



Florida Scrub-jay Translocation Guidelines June 30, 2011

SUMMARY AND OBJECTIVES

The Florida scrub-jay (*Apelocoma coerulescens*) is listed by the U.S. Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FWC) as a threatened species due principally to habitat loss from development and agriculture and habitat degradation from fire exclusion. Translocation, the movement of a species from one location to another by people, is a potentially useful tool for scrub-jay conservation. The objective of translocation is to promote the persistence of scrub-jay metapopulations by increasing the size of, and connectivity among, local populations. To accomplish this objective, translocations can involve reintroduction (returning scrub-jays to areas from which they have been extirpated) or augmentation (increasing the size of extant populations). Translocation is only one tool for conserving scrub-jays; habitat management remains the most important conservation method for this species.

These guidelines represent recommendations of the USFWS and the FWC to help land managers, researchers, and others considering translocation of Florida scrub-jays for conservation purposes. *Use or application of the following guidelines are not intended to satisfy Federal regulatory requirements and, therefore, do not substitute for minimization or mitigation measures associated with Federal permitting requirements.* The methods and techniques in these guidelines represent what the USFWS and the FWC consider the minimum standards for scrub-jay translocation based on past and current translocation efforts. Conservation practitioners may choose to exceed these standards (e.g., by using radio transmitters for more detailed monitoring).

The USFWS and the FWC support limited scrub-jay translocation efforts using the recommendations provided in these guidelines. We believe adoption of these recommendations will reduce risks to source populations, increase translocation success, and target translocation activities where a conservation need has been demonstrated. Scrub-jay translocations are experimental in nature. Methodologies are not developed sufficiently for translocation to be considered a routine management tool for scrub-jays, and translocations are not appropriate in all situations. The USFWS and the FWC will evaluate proposals on a case-by-case basis to determine if the potential conservation benefit outweighs the risks inherent in conducting a scrub-jay translocation. These guidelines will be amended as new information becomes available.

INTRODUCTION

Florida scrub-jays are sedentary and highly territorial, have strong site fidelity, and rarely disperse long distances. In addition, scrub-jays are highly social and exhibit conspecific attraction.

Therefore, when scrub-jays disperse, they are less likely to settle in unoccupied patches of potential habitat. As a result, when scrub-jays are extirpated from patches of suitable habitat, successful recolonization may take many years, or may not occur at all. Suitable habitat is generally defined as an oak-dominated scrub or scrubby flatwoods with low, open shrub structure, exposed sandy openings, and few trees.

Additionally, much of the remaining scrub-jay habitat is reduced in size, fragmented, and overgrown due to fire exclusion. Fragmentation increases isolation of scrub-jay populations and reduces the probability of immigration. As scrub-jay habitat is restored on conservation lands, immigration may not be sufficient to increase small remaining scrub-jay populations. Without sufficient immigration, small populations will continue to be vulnerable to the adverse effects of stochastic events.

The long-term persistence of scrub-jays will require that some currently small populations increase in size and that some extirpated populations be restored. Because of the limitations described above, however, natural immigration alone may not be enough to augment small populations to self-sustaining population levels. In some cases, human-assisted dispersal (i.e., translocation) of scrub-jays may be necessary.

The translocation of scrub-jays has been conducted at three locations. Valuable information has been, and continues to be, gained from these efforts about appropriate methodologies and techniques that may increase translocation success. As we learn more, these guidelines will be modified. The USFWS and the FWC believe adherence to these guidelines will help future efforts provide valuable information to refine translocation methodologies.

CONSERVATION OF GENETIC HETEROGENEITY

Recent analyses indicate there is a substantial amount of genetic variation among some scrub-jay metapopulations (Coulon *et al.* 2008). Conservation of genetic diversity provides the evolutionary potential necessary for species to adapt to changes in their environment over time and therefore is beneficial to the long-term survival of species. Genetic diversity can serve an important role at the metapopulation level as well as the species level by ensuring that long-isolated metapopulations remain uniquely adapted to local environmental conditions.

There remains much debate about how genetic information should be used in the formulation of conservation or management practices. Given current data on scrub-jay genetic diversity, it seems prudent to maintain existing scrub-jay genetic heterogeneity to the maximum extent possible. Translocations should not occur between genetic clusters (see Figure 1), except in extenuating circumstances to be determined by consultation with the USFWS and the FWC.

