

## **Summary Update on 2015 Eastern Loggerhead Shrike Recovery Program**

*Prepared by Hazel Wheeler, Species Recovery Biologist, WPC  
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### **Highlights from the 2015 field season**

#### ***Wild population***

- 11 wild pairs (7 in Carden, 4 in Napanee)
- 29 wild young fledged
- 0 wild young recruited for captive population
- 13 unmated single birds (9 in Carden, 3 in Napanee, 1 in Grey-Bruce)
- At least 23% of all birds detected in the wild this year were captive-releases.

#### ***Captive population***

- 26 initial pairs, and 4 repairing attempts
- 18 pairs fledged young
- 96 fledglings produced
- 8 fledglings died (as of Nov 2)
- 15 fledglings retained
- 73 fledglings released; 22 with radio tags

#### ***Status of the captive breeding population in Ontario*** (as of Nov 2)

- 79 birds in captivity
- 54 breeding adults
- 15 retained young
- 6 retired birds; all potential for display
- 3 hand-reared education birds (1 TY bird at Mountsberg, 2 SY birds at Toronto Zoo)
- 1 exhibit bird (2004HY female at Little Ray's)

## Wild Population

### Monitoring

Only **11 pairs were confirmed in Ontario** this season: 7 in Carden, and 4 in Napanee. There may have been one other breeding pair in Carden, but it could not be confirmed as it was on a site that was not accessible by staff. This is a critically small population, and the lowest count observed since monitoring efforts began in 1991 (Figure 1). All pairs successfully fledged young this year, which was an increase in reproductive success by pair as compared to last year, when 88% of pairs fledged young. However, despite all nests producing independent young, that amounted to only 29 fledglings confirmed: 17 in Carden, and 12 in Napanee. There was one nest failure in Carden, but that pair re-nested in the same territory and successfully fledged four young. No pairs double-clutched this year.

In addition to breeding pairs, there were 13 unpaired birds confirmed this year: 9 in Carden, 3 in Napanee, and 1 in Grey-Bruce. Only six were banded, allowing definite identification; the rest were unbanded or bands were not visible, so count was determined by timing and location of sightings. The majority of the single birds were somewhat transient, and were not reliably seen.



**Figure 1:** Total number of LOSH pairs in Ontario 1991-2015

Call-playback was used during most surveys, in accordance with field protocols. This was also the second year of use for an experimental protocol 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 analysed to determine overall effectiveness; results will inform the future use of this tool in both staff and volunteer surveys.

Survey efforts were greatly aided by Adopt-A-Site (AAS) volunteers. Forty-three volunteers covered over 350 priority habitat patches across the core areas, and were responsible for the vast majority of coverage outside of the Carden and Napanee cores. Volunteers also completed a checklist for a subset of easily identifiable grassland bird species of interest. Call-playback was incorporated in to the volunteer protocol this year as an optional tool to increase detectability of shrike. Also, the effectiveness of the AAS program at detecting shrike was assessed this year by having volunteers duplicate field staff surveys of sites throughout the core areas, including those sites where shrikes were found in 2014. Historically, highest priority sites were surveyed only

by staff, with volunteers covering outlying areas. There are still some outstanding volunteer data, so analysis will begin once those have been submitted. Cursory results suggest that road-side surveys conducted with the existing AAS protocol may not be effective at locating shrikes, as no volunteers were able to confirm birds known to be on territories in Carden or Napanee. However, call-playback was not employed by all volunteers; universal adoption of this tool could improve the efficacy of the current protocol, and will be further emphasized in future.

### ***Returning captive birds***

Eight captive-released birds were confirmed returning to Ontario breeding grounds: two 2013-release birds in Napanee (both hatched at Mountsberg and hatched in Napanee); and six 2014-release birds in Carden (four hatched in Carden, one hatched at Mountsberg, and one hatched at the Toronto Zoo; all released in Carden). Four of these birds successfully bred with wild birds (three in Carden, one in Napanee), and the other four were single birds.

Four geolocators were recovered from captive-bred birds this year: three released in 2014, and one released in 2013 that had collected data for two years. All of the 2014 tags had to be sent to the manufacturer to recover the data as the batteries had died, so we continue to wait for processing. Data from the first year of the 2013 recapture suggested the bird made a short-distance movement to the south side of Lake Ontario and some lateral movements east and west; unfortunately the resolution of geolocators makes interpretation of these movements difficult, and we are currently waiting to average the sun-elevation value across all retrieved geolocators in order to improve our confidence in our interpretation of results. One of the 2014-releases was part of a breeding pair in Carden, and the rest were single birds.

