Evaluation of Trapping to Reduce Monk Parakeet Populations at Electric Utility Facilities

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ABSTRACT: Through accidental and intentional introductions, the monk parakeet, native to South America, is now established in several parts of the United States. In Florida, it occurs in 21 of 67 counties. Monk parakeets build a bulky nest structure of sticks, and they often build on electric utility substations and support structures for distribution and transmission lines. This nesting activity is incompatible with reliable electric service because nest material creates short circuits that cause power outages. Nest removal by electric utility personnel is ongoing but provides only short-term relief, as birds readily rebuild their nests. In this study, we evaluated passive and active methods to trap monk parakeets, and we documented the effectiveness of trapping to reduce rates of nest rebuilding on distribution poles. At electric substations, we tested two passive trap designs: a drop-in style trap, and a walk-in style trap. Monk parakeets were wary of traps, however, and were not easily captured even with extensive pre-baiting and the use of decoy birds. At distribution poles, we actively trapped birds at 47 nest sites using specially designed nets placed over nest entrances at night while birds roosted. Birds were then caught as they flew out of the nests into the net. Capture success at individual nest sites ranged from 0 to 100% with an overall average of 51%. Of the 47 sites where birds were trapped at night, 43 nests were removed immediately or shortly after netting. Subsequent monitoring revealed that higher nest site capture rates resulted in slower rates of nest rebuilding. We conclude that while more research is needed to design an effective passive trapping system, monk parakeets can be readily trapped from distribution pole nests at night thereby enhancing nest removal efforts.

KEY WORDS: bird damage control, electric utility, monk parakeet, *Myiopsitta monachus*, nest removal, power outage, trapping

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INTRODUCTION

Through accidental and intentional introductions, the monk parakeet (*Myiopsitta monachus*) a South American species, is now established in several parts of the United States (Spreyer and Bucher 1998). In recent data from the Audubon Christmas Bird Count, Florida accounted for 72% of all birds recorded (2000-2002, www.audubon.org) followed by Connecticut (19%), Texas (4%), Illinois (2%), and 7 additional states (<1% each). With breeding records dating back to 1969 (Stevenson and Anderson 1994), the Florida population has grown exponentially and is widespread with birds recorded in 21 of 67 counties, mainly in and around large urban centers (van Bael and Pruett-Jones 1996, van Doorn 1997).

The growth and spread of monk parakeet populations has resulted in conflicts with human activities. In south Florida, tropical fruit growers report damage by monk parakeets to numerous types of fruit (J. Crane, University of Florida Tropical Research and Education Center, pers. commun.) and significant localized damage has been documented to at least one type, the longan (*Euphoria longan*, Tillman et al. 2000). The most costly and widespread problems in Florida and elsewhere in the U.S., however, are impacts to electric utilities.

Monk parakeets build a bulky nest structure of sticks, and they often nest on electric power supply support structures including transmission line towers, substations, and distribution line poles. Nests are built high on the structure where multi-dimensional surfaces created by angled support beams, equipment brackets, or clusters of wires allow parakeets to intertwine sticks and form a stable nest foundation. Additional sticks are then added to enclose a nest chamber with a short, cylindrical nest entrance. Nests can occur singly or be compound nests composed of multiple chambers, each housing a separate pair or family of birds. Parakeets use the nests year-round for breeding and roosting, and they continually maintain and add to the nest structure. Depending on the age of the nest and utility structure used, nests can measure 1 meter or greater in diameter. This nesting activity is incompatible with reliable electric service because nest material creates short circuits, which cause power outages and damage equipment.

Monk parakeet nest-related problems have been reported by electric utility companies in New York, Texas, Colorado, Rhode Island, Illinois, and Florida. Often, the remedy for such situations has been to remove problem nests, but this approach only provides short-term

relief. Nests are readily rebuilt at the same site or on a similar structure nearby. Furthermore, nest removal may actually aggravate the problem by causing birds from compound nests to build new individual nest sites.

In this study, we examined the feasibility of using different trapping methods to augment and improve parakeet nest removal efforts. This research is part of a comprehensive effort to develop management methods to reduce monk parakeet impacts to electric utility facilities (Avery et al. 2002, 2004).

METHODS

Active Trapping – Distribution Poles

In 2002, at 47 nest sites in Dade and Broward Counties, we trapped parakeets after dusk as they roosted in their nests during the non-breeding season. Due to the dangers involved in working around electrified lines, trapping was performed by Florida Power and Light Co. (FPL) personnel using appropriate safety procedures and equipment. At each site, preliminary determinations of nest entrances were made earlier in the day. Then, after dark, we employed a truck equipped with a hydraulic bucket lift to raise personnel to the appropriate height in order to quickly place a net over the nest entrance (Figure 1). Since activity outside the nest can result in parakeets flushing from the nest, the trapping crew made every effort to approach the nest as quietly as possible. For each nest, we recorded the number of birds captured and the number escaped. Where possible, most nests were removed immediately. Others were removed the following day. Captured birds were euthanized using carbon dioxide gas (Gaunt et al. 1997). We revisited the nest sites on 6 separate occasions at 4- to 6-week intervals to document nest rebuilding activity.