SOURCE POPULATION

Ideally, the source of scrub-jays for translocation would come from very small, isolated populations with little chance of long-term persistence or from healthy and growing populations that would not likely be affected demographically by the loss of translocated birds. Previous efforts have translocated both entire family groups and non-breeding helpers ranging from yearlings to older birds. The conclusions from these previous case studies suggest: 1) moving helpers, especially young of the year, is likely to have the least impact on source populations; 2) the establishment rate of non-breeding helpers is relatively high when these individuals are used for re-introductions; 3) moving

entire family groups is more likely to have an impact on source populations; 4) but moving entire family groups seems to be more successful than moving non-breeders when augmenting existing populations. Given these considerations, source populations should meet one or more of the following criteria:

1. Individual birds and/or family groups on private lands that are covered by Federal incidental take permits/authorizations where any legally required minimization and/or mitigation obligations have been fully met.
2. Individuals and/or family groups from healthy and growing populations on public or private conservation lands that meet the following criteria:
 - a. *Translocating non-breeding helpers*: Candidate individuals are part of a population on managed land(s) with greater than 15 groups where the mean group size exceeds three birds/group. Mean group size is likely only to exceed three birds/group in healthy populations at carrying capacity because surplus birds remain in their natal territories as helpers. Mean group size is likely to be below three in declining populations or populations that are expanding into unoccupied habitat. These criteria are therefore self-limiting. Birds can be moved from these populations as long as mean group size exceeds three and the number of groups exceeds 15. However, no group may be reduced below three birds. If translocations begin to affect population size and mean group size of the source population, then translocations cease until mean group size once again exceeds three and the number of groups exceeds 15.
 - b. *Translocating entire family groups*: Candidate family groups are part of a population on managed land(s) with greater than 15 groups where the mean group size exceeds three birds/group. No more than 10% of the family groups can be moved in any one year. To prevent negative impacts to source populations, this percentage may be adjusted by USFWS and the FWC as additional data or population models become available. We assume that if a population is healthy and at carrying capacity, surplus breeders will quickly fill vacant habitat following removal of translocated family groups. Additional translocations of family groups from the managed land(s) can continue only if and/or when the population recovers to its pre-translocation number of groups.

RECIPIENT SITE/POPULATION

Translocations may involve the reintroduction of scrub-jays to previously occupied areas or the augmentation of existing populations to achieve the objective listed earlier in this document. The USFWS and the FWC will evaluate each potential recipient site based on the benefit to its larger metapopulation and/or genetic unit. A list of priority sites is not currently available. Characteristics of recipient sites will depend on circumstances specific to each metapopulation and/or genetic unit. Generally, we anticipate high conservation benefit from translocation proposals that conserve scrub-jays on well-managed sites that are part of a functioning metapopulation. Appropriate recipient sites or populations should meet the following minimum criteria:

1. The site has been reviewed and approved by the USFWS and the FWC as a priority recipient site and meets the following criteria:

- A. A public conservation property, or a private property with a perpetual conservation easement, whose primary function is to preserve, protect, and perpetually manage biological resources and functions, and,
 - B. Is included within a land management plan specifying spatially and temporally appropriate management actions to maintain scrub-jay habitat, and,
 - C. If applicable, managers have identified and mitigated previous circumstances that led to scrub-jay population declines on the recipient site.
2. The site contains the necessary spatial extent of scrub-jay habitat, including:
- A. At least 500 acres of contiguous or nearly contiguous scrub and/or scrubby flatwoods on site, or,
 - B. A complex of at least 500 acres of scrub and/or scrubby flatwoods, when taken in combination with other appropriately managed private or public conservation lands within 0.5 miles.
3. Habitat quality at the time of the translocation should include the following:
- A. *For reintroductions:* At the time of translocation, the site should have at least 250 acres of unoccupied scrub-jay habitat that has been managed within the last five years. Of these 250+ acres, the site should have at least 50 acres of optimal scrub-jay habitat for each translocated potential breeding pair or family group. The remainder of the 250+ acres must be either optimal or have vegetation shorter than optimal height and due to reach optimal condition within two to three years. For example, if the number of translocated potential breeding pairs equals four, then 200 of the 250+ acres must be in optimal condition and the rest can be shorter than optimal height. If the number of translocated potential breeding pairs or family groups exceeds five groups, there must be an additional 50 acres of optimal habitat for each potential breeding pair. Optimal habitat contains xeric oaks with an average height from 4.0 to 5.5 feet high with less than one acre of any scrub-jay territory having vegetation averaging taller than 5.5 feet. Optimal habitat also contains less than one canopy tree per acre and has 10 to 50 percent bare sand openings or sparse herbaceous vegetation. The habitat should be as far away from a dense forest edge as possible, ideally having a 1,000-foot non-forested buffer.
 - B. *For population augmentation:* At the time of translocation, the site should have at least 250 acres of scrub-jay habitat that is optimal or shorter than optimal height but due to reach optimal condition within two to three years. Of these 250+ acres, at least 50 acres should be in optimal condition for each translocated potential breeding pair or family group; because resident scrub-jays may defend very large territories in areas below carrying capacity, the criteria that this habitat must be unoccupied is necessarily relaxed. The number of resident groups in the 250+ acres must be below carrying capacity (i.e., there should be less than 1 group per 25-40 acres prior to the translocation). Typically, population augmentation should occur in populations with less than 10 resident groups with the goal of reaching or exceeding 10 groups.

CAPTURE, TRANSPORTATION, HACKING, AND RELEASE

1. Appropriate Federal and, in some cases, local authorizations are necessary prior to initiating translocation activities and include, but are not necessarily limited to:
 - A. Local government approval, if applicable. For example, Brevard County has an ordinance that prohibits translocation of threatened or endangered species from private land to county-owned land without approval from the Board of County Commissioners.
 - B. Federal research permit (<http://www.fws.gov/forms/3-200-55.pdf>. This permit may not be necessary for agencies with a Section 6 Cooperative Agreement with USFWS).
 - C. Federal bird banding permit (<http://www.pwrc.usgs.gov/bbl/resources/forms/permitinfo.cfm>).
 - D. Federal incidental take permit with confirmation of completed minimization and/or mitigation, if applicable.

Those planning a translocation should contact the USFWS and, in some cases, local authorities to ensure that appropriate permits and authorizations are in place. Those planning a translocation also should coordinate with FWC's Avian Taxa Coordinator.

2. Translocation of scrub-jays should occur from late-November through January, when resident scrub-jays tend to be less territorial. Exceptions may be made when donor populations are at risk of habitat loss due to imminent land alteration (urban development, agricultural conversion, etc.) that has been reviewed and where incidental take has been authorized by the USFWS.
3. Donor scrub-jays should be habituated to supplemental food and traps before scheduled capture. "Dummy" traps may need to be baited several times per week for up to two months prior to the capture event.
4. Scrub-jays are most commonly captured using Potter or drop traps, although mist nets may be used as an alternative method if scrub-jays become difficult to trap. Traps should be set during the morning hours and all traps should be monitored continuously. Only trap types authorized under an individual's permits may be used.
5. Prior to transporting any scrub-jay from the site of capture, each bird shall be uniquely color-banded and marked with a metal USFWS band, if the bird has not been banded previously. If scrub-jays have been previously banded on the recipient site, coordination with other banders may be necessary to avoid using duplicate banding combinations.
6. Captured birds should be transported in enclosures that minimize risk of physical injury and in such a way as to prevent overheating and reduce stress of capture.