There may have been two other returning captive birds, though they could not be confirmed. A geocator bird was spotted on one occasion at a site in Carden, but was not seen again, though two other geocator birds were caught at nearby sites in the following weeks; it is likely that the first bird was one of those caught later on. The other bird was one banded with only a metal band on its left leg, which could indicate a captive-bred bird that was released in 2010 or 2011, or a wild bird banded as a nestling in 2010, or a bird that had lost its colour bands.

Using the conservative count of eight returning captive birds, these individuals made up **23% of all Loggerhead Shrike confirmed in Ontario** this year, which emphasizes the importance of the captive breeding and release program in maintaining shrikes on the landscape.

### ***Sighting reports***

We received several reports of LOSH through the southeastern US over the winter of 2014-15, and though two birds were banded with metal bands, none were colour-banded, so origin is ultimately unknown. No banded birds have yet been reported since the onset of migration in 2015.

### ***Mortality***

There was only one observed nest failure this year, but circumstances surrounding the failure are unknown. A pair was found nest-building in a white cedar on April 13 in Carden during early-season surveys, but had built a nest in a nearby hawthorn at the next visit (May 1). No field staff were present in the interim to gather more detailed observations. A similar situation occurred at the same site last year, where a nest was built in the same cedar tree, but was destroyed during a bout of bad weather, so the pair re-nested in a nearby hawthorn. It is unknown whether the first nest this year was complete, and if eggs were present, or if the pair was simply prospecting for nest sites.

### ***Banding, nest checks, and nest cameras***

All trapping and banding this season was performed by Hazel Wheeler, with assistance from area biologists. Returning birds carrying geolocators were the main target for trapping, and effort was put towards trapping unbanded adults as time allowed. We continue to use the double-overlap colour bands, and started melting the exposed end with a small butane spot-welder this year to further improve retention. WH/SI on the right leg was used to denote year of banding for newly caught adults in 2015.

Five adults were trapped and banded this year (four in Carden, one in Napanee), four of which were carrying geolocators (one released in 2013, and three in 2014). The other bird caught was an unbanded single bird that was on a territory in Carden the day following a sighting of a geocator bird. The birds carrying geolocators were already banded with RD/SI on their left leg, so only had two colour bands added to complete their four-colour combination.

Nest checks continued in 2015 and were performed by Hazel Wheeler and area biologists.

Small time-lapse cameras were deployed by Hazel Wheeler at four nest sites: two each in Carden and Napanee. All of the nests with cameras successfully fledged young, and there were no other sites where nest predation was suspected. Despite not capturing any predation events, photos will be saved for potential review in the future to identify potential predators/disturbance that occur in the vicinity of the shrike nests.

### ***Critical Habitat***

Large-scale solar development continues to threaten Loggerhead Shrike critical habitat in the Napanee area. In addition to the Kingston Solar project undertaken by Samsung last year, which will impact two shrike habitat patches that meet both provincial and federal criteria for critical habitat, two other proposals (Loyalist Solar Project, BluEarth Renewables; Centreville Solar Project, Algonquin Solar) will further impact shrike habitat in the Napanee core. The proposed subject area for the Loyalist Project abuts a nest site active this year, and the Centreville project is proposed one concession to the north, approximately 2km from the active site. Both of these projects, which were supported by Stone Mills city council at a meeting on Aug 20/15, will further fragment habitat in this important core area. The importance of this can not be understated, as we continue to lose connectivity between islands of provincially defined critical habitat, which is impacting the overall quality and landscape requirements of the remaining shrike habitat in Ontario.

Solar farm development is also threatening habitat in the Carden area. A letter of support was written for a landowner in the area who was opposing a proposed project near Kirkfield, and the Kawartha Lakes City Council voted against the approval of this solar farm, along with nine others in the municipality, at the end of August. Though the proposed project does not impact provincially-defined critical habitat, it will impact foraging habitat, and contribute to habitat fragmentation.

