-bone deformity at ALS. Further results and any findings will be detailed in the final report.

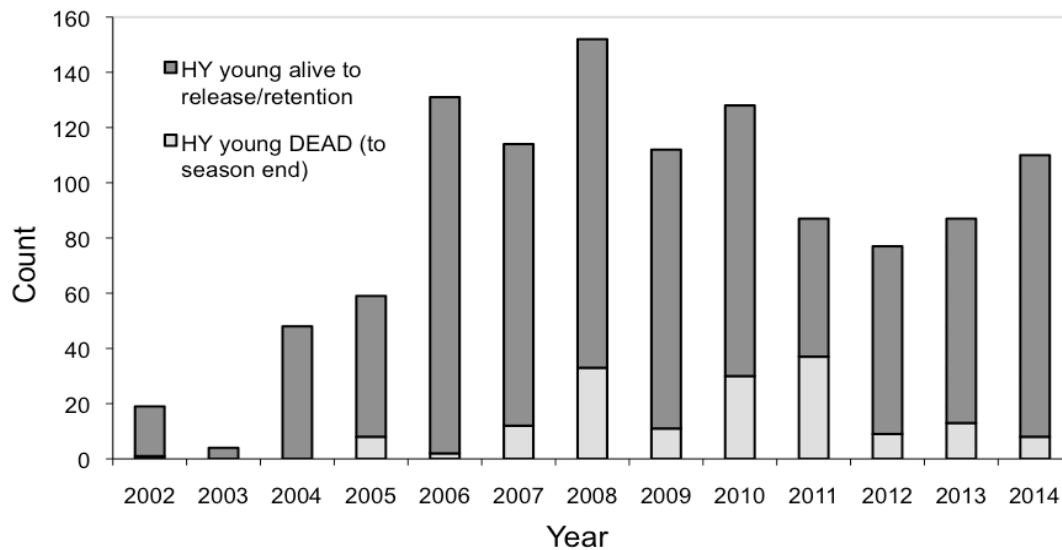


Figure 3: Proportion of fledglings produced each year that died or survived to release/retention

Banding, Colour-Marking, Geolocators and Radio tags

102 captive juvenile shrikes received stainless steel bands this season; 2 captive-reared banded birds later died. Released birds were given combinations which included DG/SI on the left as part of their combo to identify them as a 2014 release bird, UNLESS they were wearing a geocator or radio transmitter. Geocator birds received only RD/SI on left for ease of identification next season, and radiotagged birds received only SI on left because of weight constraints. All birds received some sort of temporary colour-marking (Sharpie) to aid in individual identification while in the release enclosures and during post-release monitoring (Figure 4).

Forty-four birds were released with geolocators this season, using the same Teflon ribbon and attachment technique used in 2013, but using a gold-plated crimp bead in place of a knot to secure the harness (Figure 5). An additional five tags were removed at pre-release checks due to abrasion, and one fell off while the bird was still in captivity.

Coded VHF radio tags were also deployed on captive-reared birds this season, and will be tracked using the antenna tower network that has been built throughout southern Ontario by Bird Studies Canada and partners, with plans to extend in to the eastern US. Because the battery-life on the tags is only ~5 months, and we do not want individuals to retain the tags indefinitely, the harness was made of nylon-coated elastic cord and secured with a knot (Figure 6)– this has shown good retention on young pre-release, and has been used successfully by Georgia DNR for shrike telemetry research. Eight birds were released with coded VHF radio tags, all banded with only stainless steel on the left leg, due to weight restrictions. Two tags had to be removed at pre-release checks due to abrasion, and they have been deactivated and stored in a refrigerator, for potential deployment next season. Data from the antenna tower network will be relayed to us through Bird Studies Canada once their staff download and process the data.



Figure 4. Colour-marked captive-bred birds observed during post-release monitoring.

