

APPLICATION OF TECHNIQUES FOR FERAL PIG ERADICATION ON SANTA CATALINA ISLAND, CALIFORNIA

DAVID K. GARCELON¹, KEVIN P. RYAN² AND PETER T. SCHUYLER³

¹*Institute for Wildlife Studies, P.O. Box 1104, Arcata, CA 95518-1104; garcelon@iws.org*

²*Institute for Wildlife Studies, P.O. Box 2500, Avalon, CA 90704-2500*

³*Santa Catalina Island Conservancy, P.O. Box 2739, Avalon, CA 90704-2739*

Abstract—From 1990 through July 2003 over 12,000 feral pigs (*Sus scrofa*) were removed from Santa Catalina Island, California, in an effort to restore the island's native flora and fauna. From 1990 through 1995, the effort concentrated primarily on controlling feral pig numbers on the island, but starting in 1996 the Institute for Wildlife Studies was contracted to eradicate feral pigs from the island. The island was fenced into four zones ranging in size from 3,503 to 6,846 ha to prevent the pigs from moving between zones and as insurance against delays in completing the program. Eradication efforts accounted for a total of 2,679 pigs dispatched between 1996 and 2003. We employed several removal techniques, each with different seasonal advantages, including trapping, the use of dogs, and ground hunting. Trapping was the first technique employed in each zone and was extremely effective in reducing pig numbers when densities were high. During the eradication effort, trapping, the use of dogs, and ground hunting accounted for 57%, 23%, and 19% of pigs removed, respectively. The pig eradication required considerable effort, teamwork, and dedication by those involved. As all residents of the community were not in favor of the eradication program, efforts to remove pigs in the area surrounding the city of Avalon were complicated by restrictions placed on methods that could be employed, as well as the occurrence of some vandalism of traps and fences. As of November 2003, only a few pigs are known to exist on the island. Active monitoring and removal will continue for a minimum of two years to ensure total removal has occurred.

Keywords: *eradication, feral pig, Santa Catalina Island, Sus scrofa, techniques*

INTRODUCTION

The ecological impacts of feral pigs in various habitat types are well documented (Bratton 1975, Wood and Barrett 1979, Singer et al. 1984), and such impacts can be especially damaging to island ecosystems (Spatz and Mueller-Dombois 1975, Jacobi 1976, Peart et al. 1994). Feral pigs were introduced to Santa Catalina Island (Catalina) in the 1930s for either sport hunting or rattlesnake control (Overholt and Sargent 1971). From that time forward, until 1990, periodic sport hunting was the only control of the feral pig population. However, high levels of rooting along with a low to nearly non-existent recruitment rate of seedlings in the oak woodland habitat, indicated that hunting was not sufficiently controlling the pig population. In 1990 the Institute for Wildlife Studies (IWS) was contracted by the Santa Catalina Island Conservancy (Conservancy) to implement an intensive feral pig control program,

the results of which were reported by Schuyler et al. (2002). In 1996, the program mission was shifted to the goal of island-wide pig eradication.

While feral pig control and removal programs have been in effect in the South Pacific for a number of years (Giles 1978, Hone 1983, Hone and Stone 1989), efforts to eradicate feral pigs from island ecosystems have only been attempted in a few locations in the northern hemisphere (Lombardo and Faulkner 2000, J. Larson pers. comm.). Furthermore, at the start of the project, pigs had never successfully been eradicated from an island as large and vegetatively and topographically complex as Catalina. The level of effort required to eradicate feral pigs from a large island is considerably different from that of control efforts, where there is no concern with removing the "last animal" (Cromarty et al. 2002).

Little has been published on the methodological approach to conducting island-based eradication programs on feral pigs, so it is

important to document techniques, successes and setbacks of eradication and control programs so that future land managers will benefit from previous programs. In this paper we provide information on the methods used in the pig eradication program on Catalina.

STUDY AREA

Santa Catalina Island is located in the California Channel Island archipelago, approximately 32 km south of Point Vicente, Los Angeles, California. The island is approximately 194 km² and ranges in elevation from sea level to 648 m. There is considerable topographic relief, with numerous steep-sided canyons incising the island. Mean annual temperatures range from 12 to 20°C near the coast, and yearly precipitation averages 31 cm (NOAA 1985).

The island is home to five endemic subspecies of mammals and six plant taxa, as well as 22 additional plant taxa found only on the California Channel Islands (Schuyler et al. 2002). Vegetation on Catalina has been described by Thorne (1967). The predominant habitat types on Catalina include: oak woodland/chaparral, dominated by scrub oak (*Quercus pacifica*), Catalina cherry (*Prunus lyonii*) and *Rhus* spp.; grassland, dominated by oats (*Avena* spp.); and coastal sage, dominated by sage (*Salvia apiana* and *S. mellifera*), low shrubs (*Rhus integrifolia* and *R. ovata*) and prickly-pear cactus (*Opuntia* spp.).