### ***Captive Population Management***

#### ***Status of the Captive Population***

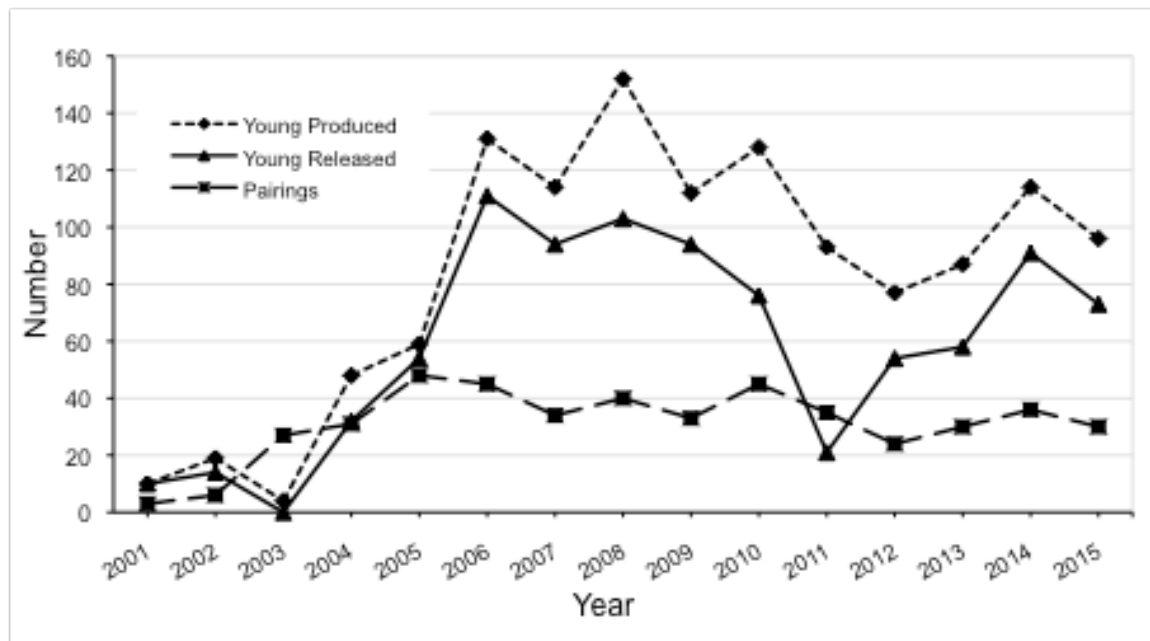
As of November 2, there are **79 birds in the captive population** (including partner facilities in both Canada and the US). There are 54 adults considered breeding stock; 47 are 5 years old or younger (HY 2010-2014), 5 are 6-10 years old (HY 2005-2009) and 2 are over 10 years old. An additional seven birds have been retired, including a 2004HY female that was put on exhibit at LRR last winter. The oldest individual is a 15-year-old female currently held at SCBI. Fifteen captive-reared young are currently maintained at wintering facilities and will supplement the captive population.

## 2015 Captive Breeding and Release

### Summary

There were 26 initial pairs this season, and an additional 4 re-pairing attempts, for a total of 30 pairings.

**Eighteen of these pairs produced 96 young this season (Figure 2). Seventy-three young were released to the wild** (45 in Carden, 28 in Napanee). **Fifteen young were retained** for the captive population: 11 from high priority pairings, 2 from a medium priority pairing comprised of two adults that will be retired from breeding after this year, and 2 that were blind in one eye thus deemed unfit for release. There were **8 fledgling deaths** this season (details in Mortality section below), which maintains an low level of mortality compared to recent years.



**Figure 2:** ELOSH captive pairings, young produced and young released 2001-2015

### Captive Breeding Results and Wintering Status by Site

*Mountsberg Raptor Centre (MRC):* 5 of 8 pairings fledged 34 young (25 from 1<sup>st</sup> clutches, 9 from 2<sup>nd</sup> clutches). Thirty were released (11 in Napanee, 19 in Carden), 7 with radio tags. Four high-priority young were retained for the captive population, though one died at the beginning of September. This facility is currently wintering 12 birds, all adult breeders, and an additional captive bird is being held for education purposes.

*Toronto Zoo (TZ):* 6 of 7 pairings fledged 38 young (28 from 1<sup>st</sup> clutches, 10 from 2<sup>nd</sup> clutches). Thirty birds were released (7 in Napanee, 23 in Carden), 14 with radio tags. Six young were retained for the captive population: four from high priority pairings, and two from a medium priority pairing in which both adults were retired after the 2015 field season. Two fledglings died prior to release, and one adult died when it was accidentally isolated in an unserviced unit (detailed below). This facility will hold 20 birds over the winter, including 6 retained young, and 2 education birds.

*African Lion Safari (ALS):* 4 of 11 pairings fledged 10 young, all from single clutches. Six birds were released (three each in Napanee and Carden), none with radio tags. One bird was retained from a low priority pairing due to an injury that left it blind in one eye, thus unfit for release. One entire clutch of three fledglings died prior to release (as detailed below). Breeding success was very low at this facility this year, with approximately equal success between field enclosures and the new shrike building (built in fall 2014). Three pairings showed no breeding behaviour, and an additional three pairings did lay eggs, one even hatching six nestlings, but eggs were abandoned during incubation, or nestlings disappeared before fledging. A large construction project (natural gas

pipeline) was initiated in the spring approximately 500m southeast of the shrike holding facilities, which may have impacted breeding. Other potential factors contributing to the low success this year will be examined over the winter. This facility will hold 18 birds over the winter, including 5 retained young.