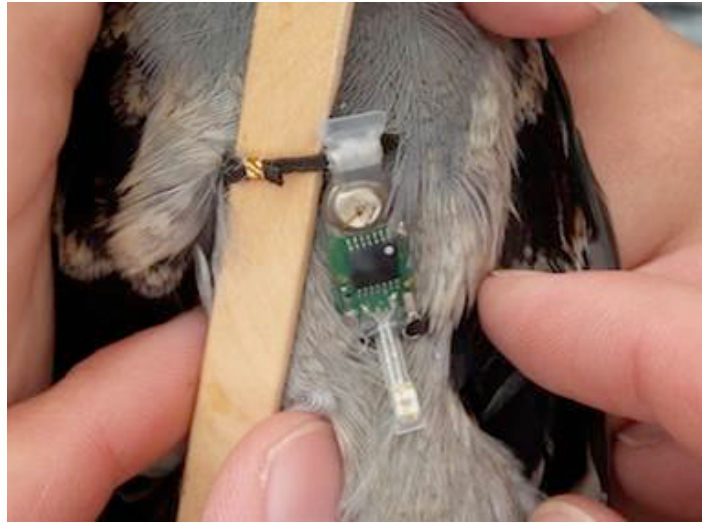


Figure 5. Geolocator on a captive-bred shrike, with a crimp bead used to secure the Teflon harness

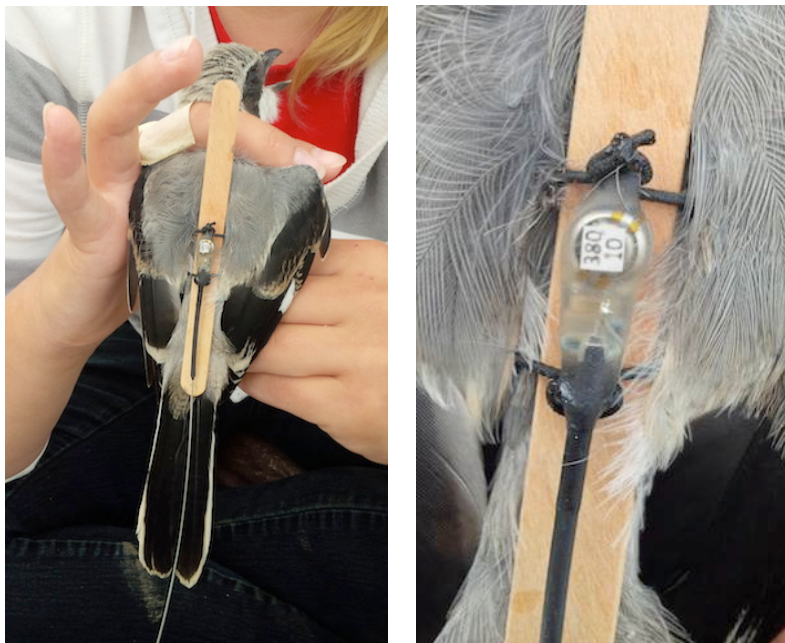


Figure 6. Radio tag attachment on a captive-bred shrike

Outreach and Landowner Appreciation

Public Presentations and Site Tours

SRB and volunteer Chana Steinberg represented WPC at Migratory Bird Day at the Toronto Zoo on May 10. A display board was mounted and outreach materials were made available to visitors. Approximately 50 people were reached through this event.

SRB represented WPC at the Spring Bird Festival at Colonel Sam Smith Park in Toronto on May 24. There was much interested in shrike and pollinators, and a constant stream of people visited the display.

WPC had a display booth at the Carden Nature Festival on Jun 7-8. A tour of the Carden field-breeding site was conducted on Jun 7, with 10 people in attendance.

Landowner Appreciation Dinners

Landowner and Volunteer ELOSH Appreciation Dinners were held in Carden on August 21 (~60 attendees), and Napanee on August 26 (~65 attendees). Tours of the field breeding site in Carden (10 attendees) and the Napanee release site (3 attendees) were given prior to the dinners. At both dinners, staff shared season's results over a powerpoint slideshow of pictures from the season, and outreach materials were made available. Feedback was very positive.

Habitat Stewardship Program

Over August, Area Biologists met with interested landowners to discuss potential stewardship projects for this fall/winter. Five projects have been identified in Carden (2 fencing, 3 water systems), including the replacement of two water systems that were stolen over the winter of 2013/14. Carden projects will be further developed and completion coordinated by Couchiching Conservancy staff. Four projects have been identified in Napanee (3 fencing, 1 water system) and will continue to be developed by the area biologist through the fall.