Figure 1. Deployment of net from bucket lift.

The initial parakeet trapping net was based on previous designs used in South America (Martella et al. 1987, Eberhard 1997). Similar in appearance to an oversized butterfly net, the net is constructed primarily of thin black rip-stop nylon fabric and measures 0.75 m in diameter at the entrance, tapering to 0.5 m over its 9-m length. A rigid hoop keeps the entrance open and is mounted to the end of 2.5 m plastic pole. Other features include a "window" of translucent fabric sewn into the top of the entrance to allow some light to pass through when the net is placed over the nest entrance, woven mesh at the end to provide ventilation, and a zippered bottom opening to allow for the easy removal of captured birds.

We reasoned that the active trapping approach at nests on distribution poles could likely be improved through design of lighter, more flexible nets with different-sized heads so that multiple openings at a nest structure could be covered and so that the nets could be used in tighter spaces. To that end, new, redesigned nests were produced by a commercial firm and put into operational use in the field in 2003 by FPL.

Passive Trapping – Electrical Substations

Two different trap designs were used, each tested for extended periods at separate substations. Traps were sited within the fenced area of each substation in a location that was highly visible to resident birds and was relatively free of human and vehicular activity. Captured birds were euthanized using carbon dioxide gas (Gaunt et al. 1997).

Passive Trap 1

We adapted a drop-in style decoy trap designed by Bashir (1979) and used successfully to trap rose-ringed parakeets (*Psittacula krameri*), a species similar in size and feeding habit to the monk parakeet. The trap measured 3.1 × 3.1 × 1.8 m. It consisted of 4 side panels constructed of aluminum frame and plastic-coated poultry wire. The top panels were constructed of wood and galvanized poultry wire. The center plywood roof panel had two parallel slots for entry, 75 cm long by 5.4 cm wide. On the underside, the outer edge of each slot was trimmed with metal flashing to prevent escape. A tray constructed of wood and metal screen was suspended 60 cm beneath this panel and was baited with premium bird food and locally selected tropical fruits. The trap was provisioned with shaded perches, supplemental food, and water. An electric fence was erected around the perimeter of the trap to discourage predators.

The trap was initially installed at a substation with a resident population of about 15 parakeets. After 7 days, we moved the trap to a substation supporting a substantially larger resident population of parakeets (>100 birds). Four wild-caught decoy birds were placed inside. This trap was tested again at a third substation (population >50 birds) using an extended prebaiting period and stepwise construction. Three commercial backyard bird feeders were erected and provisioned with sunflower and a common wild birdseed mix. Seed was replenished at 2 to 3-day intervals. On day 142, the side panels were erected. On day 149, the roof was installed without the slotted centerpiece. Finally, on day 191 the centerpiece was installed. No decoys were used.

Passive Trap 2

The second design was also a drop-in trap, but it utilized a larger funnel-style side entry and stepwise baiting system. The main body of the trap measured 4.7 × 3.1 × 1.8 m. Appended to the front of the main body was a 1.5 × 3.1-m section that stood just 1 m high. The

entrance was an open slot in the top of the shorter section. Food was presented at the entrance and at ground level immediately below the slot entrance. A funnel made of galvanized poultry wire and wood panels directed the birds from the lower food tray into the main body of the trap where additional food and water were provided. Additional provisions for comfort and protection were made as described for trap 1.

Trap 2 was deployed at two different substations. The first trial used bait alone to attract parakeets (substation population >100 birds), the second trial was conducted both with and without decoys birds (population >40 birds). A poultry wire partition created a 1.2 × 3.1 × 1.8-m compartment at the rear of the trap to house decoy birds. During both trials, trap activity was monitored on a regular basis. When sufficient interest from parakeets was achieved, bait was allowed to run out, first on the entrance tray then on the lower tray.

RESULTS

Active Trapping – Distribution Poles

Capture success at individual nest sites ranged from 0 to 100% with an overall average of 51% (118 captured of 234 total). Success was affected by a number of factors. Nest entrances adjacent to or below equipment, wires, or other structural components were difficult to cover, which allowed birds to escape around the rim of the net. Secondary entrances, sometimes unseen, also provided escape routes. Where multiple chambers occurred, only one entrance could be covered, thereby allowing others to escape. Occasionally birds fled the nest as the bucket approached. Efforts to reduce noise during preparation and raise the bucket out of sight of the nest entrance enhanced capture success.