*Smithsonian Conservation Biology Institute (FR):* A 3-year CWS Scientific Permit was issued in the spring to allow birds to be transferred from this facility to Ontario for release, allowing Front Royal to become an active participant in the release program. 3 of 4 pairings fledged 14 young (10 from 1<sup>st</sup> clutches, 3 from 2<sup>nd</sup> clutches, and 1 from a 3<sup>rd</sup> clutch). Eight young were transferred to Ontario for release in August, though one was ultimately retained at ALS due to being blind in one eye. The remaining seven fledglings were released in Napanee, one with a radio tag. Two young that were to be released died prior to transfer to Ontario (as detailed below), and four other young from high priority pairings were retained in Front Royal. This facility will hold 17 birds over the winter, including 4 retained young and 2 retired birds.

*Little Ray's Reptile Zoo (LRR):* Though this facility was initially brought on as both a breeding and overwintering facility, it was decided that attempts to breed birds at this site would be delayed until there was greater need. Potential locations of breeding cages are not ideal at this facility, but may be revisited if our population grows beyond our current summer capacity. This facility will hold 11 birds over the winter, including a retired bird that was put on exhibit at the Nature Centre in winter of 2014.

*Bowmanville Zoo:* The construction of the shrike pens at Bowmanville was stalled in fall 2014 because of a nearby coldwater stream that triggered the need for an environmental assessment. Currently, it is uncertain whether this facility will be completed, so other potential partners continue to be sought.

*Riverview Zoo:* Riverview was very enthusiastic about joining shrike recovery efforts, but was not granted the requested increase in operational budget by the City of Peterborough necessary to fully commit to the program. It was also determined that they did not really have appropriate space for wintering enclosures. They were still interested in participating in the breeding program, however, so a proposal was put forth that Riverview could still erect two breeding enclosures. In light of the overwinter losses in the captive population (detailed below), it was ultimately decided that no pairs would be piloted at Riverview this year; all breeding would occur at established breeding facilities to maximize the number of fledglings produced, since retention of captive-reared birds was a priority this season to rebuild the population. The intention remains to erect two breeding enclosures at Riverview, to be ready for breeding pairs in 2016.

## ***Mortality***

Deaths in captive birds this year were approximately split between internal and external factors. Mortality due to illness was almost exclusively constrained to hatch year birds, with only one adult death due to unknown causes, and the rest due to predation or human error.

WPC staff continue to work closely with veterinarians at the Toronto Zoo and the OVC Pathology Lab to investigate causes of mortality the program, although the mortality rate has seen a substantial reduction in the last 2 years.

### Adults

We had **11 adult deaths** in Ontario this year as of November 2. Two adult deaths were 3-year-old males, both at TZ: one was found dead in its cage in January, with no clear cause of death; the other was part of a breeding pair, and accidentally became isolated in an unserviced unit of its breeding cage in July, so starvation was the cause of death. The death of the latter has been discussed with TZ staff.

The remaining 9 deaths were due to weasel predation at MRC that occurred over the period of a week in February. Mountsberg had been overwintering 12 birds at their facility. Two birds were found dead inside on Feb 22, with weasel tracks throughout the outdoor section. It was thought that the weasel gained access through

the outdoor section, so the rest of the birds at the facility were shut indoors while plans were made. Three more birds were found dead inside on Feb 24, indicating that the weasel had indoor access. Sandra Davey, Raptor Centre Lead, examined the building with Mountsberg Operations staff, and found what they believed to be the access point: a small gap (~1" width) at the back door, with some tracks leading to it. This gap was blocked, and three live traps were set inside the building. The SRB also arranged the transfer of 3 birds (all 2014-HY) to ALS (filling all remaining space at that facility) that evening. At this point, 4 adult birds remained at MRC. Since all predation had happened overnight and the birds were highly stressed being locked indoors, over the next few days, birds were let out during the day and then locked indoors for the night. During this time traps (live and snap) were also placed around the outside of the building.

Two more birds were found dead indoors on Mar 1 (Sunday). SRB made plans to move the remaining two birds to the Toronto Zoo first thing Monday morning. There was thought of putting the remaining two birds in cardboard carriers at the Raptor Centre overnight, but there were concerns of further stress to the birds. Because of this, and the fact that the pattern of predation was that there were one or two days after each event where there was no mortality, birds were left in their enclosures. They were also left with outdoor access, to give them more chance of escape if the weasel did return.