METHODS

From 1990 through 1995 efforts were primarily focused on controlling the population size of feral pigs on an island-wide basis and a discussion of control program and results has been detailed in Schuyler et al. (2002). Control methods included trapping, hunting with the use of dogs, ground hunting and aerial hunting. Control methods were evaluated and each technique was refined and used to our best advantage.

Starting in 1996, a plan was developed to eradicate feral pigs from the island by dividing the island into four fenced zones ranging in size from 3,492 to 6,790 ha (Fig. 1). The plan entailed

eliminating almost all the pigs from one zone before moving on to the next zone. The eradication effort was initiated in Zone 1 and subsequently expanded to the remaining three zones. The 29 km of fencing was constructed with 1-m high hog mesh, 5 x 20 cm at ground level increasing in size to 15 x 20 cm at the top. One strand of barbed wire was secured at ground level to discourage digging and three strands of barbed wire were attached above the hog mesh. Cattle guards were constructed in three locations where the fences crossed the island's main roads to allow vehicular travel, and a push-button controlled electric gate was placed on a commonly traveled dirt road. Manually operated gates were installed on secondary roads and pedestrian gates with automatic closure devices were installed where fence lines crossed trails. Dividing the island into zones had the advantages of (1) increasing the probability that a zone cleared of pigs would remain "pig-free" if the eradication program was delayed or stopped (for financial or other reasons), (2) preventing "chasing" of pigs from one area into another area that had already had pigs removed, and (3) reducing the number of personnel required to complete the eradication effort by dividing the island into smaller sections.

A fence monitoring program was established by the Conservancy to locate any breaches in the fences that might occur. Local volunteers were

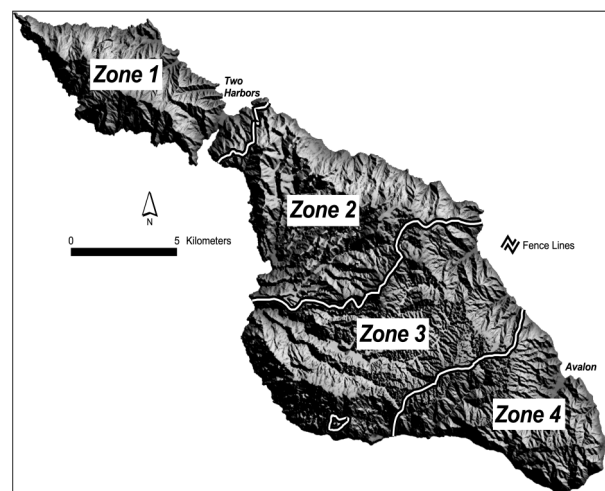


Figure 1. Map of Santa Catalina Island, California, indicating the locations of the four zones where feral pig eradication work was conducted. Zone 1 = 3,492 ha; Zone 2 = 5,238 ha; Zone 3 = 6,790 ha; Zone 4 = 2,880 ha.

scheduled to walk the fence lines once a month, as well as after heavy rains, and any damaged sections were repaired as soon as possible.

Eradication Techniques

Trapping—Trapping was the first technique employed in each zone. Trapping allowed multiple pigs to be captured at one time, and could be effective without project personnel being present. Depending on access to the traps, a few personnel could effectively trap a large area at one time. In Catalina's xeric environment, trapping was most effective during the dry summer months when high-quality natural forage was at a minimum.

We used a variety of trap styles, including corral traps, box traps, drop-nets and large fenced areas. The majority of our trapping efforts utilized corral traps, constructed with pre-fabricated 3.3 x 2.7 x 1.7 m high chain-link panels framed with 5-cm diameter galvanized pipe. These traps incorporated a trip-wire mechanism connected to a one-way swinging door. For efficiency, we generally placed traps near roads or trails. A helicopter was used to place traps and bait in remote areas. We selected trap locations based on proximity to pig sign (e.g., tracks, scat, rooting) or near areas that were likely to be utilized by pigs (e.g., water sources). Traps were usually pre-baited prior to trapping efforts, which consisted of placing bait within the traps, with the trap door locked open, for several days prior to trapping efforts. Traps were generally baited with a corn and grain-based commercial swine finishing pellet. Other baits and scents included human food waste or "slop," fruit, carrion, deep-fryer grease, extract of hog scent gland, the urine of a sow in estrus, and a variety of liquid or paste fruit scent baits. We attached transmitters on the doors of traps located in remote areas to monitor the status of the traps. If a pig entered the trap and triggered the door, a telemetry signal was emitted indicating the trap had been sprung. This system increased our efficiency by allowing project personnel to run more traps per day and to only visit remote traps if an animal was captured or to periodically replenish bait.

