



Global Re-introduction Perspectives: 2013

Further case-studies from around the globe

Edited by Pritpal S. Soorae



IUCN/SSC Re-introduction Specialist Group (RSG)



Field propagation and release of migratory Eastern loggerhead shrike to supplement wild populations in Ontario, Canada

Jessica Steiner¹, Amy A. Chabot², Tara Imlay³, Jean-Pierre L. Savard⁴
& Bridget J. M. Stutchbury⁵,

¹ - Species Recovery Biologist, Wildlife Preservation Canada, 5420 Highway 6 North, Guelph, Ontario, Canada jessica@wildlifepreservation.ca

² - Research Associate, Department of Biology, Queen's University, Kingston, Ontario, Canada amy@chabotcuddy.ca

³ - Species Recovery Biologist, Wildlife Preservation Canada, 5420 Highway 6 North, Guelph, Ontario, Canada tara.imlay@gmail.com

⁴ - Scientist Emeritus, Environment Canada, 801-1550 av d'Estimauville, Québec, Canada Jean-Pierre.Savard@ec.gc.ca

⁵ - Professor, Dept. of Biology, York University, 4700 Keele St., Toronto, Ontario, Canada bstutch@yorku.ca

Introduction

The loggerhead shrike is one of two species of shrikes (Laniidae) in North America, and the only shrike with an exclusively North American range. The species has undergone one of the most persistent and drastic population decline of any North American passerine and is now largely extirpated from northeastern North America, with the exception of a very small population in Ontario, where recovery actions are focused. The Ontario population is classified as the subspecies *Lanius ludovicianus migrans*, however recent research suggests it represents a unique genetic cluster significantly different from *L. l. migrans* (Chabot, 2010). The known number of breeding pairs in the province ranged from 20 to 35 pairs in the past decade and the global population is likely less than 100

individuals. The loggerhead shrike is protected internationally (Canada, Mexico and USA) by the Migratory Birds Convention Act (1916), and *L. l. migrans* is listed federally in Canada as Endangered under the Species at Risk Act. Globally, the species is classified as Apparently Secure (IUCN). This passerine is unique in its predatory and impaling behaviors, and is equipped with a raptor-like beak. It is often



Loggerhead shrike © Larry Kirtley

considered a 'flagship' species for grassland birds, a guild of high conservation concern.

Goals

- Goal 1: Preserve the genetic diversity of loggerhead shrike in eastern Canada.
- Goal 2: Provide a suitable source of birds for re-introduction to augment the wild population.
- Goal 3: Undertake research to increase the effectiveness of the breeding and release program (apply adaptive management).
- Goal 4: Undertake other research to enhance management of the wild population, e.g. disease (West Nile virus), diet, toxin studies, dispersal and migration studies (radio-tracking, geolocators).
- Goal 5: Re-establish a viable, self-sustained, and broadly distributed wild population of *L.l. migrans* in the current population range and re-establish the species in parts of its historical range in Canada.



Shrike Chicks (10 days old) © Tracy Anderson

Success Indicators

- Indicator 1: Breeding of *L.l. migrans* in captivity.
- Indicator 2: Survival and return of released captive-reared birds to breeding grounds in Canada.
- Indicator 3: Captive-reared birds breeding in the wild.
- Indicator 4: Captive population retains genetic diversity (maintain 90% of the genetic diversity of the founder population for 25 years).
- Indicator 5: An increase in the number of breeding pairs in the wild in Canada.

Project Summary

Feasibility: Population monitoring began in the 1980s with annual comprehensive surveys starting in the early 1990s. Evaluation of habitat availability indicated the presence of extensive suitable but unoccupied habitat in the historical range in Ontario. At the time this program was established, captive breeding of shrikes was already underway for other subspecies: *L. l. mearnsi* and *L. l. excubitorides*. Release site selection considered habitat suitability at the site, extent and proximity of other suitable habitat, projections of land-use over time, logistics, community support, and the existence of wild pairs in the region.

Implementation: Founder stock was obtained as nestlings (n = 48) from wild pairs in 1997 and 1998. Breeding occurred at the Toronto Zoo (Toronto, Ontario)

and McGill University (Ste Anne de Bellevue, Quebec) initially to obtain a viable captive population (i.e. maintain genetic goals). In 2001 an experimental *in-situ* field propagation program was initiated. Current release efforts focus on supplementing existing populations rather than re-establishing locally extirpated ones. Pairs are bred in large field enclosures within suitable shrike habitat; while food (crickets, mealworms and hopper mice) is provided, birds are also able to hunt wild prey entering through the mesh walls, and are exposed to natural predators (e.g. merlin (*Falco columbarius*)). Young are soft-released into their natal territory and receive supplemental food. Young are also produced at *ex-situ* breeding facilities, with young “hacked out” at the field sites. From 2001 - 2012, 663 juvenile shrikes were released with ca. 100 young released annually in some years (2006 to 2010). Thirty confirmed sightings of returning birds have been made to date, with the first captive-reared bird returning to successfully breed with a wild shrike in 2005 (Nichols *et al.*, 2010). The return rate observed for captive-reared shrikes is in-line with that reported for wild juveniles in Ontario and elsewhere, and productivity in the wild is similar to that of wild pairs in the province (Lagios *et al.*, in press). Evaluation of release techniques (e.g. release group size, age) has allowed for adaptive management to improve results in terms of returning birds (Lagios *et al.*, submitted).