7. Previous scrub-jay translocations have had success using a soft release, in which translocated scrub-jays spend at least 12 hours, but no more than 5 days, in a specially designed temporary cage. A hard release (release directly into the environment following transport) may be attempted in consultation with USFWS and FWC, provided sufficient monitoring is in place to develop a case history for comparison with translocation efforts that used a soft release.
8. In areas below carrying capacity, resident scrub-jays often defend unusually large territories. Thus, when augmenting existing populations, soft or hard releases of translocated scrub-jays should occur as far as possible from the core area of the resident territories but ideally within visual and auditory distance to resident or other translocated scrub-jay groups. Past case studies suggest that translocated family groups have more success establishing territories under these circumstances than translocated non-breeders.
9. For soft releases, captured scrub-jays should be placed in temporary cages at recipient sites the same day they are trapped except when meeting this requirement could endanger the health or safety of birds or permittees. For translocated family groups, the breeding pair should be kept in the same temporary cage, and all family members should be kept together if possible. When moving individuals, unrelated individual male and female birds should be paired in temporary cages. Same-sex individuals from different family groups should not be placed in the same cage. No more than one scrub-jay family unit should be placed in each temporary cage.
 - a. Temporary cages should be at least four feet by four feet by four feet in size and elevated at least three feet off of the ground. Predator control devices should be installed or incorporated to minimize risk of terrestrial predation without risk to resident scrub-jays. Each temporary cage should be top-covered to reduce overheating and potential harassment by avian predators. The cage should be designed in a way that can be modified to protect scrub-jays and their food bowls in case inclement weather develops.
 - b. Food, water, and grit should be provided at least once daily in the temporary cages. The diet should include (at a minimum) high protein (> 25 percent protein) dog food, unsalted peanuts, wax worms, or other commercially available feeder insects.
 - c. Scrub-jays should be acclimated for no less than 12 hours and no more than five days prior to release from the temporary cages.
10. Providing supplemental food may enhance establishment of translocated birds and can make post-release monitoring more efficient. Supplemental food may be provided during monitoring activities, or feeding platforms or weather-enclosed feeders may be erected near the release site and provisioned at least twice per week through 1 April or until birds disperse from the release site.

MONITORING

1. The success of scrub-jay translocations depends on many variables, many of which cannot be controlled or evaluated. Nonetheless, within the bounds provided by this document and Federal permits, USFWS and FWC encourage adaptive approaches to achieve the following goals:

- A. Short-term assessment
 1. Site fidelity and territory formation during the first year.
 2. Apparent survival through the first breeding season.
 3. Breeding attempts or evidence of nesting during the first year.
 - B. Long-term assessment
 1. Stable or positive population growth rate over a five year period.
 2. Site fidelity of translocated scrub-jays over multiple breeding seasons.
2. Post-release monitoring is essential to determine if the goals stated above are met. Monitoring should include the following general schedule:

Daily for at least five days following release,
Then twice per week through the end of March,
Then twice per month for 9 months,
Then quarterly (March, July, September, December) each year for five years.

Monitoring shall include documentation of band combinations observed, where the birds were located, their affiliation with other banded or unbanded scrub-jays, and behaviors associated with territory formation and breeding. Analysis of monitoring data should include calculation of the number of groups, mean juveniles/group (for July survey only), and mean group size. March and July surveys should include 3 days of surveying (preferably consecutive) to obtain a rough estimate of territorial boundaries (March) and obtain better estimates of the number of juveniles/group (July).

A protocol should be in place for surveying surrounding properties if translocated scrub-jays are not found at the release site during monitoring efforts. At a minimum, this protocol should include coordination with managers of adjacent conservation lands.

3. The first annual report to USFWS and FWC should include, at a minimum, a map and spatial location of release site; the number, age, sex, and band combinations of translocated birds; time and location of capture; travel time to release site; time spent in temporary cages; release time; a summary of movements; establishment of territory; any observed breeding activities, including nesting behavior, fledglings, or juveniles; interactions with resident and translocated groups; documented mortality; number of groups, mean group size, and number of juveniles per group at the release site; a summary of actions taken to enhance translocation success that are not specified in this guidance; and recommendations that would improve translocation efforts in the future. After the first year, subsequent annual reports do not need to repeat information about capture, travel time, time in cages, and release time.

For additional information on scrub-jay translocations or the application of these guidelines, please contact Todd Mecklenborg (USFWS, 904-731-3029) or Craig Faulhaber (FWC, 352-732-1225).

LITERATURE CITED

- Coulon, A., Fitzpatrick, J.W., Bowman, R., Stith, B.M., Makarewich, C.A., Stenzler, L.M., and Lovette, I.J. 2008. Congruent population structure inferred from dispersal behaviour and intensive genetic surveys of the threatened Florida scrub-jay (*Aphelocoma coerulescens*). *Mol. Ecol.*17(7):1685-1701.