To reduce the possibility of ingress into areas already devoid of pigs, additional traps were placed in a 500-meter-wide buffer zone on the outside of the fenceline(s) while working within a particular zone. This action served to reduce the

density of pigs in the areas adjacent to the fence line, therefore reducing the risk of pigs entering a zone if a breach occurred in the fence.

Traps were generally set in the afternoon and then checked in the evening or early morning. All trapped pigs were humanely euthanized with a gunshot to the head, except those pigs trapped within Avalon city limits. Pigs within the city limits were chemically immobilized, removed from Avalon Canyon, and then humanely dispatched.

Hunting Dogs—Hunting conducted with the assistance of dogs was primarily used in the moist and cool winter months when dogs could more effectively follow a scent trail and were less likely to overheat. We refrained from using dogs in the summer due to the presence of a grass seed from foxtail (*Setaria* sp.) that could severely injure or kill a dog if inhaled through the nose or mouth.

The dog breeds used were primarily Catahoula curs, Plott hounds, and crosses of the two breeds. All dogs were trained to avoid non-target species by using shock collars. These dogs were bred and trained to "bay" or corner the pigs until hunters arrived. Dogs were fitted with telemetry collars to allow project personnel to find them if they chased a pig out of view or hearing range. The dogs were also equipped with protective vests before each hunt to help prevent injury from the pigs. Up to 12 dogs were used with a crew of seven hunters.

Ground Hunting—Ground hunting describes a wide variety of hunting techniques. Essentially all pigs not taken with trapping, the use of dogs, or shot from the air were classified as taken by ground hunting. Only four pigs were shot from the air as part of the eradication effort and all were in Zone 1. Methods incorporated into ground hunting included stalking, still hunting, spotlighting, shooting over food or water bait, and any opportunistic removal. Ground hunting was used opportunistically during all seasons of the year, however, some types of ground hunting had seasonal advantages, such as shooting over food or water bait, which is more effective during summer drought conditions. The firearms used included .223, .270, .308, and 6.5- x 55-mm rifle calibers. We used non-lead bullets (Barnes X-Bullets; American Fork, UT) to reduce the risk of poisoning any scavengers, including resident bald eagles (*Haliaeetus leucocephalus*).

Data recorded on the pigs removed included the date, location of kill, method of removal, age, body condition, estimated weight, sex and reproductive status. Pig carcasses were moved if near roadsides, creek beds, or water sources, but were otherwise left at the site of the kill. All carcasses were removed from Avalon Canyon.

RESULTS

From 1990 through July 2003, almost 12,000 pigs were removed from Catalina, which included approximately 9,000 pigs removed during the control program that was in effect from 1990–1995. Eradication efforts accounted for a total of 2,679 pigs being dispatched from 1996–2003. During the eradication effort, trapping, the use of dogs, and ground hunting accounted for 57%, 23%, and 19% of pigs removed, respectively.

We began our eradication efforts on the west end of the island in Zone 1 in July of 1996. The feasibility of island-wide eradication was being investigated during this two-year pilot project, and after 18 months of work the zone was declared to be free of pigs. A total of 680 pigs were removed from Zone 1, with 469 taken by trapping, 116 with the use of dogs, and 95 by ground hunting. The majority of pigs were removed early in the effort through the use of trapping, followed by the use of dogs (Fig. 2).

Between July 1998 and June 2000, a total of 817 pigs were removed from Zone 2. Trapping

accounted for 590 pigs, while 149 were taken with the use of dogs, and 78 by ground hunting (Fig. 3). By July of 2000, it was believed that the pig numbers in Zone 2 were low enough to begin work in the next zone.

The island's main population center is located in city of Avalon, in our Zone 4 removal area. As we wanted to take advantage of a perceived climate of support for the eradication by the Avalon residents and the local government, the decision was made to skip over Zone 3 and work in Zone 4 instead. The efforts in Zone 4 were planned to minimize conflicts with residents and visitors in Avalon and the surrounding area. Meetings were held several times in the year prior hunting in Zone 4 to help ensure that officials and organizations were aware of the program and had a chance to review and be satisfied with safety procedures. Trapping commenced in all areas outside Avalon Canyon in Zone 4 in July 2000. Trapping in Avalon Canyon began in October, after the busy visitor season. From July of 2000 through June 2001, a total of 307 pigs were removed from Zone 4. Trapping accounted for 158 pigs, 102 were taken with dogs, and 47 by ground hunting (Fig. 4). We also opportunistically removed one pig from Zone 1 and 27 pigs from Zone 2 during this period.