Fundraising 2014/15

Secured

- HSP \$75K
- EC G&C \$100K
- OSAR-SF \$60,455

Unsuccessful

- Baillie Fund \$5K to launch a long-term citizen-science monitoring project for grassland birds
- Liber Ero Fellowship Program (Amy Chabot post-doc research), \$130K.
- Science Horizons \$12K

Winter 2014/15 activities

Stress hormone research

No further feather samples were taken in 2014. Samples from 2013 continue to be processed by Gariela Mastromonaco (Toronto Zoo), and results are currently being analyzed by Thom Luloff (Fleming College). Updates and details on results are pending.

PVA

Much effort, led by Amy Chaot, has gone into data proofing the shrike Access database in preparation for re-running the PVA. It is anticipated this analysis will occur prior to year-end.

SNPs

SNP “discovery” phase has finally been completed and they now need to be validated. Based on recent advances in technology and further discussion with Genome Quebec, validation will include shotgun DNA library construction and bioinformatics; this approach will provide additional data on the shrike nuclear DNA genome. This work is already paid for through a 2011/12 SARRFO Grant.

Other research

A project proposal for an Industrial NSERC was submitted in June by Amy Chabot and African Lion Safari. The goal of the research is to develop ecogenomic tools for Loggerhead Shrike, specifically: 1) develop genetic markers for the Major Histocompatibility Complex in the Loggerhead Shrike (associated with immune function); 2) quantify the effect of captivity and managed breeding on the genetic diversity of the MHC in shrike; 3) determine range limits of the DU comprising shrikes found in Ontario; 4) determine the suitability of Ontario captive stock for captive breeding efforts in the northeastern United States; and 5) make recommendations to improve management of the shrike captive-breeding program in Ontario and in eastern North America. No news yet on whether the application was successful.

U.S. Partnership Development

Amy Chabot has been working with Jessica Steiner, Rich Bailey (Virginia state ornithologist) and Sergio Harding (West Virginia state ornithologist) in furthering the development and implementation of a North American Loggerhead Shrike research and recovery strategy, as a means to address knowledge gaps for ELOSH outside of Ontario and address individual state priorities. Draft 5-year and 2-year strategic plans have been compiled and circulated. A North American Loggerhead Shrike Workshop has been organized as a side meeting at the annual Partner’s in Flight meeting (Oct 6-9, 2014), hosted jointly by the Southeast and Northeastern Regions. Draft banding and survey manuals, based on ELOSH protocols, have been prepared and will serve as the basis for discussion of methodology. Representation at the meeting includes partners from Virginia, West Virginia, Indiana, Tennessee, North Carolina, Georgia, Arkansas, Maryland, Kentucky, and Louisiana. Illinois state, federal and NGO partners remain committed to on-going shrike work and are seeking funding to continue Amy’s long-term study at Midewin National Tallgrass Prairie. Missouri, Oklahoma and Texas representatives are unable to attend the PIF meeting or workshop, but will participate in future teleconference meetings and would like to initiate work in 2015. New Jersey feels that their population is extirpated but will support work if it is found that shrikes use the state as migratory stop-over or wintering site. Contact work is underway with representatives from New York, Pennsylvania, Ohio, Florida and South Carolina. It is anticipated that an NMBCA grant application will be submitted this year, with the focus being implementation of the 2-year strategic plan, namely initiating survey and banding work on a regional scale. *It remains unclear who will be the lead organization implementing these activities in Ontario beyond 2015*, as WPC’s involvement will become focused exclusively on the captive-breeding and release program, with limited monitoring associated with evaluating those activities. The application would include funding for a coordinator and possibly training in shrike trapping and banding methodology. Currently, it would appear that partners are comfortable with Amy Chabot taking on that role. Biologists from Virginia, West Virginia and Indiana were trained during the spring/summer of 2015. Work in West Virginia was undertaken by the state ornithologist in late-summer and biologists in both Indiana and Virginia hope to continue/expand surveys and undertake banding this winter.