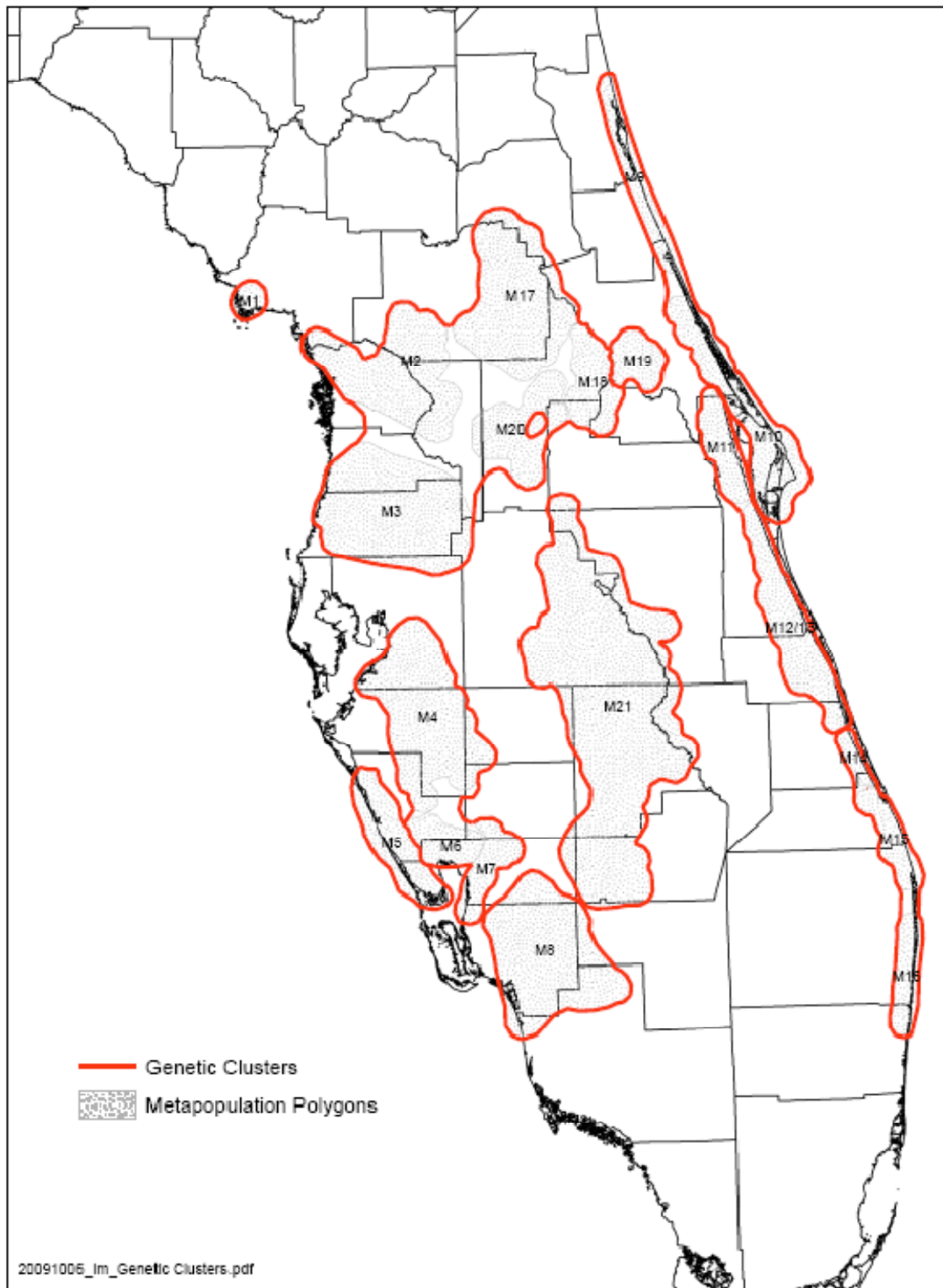


Figure 1. Florida scrub-jay genetic cluster (unit) boundaries (adapted from Coulon *et al.* 2008).