We assigned each nest to a category based on whether all, some, or none of the birds at the nest were captured. Subsequent monitoring revealed that higher nest site capture rates resulted in slower rates of nest rebuilding (Table 1). In the 60 days following trapping and nest removal, 20% of the nests where no birds were captured had been rebuilt compared to 13% where some birds were captured and 6% where all birds were removed. Rebuild rates continued to increase over time; however, it is unclear whether these nests were rebuilt by original occupants. That 8 of 17 nests were rebuilt where all birds were captured would indicate that some nests were built by new birds colonizing a now-vacant favorable location.

Table 1. Higher nest capture rates result in lower rates of rebuilding.

Parakeets captured at nest	Rebuild rate (percent)		
	After 60 days	After 90 days	After 130 days
None (n = 10)	20%	60%	80%
Some (n = 16)	13%	44%	63%
All (n = 17)	6%	24%	47%

It is not clear that new, redesigned nets improved the capture efficiency. During April - October 2003, FPL personnel captured 701 of 1,390 adult or fledged parakeets at 685 nests on distribution line facilities. This capture rate, 50.4%, is identical to that using the original net.

Passive Trapping

No parakeets were captured using the trap designed for rose-ringed parakeets (trap 1). In the first trial, parakeets were drawn to the trap but did not identify the slots as an entry point. Instead, they crawled over the outside until finally losing interest. Using the bait station and stepwise construction method resulted in greater activity and reinforced the point of entry. Birds comfortably passed in and out of the 0.5 × 1-m central opening in the top; however, they would not enter through the slotted roof panel when it was installed.

The first trial using the funnel-style trap (trap 2) took place in June during the breeding season and lasted 38 days. Parakeet activity at the trap was low but consistent. Several times bait was allowed to run out on all but the inner tray (days 16, 30, and 38) but only non-target species entered through the funnel. The second trial produced similar results until day 42, when six decoys were added. Parakeets began to enter through the funnel shortly thereafter but were quick to escape back out the same opening. On day 112, a piece of poultry wire with two slots was installed over the opening in an effort to contain birds. This caused a decrease in activity. Many of the birds that did enter crawled back out through the slots. A total of 14 birds were captured over 127 trap-days.

DISCUSSION

Although additional refinements in capture nets might be possible, it seems most likely that increases in netting success at distribution pole nests will probably have to come through improved technique. One innovation that FPL personnel have adopted is to shine a strong beam of light on birds at the nest entrance. This temporarily blinds them to activity below the nest so that as the bucket is positioned and nets are deployed, the birds are less likely to bolt. The use of 2 nets at a time greatly increases the likelihood of capturing birds from multi-chambered nest structures, but space limitations in the bucket preclude having additional trappers at a site.

We were unable to design and construct an effective passive trapping system for use at substations. Parakeets are very wary and also very agile, so that when birds did enter our traps, they were readily able to exit as well. Although additional research into more effective passive trapping methods might prove fruitful, it might instead be better to focus resources on an active trapping system. Initially we did not favor such an approach, because we felt that active trapping would involve too great a commitment in personnel. On the other hand, we know that parakeets can be lured to a bait site, and that they eventually overcome initial reluctance to enter an enclosed structure, so a trapping program in which the door of the trap is closed remotely by an observer is possible. The cost-effectiveness of such a system needs to be determined, but at this time, exploring an active trapping approach seems preferable to passive trapping.

It might be necessary to combine such a trap with removal of nests from the substation in order to induce

more activity at the bait site. Furthermore, it will likely be necessary to trap more than once at a given substation to remove most of the birds. Trap-shyness could increase with subsequent trap efforts, which will make additional captures more difficult. Even if not all of the birds are trapped, however, periodic removal of nests will prevent reproduction at the site, which will curtail growth of the local parakeet population.

Remaining to be developed is an effective means to trap birds that nest on transmission line towers. These nests are generally too high to be reached by the nets used at distribution pole sites. And because transmission line rights-of-way are usually open with free public access, the establishment of a secure, unattended bait site and trap is problematic.

Overall, the operational approach taken by FPL to trap and remove parakeets nesting on its facilities seems promising. Since 2002, at substations and distribution poles, hundreds of nests have been removed and many birds associated with those nests have been trapped. While it is likely there will always be new parakeets to move into the electric utility facilities, the trap and removal operation is bound to slow the process of reoccupation. This management approach will require several years' effort to succeed, but if pursued vigorously, it should gradually reduce the overall parakeet population. It is expected to reduce parakeet nesting at substations and distribution poles to the point where only occasional maintenance will be needed.

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