SRB went to MRC first thing on Mar 2 to gather the remaining two birds, but unfortunately they were both found dead in their outdoor enclosures.

On Mar 3 a weasel was caught in a live trap outside the back door of the shrike building. After all shrikes were gone, MRC thoroughly investigated the building inside and out (including using a black light to look for urine trails inside) but were unable locate the other point of access used by the weasel. Traps were left in and around the building until the week of Mar 23, but no further sign of predator activity was noted and nothing was caught in the traps.

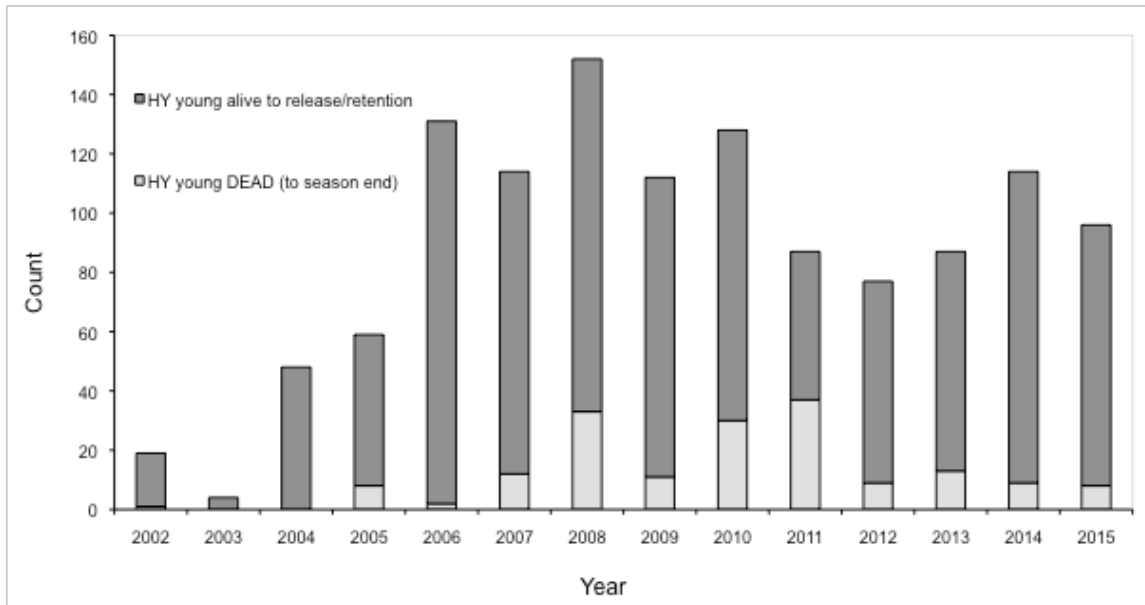
Following the incident, the response was reviewed by the SRB, Jessica Steiner (WPC Conservation Programs Director), and Sandra Davey. Though the response was overall determined to be reasonable, speed of response could be improved. If a similar situation arises in the future, birds will be moved from the facility with more immediacy (as space allows), or will be put in carriers in a secure location each night, until the threat is neutralized.

### Fledglings

There were **eight young bird deaths** (8%) as of November 2, which maintains the low level of fledgling mortality from 2014 (7%; Figure 3). Deaths were spread across all facilities this year, with 3 deaths at ALS, two at FR and TZ, and one at MRC. It is notable that all of the deaths at African Lion Safari (3) were from a single clutch, and they all presented similar symptoms: weepy eyes, a head tilt, and they appeared underdeveloped; similar to symptoms commonly seen when fledgling mortality in the captive population was high. Necropsies found urate nephrosis in two birds, which doesn't necessarily indicate the ultimate cause, as urate nephrosis is brought on through insufficient food and water intake, which could be a symptom of other illness. The most significant finding in the necropsy of the third bird was emaciation; this bird also had conjunctivitis, but that was likely an opportunistic infection of a weakened bird. These results show that the young in this brood were not able to sufficiently feed themselves, though the ultimate reason for this remains unknown.

The only other death with known cause was the fledgling at MRC, which was a bird retained for the captive population. This death came at the end of the season while winter placement was being finalized, and fledglings were still housed with adults. Aggression was beginning to heighten between the adults and fledglings in this cage, and one of the young was found dead, apparently killed by the adult. The remaining young at MRC were transferred to ALS later that day, where they were housed as a group, but separate from any adults.

Necropsy results are pending for all remaining birds.



