

Field Propagation and Release of a Migratory Passerine: success through adaptive management

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INTRODUCTION

- The eastern loggerhead shrike (*Lanius ludovicianus migrans*) is found in south central Canada and the eastern United States. This subspecies has shown the most rapid decline of any migratory shrike in North America (Pruitt 2000) and is one of the rarest passerines in Canada.
- A captive population was established in 1997 when numbers had decreased to only 18 known wild pairs remaining in Ontario, Canada. An experimental field propagation and release program was initiated in 2001 to develop techniques.
- The term 'field propagation and release' refers to the breeding of captive adults in field enclosures, allowing them to raise their own young, and then subsequently releasing those young into the wild from the same location.



Larry Kirley

METHODS

STUDY SITE

- Within historical breeding range and natural habitat.
- Two release sites in southern Ontario, Canada (red dots Figure 1).
- Considered a Re-establishment/Supplementation (IUCN 1998).



Figure 1

FIELD PROPAGATION AND RELEASE ENCLOSURES

- Easily constructed in fields of short grassland in natural setting.
- From 2001 to 2003 we actively experimented with enclosure design, height, placement and pairing recommendations to determine techniques for optimal productivity.
- Enclosures consist of two units (Fig 2 A) or three units (Fig 2 B) and each unit now measures 3.08m x 2.44m x 3.66m or 4.88m.
- Built around a live thorn tree and furnished with food, water, perching and impaling branches, nesting cups and nesting material.



A



B

Figure 2: Field propagation and release enclosures

BREEDING PAIR MANAGEMENT

- Selected birds (based on genetics and breeding history) are transported from over-wintering facilities to field sites in late April.
- Pairs are introduced once signs of courtship are obvious.
- Minimal human disturbance during breeding episode.
- Young separated from parents at age similar to wild independence.

RELEASES

- Juveniles released at 45-65 days old (groups of 6-12, similar ages).
- Soft-release techniques include an acclimation period, pre-release training, supplemental feeding and post-release monitoring.

RESULTS

PRODUCTIVITY

- Total of 360 fledglings produced since 2001.
- Number of young produced has greatly increased from 10 in 2001, to 129 in 2006, and 111 in 2007 (Figure 3).
- Number of pairs double-brooding has increased from 0 in 2001 to 10 in 2006 (Figure 3).

RELEASES

- Total of 301 young shrikes have been released.
- Number of young released each season has increased substantially from 10 in 2001, to 111 in 2006, and 91 in 2007 (Figure 3).
- All of the young released have been parent-raised and released from the field sites.

SIGHTINGS AND RETURNS

- Overall return rate of release birds between 2001 and 2007 was 2.9% (6/210).
- Annual return rates of juveniles released the previous season ranged from 2% to 3.8% (Figure 4).
- At least four release birds have returned to breed with wild mates and successfully fledge young, the first in 2005 (Figure 5).

ADAPTIVE MANAGEMENT

A combination of adaptive management measures implemented in 2004/5 have increased productivity of breeding pairs 2- to 3- fold:

- Increasing enclosure height and having a shared wall has resulted in an increase in number of pairs double-brooding.
- Aggregating the field enclosures has increased number of successful pairs breeding per season.
- Larger wintering enclosures with outdoor access has improved fitness and flight skills of wintering birds, increasing the likelihood of breeding in spring.
- Inclusion of breeding history in pairing recommendations (i.e. having at least one proven breeder per pair and keeping together successful pairs as long as possible) has increased number of pairs breeding and number of double-broods.

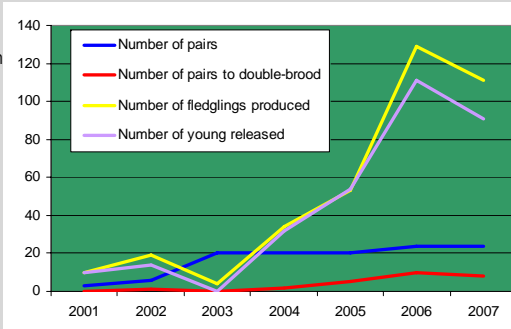


Figure 3: Productivity of pairs and number of young released in Ontario since 2001

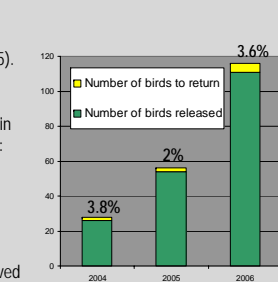


Figure 4: Annual return rates of release shrikes from 2004-2006



Ethan Meleg

Figure 5: Fledgling of 2004 release female

DISCUSSION AND CONCLUSIONS

PRODUCTIVITY

➢ Productivity has greatly increased since the program's inception due to a conscious effort to be flexible and open to new ideas while adaptively managing techniques. Techniques take into account wild shrike behaviour and life history traits of the species. Some examples include:

- 1) Enclosure height being increased to over 3m high to minimize stress during management and to accommodate this species' natural behaviour of perching high in open fields.
- 2) Field enclosures placed within 50m of each other to promote breeding as this species tends to aggregate on the breeding grounds.
- 3) Successful breeding pairs returned to the same field enclosure in consecutive seasons to mimic the site fidelity exhibited by wild birds.

RELEASES AND RETURNS

- Annual returns of release birds has been up to 3 times the return rate reported for juvenile shrikes in wild migratory populations (0% return rate reported by Brooks and Temple 1990, and up to 1.2% return rate reported by Collister and DeSmet 1997).
- Project aims to release birds in large numbers annually (100+): to counter high rates of mortality during migration, and since number of animals released has been shown to be a significant predictor of population re-establishment (Beck *et al.* 1994).

ADVANTAGES TO FIELD PROPAGATION AND RELEASE

- Flexibility and ease of enclosure construction in the field allows breeding to occur within species' natural habitat and range.
- Mesh allows entry of wild prey for balanced nutrition, and large enclosures resulted in young developing strong flight skills before release.
- Production of parent-raised young (no imprinting) with strong hunting skills and exhibiting avoidance behaviour to natural predators.

APPLICATIONS FOR OTHER REINTRODUCTION PROJECTS

Field propagation and release can be extremely straightforward and cost-effective, and produce skilled young animals that have been raised by their parents for the full breeding episode in their natural environment, acclimatized to the release site, and released into their natal territory. Candidates for this type of reintroduction may include:

- 1) Species that are difficult to breed in captivity or when space limitations or overcrowding may cause low productivity.
- 2) Hand-rearing and other captive breeding programs where human contact is causing behavioural problems.
- 3) Species that require natural surroundings for breeding.
- 4) Wild translocations where individuals tend to return to their capture site.
- 5) Populations so small that wild to wild translocations are not feasible or extremely difficult.

➢ Field propagation can be adapted for many situations and many taxon including mammals, amphibians and reptiles.

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