West Nile virus (WNV) and *Capillaria sp.* (nematode parasite) have been the major identified disease concerns for the program. The captive population is vaccinated annually against WNV since 2008. *Capillaria* exists normally within the wild population; routine fecal/pellet screening and treatment aim to reduce parasite burdens in captive birds rather than completely eliminate it. From 2007 - 2011 the program experienced substantial fledgling mortality and deaths of young (<4 years old); necropsy results were largely inconclusive but ruled out an infectious disease agent. In 2010 we began consultations with epidemiologists to further investigate causes but no obvious cause was identified. The issue is likely multifactorial including environmental conditions, stress from double clutching and cage density. Collaboration with epidemiologists to identify and mitigate contributing factors continues.

The captive breeding and release program is tightly integrated with other recovery activities, e.g. wild population monitoring, color banding, habitat restoration and stewardship, outreach and education, and research to address knowledge gaps. An external review of the program (Kleiman & Lynch, 2008) concluded that the release program had achieved success relatively early (as defined by returning birds successfully breeding in the wild) and suggested that the program would ultimately provide a model for future recovery programs for other shrike populations in North America and other at risk migratory passerines.

Post-release monitoring: All released birds are colour banded; since 2009 a unique 4-colour combination has been used. Immediate post-release monitoring follows birds as they disperse from the field site and intensive field staff surveys spot returning birds in subsequent seasons. These efforts are supplemented by a volunteer Adopt-a-Site program and additional outreach to the birding community to “Spot a Shrike, Save a Species”. A network of partners and volunteers was

established in the U.S. to aid in detection of banded shrike along migration routes and on wintering grounds. There have been several recent sightings of banded birds in the U.S., two of these captive-reared birds appearing in Ohio and northern Virginia during migration.

A radiotelemetry study found that shrikes tolerate radio-transmitters (and behave normally) and we observed 75% survival of release young pre-migration (Imlay *et al.*,

2010). Birds moved too quickly out of Canada to track migration routes, even with the use of aerial telemetry. To locate the wintering grounds, geolocators were deployed on 108 shrikes from 2009 - 2011. Although 3 geocator birds returned to Ontario and were successfully re-trapped, in all cases the devices had failed prior to onset of migration. Further trials with captive shrike suggest that the failures are not caused by the shrikes themselves and we will continue this study in 2013.



Observing captive loggerhead pairs

© Wildlife Preservation Canada

Major difficulties faced

- Migration routes and wintering grounds for the Ontario population are unknown, therefore we cannot yet monitor birds or determine threats outside of the breeding season.
- Unexplained mortality in the captive population undermines its genetic viability and the numbers released.
- It is difficult to maintain community goodwill towards the release program when there is a lack of clarity surrounding enforcement of provincial endangered species legislation and the federal Recovery Strategy which identifies Critical Habitat on private lands; community polarization impacts property access and monitoring efforts.
- Sustained funding to maintain a full-scale and long term program, that crosses geo-political boundaries.
- Issues with field surveys include high dispersal of young, nesting on private properties, low detectability of shrikes.

Major lessons learned

- Successful breeding and high productivity achieved through *in-situ* breeding conditions.
- Young that are parent-reared *in-situ*, and provided with live prey, demonstrate a full range of natural behaviors and show a high rate of survival post-release.

Birds

- Due to the species' foraging behavior, cage height was an important dimension in reducing stress and increasing breeding success and productivity (increasing cage height from 2.4 m to 3.0 m had positive results).
- Ongoing communication, good-will, and partnership development with stakeholders is key; this includes local landowners, and industry, e.g. beef, aggregate, renewable energy (wind and solar).
- Successful recruitment of captive-reared young into the wild population over successive years shows captive breeding is a viable conservation tool for migratory birds.

Success of project

Highly Successful	Successful	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- Production and release of large numbers of young annually.
- *In-situ* breeding conditions, soft-release and supplemental food.
- Integration of release program with other recovery activities, including surveys of wild population, stakeholder engagement and habitat stewardship.
- Recruitment of captive-reared individuals depends on their successful migration, wintering in an unknown location, and return to breeding grounds.
- Despite the successful captive breeding program; the wild population has not increased in size due to threats during the non-breeding season.

References

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