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

### ***Captive-bred Releases***

#### ***Banding***

Eighty-five captive juvenile shrikes received stainless steel bands this season. Six of these birds were initially banded with size 2 bands, based on measured leg diameter with a leg gauge and digital callipers, but bands were found to be too large when birds were next handled (bands sitting low on the foot, causing abrasion of the hallux). Four of these bands were removed and replaced with 1D bands without incident, but the legs of the remaining two birds were broken in the process, when the vice-grips used to hold the band slipped. Both of these birds were treated at TZ, and both healed well; one was cleared for release, and the other was retained as it was from a high priority pairing. Band removal technique was examined internally by WPC, and while removing stainless steel bands always carries some risk, it was determined that the vice-grips should have been tighter. The thickness of the size 2 bands makes them more resistant to opening than 1D, so the vice-grips are more likely to slip unless they are made very secure on the band. Age of birds at initial banding was also examined, but all birds were between 33 and 45 days olds, at which point they should be fully-grown; all measurements for tarsus width were smaller at second handling that at initial banding. Extra care is always taken when applying size 2 bands to shrikes, as large bands have been associated with injury in the past. As an added precaution in future, any birds that are measured to require a size 2 band at initial handling will be left unbanded until the next handling opportunity (generally 1 week later) and legs re-measured to be certain that the proper size is applied.

Released birds that received colour-bands were given a combinations which included WH/SI on the left leg to identify them as a 2015 release bird. As in 2014, birds released with radio tags 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.

#### ***Radio tags***

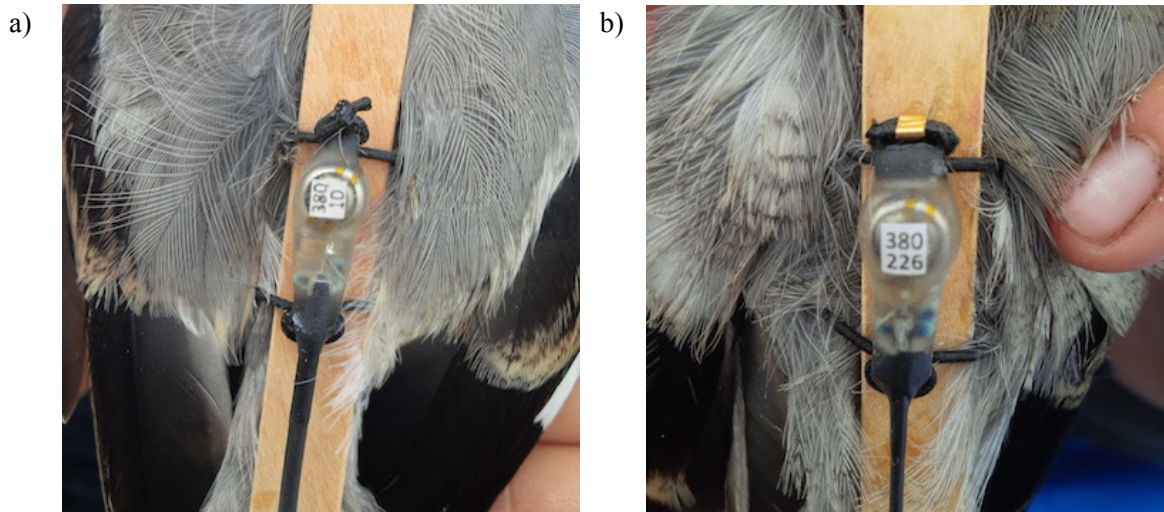
Twenty-two birds were released with radio tags on the Motus network this season, using the same nylon-coated elastic cord harness attachment technique used in 2014, but using a gold-plated crimp bead in place of a knot to secure the harness (Figure 4). Attachment method was tested on captive birds over the winter, and it was found



that in the majority of cases where tags were shed, the knot securing the harness was coming undone; the use of the crimp bead removed this weak point.

An additional three tags were removed at pre-release checks, two due to abrasion, and one because the bird stress-molted its tail during handling. This bird was held back until the tail regrew, and was subsequently released with the next group of young.

As of November 2, six birds had been detected on the Motus network, all of which had been released from the Napanee field site. All detections to date have been in Ontario, and have shown movement both to the east around the Great Lakes (detection near Kingston), and to the west, along the shores of Lake Ontario and Lake Erie. The latest detection was Sept 22 on the tower at Presqu'ile Provincial Park.



**Figure 4.** Radio tag attachment a) in 2014 using a knot, and b) in 2015 using a crimp bead, which was also glued to the top of the tag to make it more secure.

### ***The Future of the Captive Population***

Efforts continue to expand the capacity to hold our captive population, through development of new facility partnerships. We currently have capacity to overwinter 83 birds (66 in Ontario, 17 in Virginia), though 6 of those enclosures are small indoor cages, so are only used when absolutely necessary. This is currently sufficient space to house all birds, including breeders and retired individuals, but further expansion is necessary if we are to reach the recommended population of 80 breeding individuals needed to maintain genetic diversity.

With the success of the exhibit bird at Little Ray's, more effort is also being put towards finding facilities to house retired birds on public exhibit to make space for future recruitment. Interest in exhibit birds is growing in US, and the possibility has been discussed with The Wilds (part of the Columbus Zoo and Aquarium), and Fossil Rim Wildlife Centre in Texas, though neither facility presently has the capacity to take any birds.

This was the first year that birds bred at FR were released in Ontario, and opens the door for considering additional breeding facilities in the US, which has not been pursued seriously in past due to logistical concerns. Transfers were coordinated through ALS, and seven young were ultimately released at Ontario release sites; expanding captive-breeding activities to US facilities should now be viewed as a feasible option. Young from any captive-breeding facility will continue to be transferred to Ontario for release, though post-doc research by Amy Chabot will examine if the Ontario captive stock is suitable for local releases in the northeastern US (details in 'Winter 2015/16 activities', below).

## **Outreach and Landowner Appreciation**

### Public Presentations and Site Tours

Species Recovery Biologist (SRB) Hazel Wheeler was the guest speaker at the Midland Penetanguishene Field Naturalists meeting on Mar 19, where she spoke about Loggerhead Shrike recovery activities in Ontario. Approximately 50 members were in attendance, and response was very positive.

SRB had a display at the Niagara Peninsula Hawkwatch open house on Apr 30 at Beamer Memorial Conservation Area in Grimsby. It was a bit cool and without many hawks flying through, but with great attendance regardless (estimated at 500-1000 people)

SRB represented WPC at the Spring Bird Festival at Colonel Sam Smith Park in Toronto on May 23. There was much interest 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 6. Though a tour of the shrike field site has historically been a part of the festival, this activity wasn't included this year as field-breeding is no longer happening in Carden.

SRB staffed a display at Hidden Zoo Day at the Toronto Zoo on Jun 27. This was a new event that aimed to highlight the conservation work that occurs behind-the-scenes at the Zoo, including captive breeding of shrike. Attendance at the outreach displays was estimated at over 200.

Carden Biologist Leanne Grieves participated in youth outreach at Quaker Oaks Farm in Sebright on Jul 22. Leanne spoke with the five youth in attendance about Wildlife Preservation Canada, the Carden Alvar, and Loggerhead Shrike's behaviour, ecology, and endangered species status in Ontario. Outreach materials and colouring sheets were handed out, and pictures and video were put online via Facebook.

Loggerhead Shrikes were featured as part of Riverview Zoo's conservation exhibit which is an annual event that they hold every July. The theme this year was "Ontario's Species at Risk", included some live at-risk reptiles, and outreach displays for a number of other at-risk species. The shrike component, which was particularly well received, included an outreach display featuring our stuffed shrike mount, outreach materials, and a poster presentation of ongoing research. Over 13,000 people attended the zoo during this event.

### Landowner Appreciation Dinners

Landowner and Volunteer Appreciation Dinners were held in Carden on Aug 21, and Napanee on Aug 25, each with approximately 60 attendees. Tours of the release sites were given prior to the dinners, with 6 attendees at each. At both dinners, staff shared season's results over a powerpoint slideshow of pictures from the season, and outreach materials were made available. Though the dinners continue to function well as a show of appreciation for supporters of Loggerhead Shrike recovery, they are less effectively accomplishing the goal of achieving broader outreach to new community members and landowners. As such, we have started to look at whether the resources that go towards these dinners may be more effective if applied to another type of event (e.g. landowner workshop). At the end of each dinner, the crowd was asked to think about what they might like to see in future. All attendees will be sent a brief survey to this end over the winter, with responses used to guide future regional outreach activities.

## **Habitat Stewardship Program**

Five stewardship projects have been identified for fall/winter completion: two in Napanee, and three in Carden. Both of the Napanee projects (one water system, one fencing project) had been developed in past years, but were delayed due to insufficient funds. Both projects will allow the expansion of cattle grazing on those properties,

thus increasing the amount and quality of shrike habitat. These projects will be coordinated by the SRB. All three stewardship projects in Carden involve installation of fencing: Two projects will repair lengths of cattle fencing, and one project, will install permanent cattle-exclusion fencing around a prescribed burn area in Carden Alvar Provincial Park. Carden projects will be coordinated by Couchiching Conservancy staff.

### **Building Regional Capacity**

WPC staff continue to participate as part of the steering committee of the Napanee Plains Working Group. A number of collaborative initiatives were discussed at a meeting of the group in June, and will be pursued over the coming year. In the short-term, these initiatives include alvar-specific species fact sheets, a landowner education workshop in the spring, and mapping of ecologically important and/or protected areas in the region to guide future land acquisition. Longer-term initiatives include development of more detailed outreach materials, coordination of comprehensive regional surveys (Napanee bioblitz), and the need for regional involvement in Loggerhead Shrike recovery activities. Bird Studies Canada (through the Important Bird Areas program) and Lennox & Addington Stewardship Council have made verbal commitments to take more active roles, either through assisting with wild population monitoring or through coordination of habitat stewardship project, respectively. Their specific roles in recovery activities in the Napanee area will be refined over the coming year.

### **Fundraising**

#### Secured 2015/16

- HSP \$75K
- EC G&C \$25K
- OSAR-SF \$61,990
- EC Science Horizons \$12K
- NSERC \$10K (+ \$15K ALS commitment)

#### 2016 onwards

WPC has submitted a 3-year application to OSAR-SF to implement the LOSH Recovery Strategy in Ontario, which includes building regional capacity with partner organizations to carry out priority recovery actions. This application includes two field biologists (one each in Carden and Napanee), that will continue to perform wild population monitoring, but with lower intensity than in past. This staffing model was used in 2015 and achieved adequate results for both wild and captive activities. Funding will also be sought from HSP to achieve the same goal.

As a requirement of their Overall Benefit Permit for the Kingston Solar project, Samsung is expected to provide \$240,000 to WPC to release 40 LOSH in Ontario over the next 3 years. We have also received \$13,000 in grant commitments from private foundations. These funds will be used to support SRB salary and captive management activities which cannot be funded through other means.

### **Winter 2015/16 activities**

#### Migratory urge study

A research project examining the effects of captivity on migration urge was discussed at the LOSH Recovery Team Captive Sub-committee meeting in January, with the goal of determining feasibility of adult releases. The experimental design of such a project in the context of the captive shrike population will be developed over the winter, with the goal of undertaking this project during the 2016 field season.

#### Stress hormone research

Results of this research were disseminated at the LOSH Recovery Team Captive Sub-committee meeting in January, and no further activity was undertaken in Ontario in 2015. However, building on discussion of the results, FR began collecting feathers from their captive birds to supply samples to answer questions regarding

levels of stress hormones in birds at different facilities, or between paired versus unpaired birds, No analysis has yet been performed.

#### PVA

A draft PVA was circulated to the Recovery Team in March for comment. The final PVA is yet to be circulated.

#### SNPs

A genomic library has been created for Loggerhead Shrike to facilitate SNP (single nucleotide polymorphism) discovery and analysis. Using Illumina HiSeq technology, we obtained 'deep' coverage for one individual, which was aligned using the Zebra Finch as a reference. A shot-gun genomic library was then created using DNA from 5 individuals in a separate Illumina HiSeq run, with results from coverage aligned with previously obtained data, thereby identifying 'real' SNPs. As a final stage of the project, a library is being created using founders, and to the extent possible, current breeders using ddRADSeq technology, with NGS sequencing on an Illumina MiSeq. Data analysis will look at diversity levels within and among cohorts (founders versus current breeders) and core areas (i.e. founder natal origin).

#### Ecogenomic tools for endangered species conservation and management

Amy Chabot was awarded an Industrial NSERC for post-doc work, in partnership with African Lion Safari, 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. Work began this summer, and will continue through the winter.

#### 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 collaborative research and conservation initiative, as a means to address knowledge gaps for LOSH outside of Ontario and individual state priorities. Using feedback from state partners, Amy has prepared a Draft Conservation Action Plan for shrike. A North American Loggerhead Shrike Workshop has been organized, with the first workshop/meeting held as a side meeting at the annual Partner's in Flight meeting (Oct 6-9, 2014), and a second workshop on November 2, 2015, in association with the SE PIF annual meeting. Draft banding and survey manuals, based on ELOSH protocols, have been prepared. Representation on the Working Group includes partners from Virginia, West Virginia, Indiana, Tennessee, North Carolina, Georgia, Arkansas, Maryland, Kentucky, and Louisiana, Missouri, Oklahoma and Texas Pennsylvania, Ohio, Florida and South Carolina. The Loggerhead Shrike has been adopted as a focal species by C2S2 under their new Avian Sustainability Program. Katy Palfrey, C2S2 Executive Director, has been assisting in efforts to develop work with state partners, with plans to host a meeting at The Wilds in Ohio (a C2S2 partner) early in 2016.

A need remains for a formal Ontario coordinator of US outreach activities, as WPC's priority moving forward will be on the captive-breeding and release program, with limited wild population monitoring associated with evaluating those activities. 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.