Zone 3 was the last area where the eradication effort was conducted. From July 2001 through June 2002, a total of 593 pigs were removed from this zone. Trapping accounted for 187 pigs, with an additional 154 taken by dogs and 252 by ground hunting (Fig. 5). During this period an additional

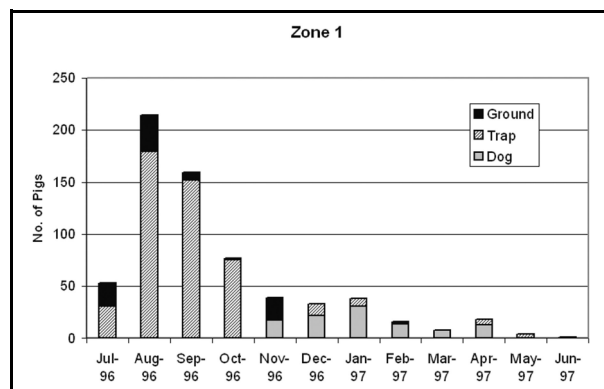


Figure 2. Number of pigs removed from Zone 1 by each method during the eradication effort. Three additional pigs were removed from August 1997 through January 2000, all with use of dogs. Four pigs were taken by helicopter in January 1997 and are included in the ground method total.

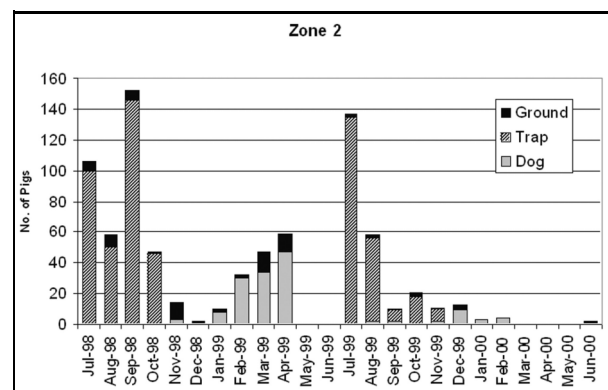


Figure 3. Number of pigs removed from Zone 2 by each method during the eradication effort. An additional 36 pigs were removed from July 2000 through December 2002, nine by ground, five with traps and 22 with dogs.

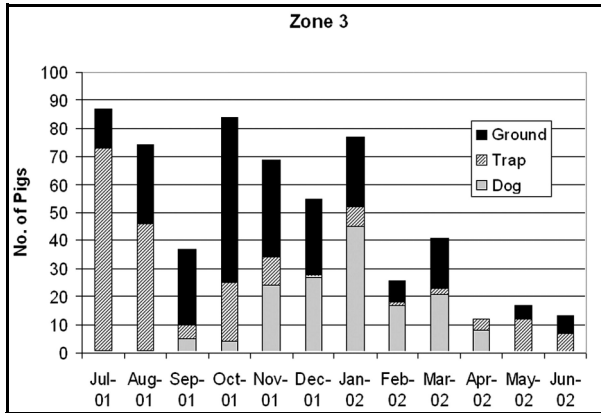


Figure 4. Number of pigs removed from Zone 3 by each method during the eradication effort. An additional 67 pigs were removed from June 2002; 15 by ground, 11 with traps and 41 with dogs.

six pigs were removed from Zone 2 and 106 from Zone 4.

Since we initiated operations in a new zone while a few pigs still remained in the previously worked zones, it was necessary to return to each zone on a periodic basis to search for the remaining individuals. Removing the hunting pressure when densities were extremely low provided an opportunity for the pigs to resume a regular pattern of behavior after being hunted for an extended period. These “revisits” generally consisted of single project member who either worked the zone alone on foot or with dogs. If pigs or sign were observed, the area was revisited by a group of hunters (generally with dogs) to attempt removal of the animals. It was necessary to use this procedure a number of times in each zone, as it became increasingly difficult to detect and dispatch the last few remaining pigs in any zone.

DISCUSSION

Each of the four zones had particular characteristics (size, topography, vegetation type) that provided different challenges for feral pig removal. In addition, both the number of field personnel on staff when a particular zone was being hunted, and the social/political atmosphere at the time, influenced how specific removal techniques were employed and the rapidity in which the zone was cleared of pigs. The following provides a detailed discussion of how eradication in each zone was approached.

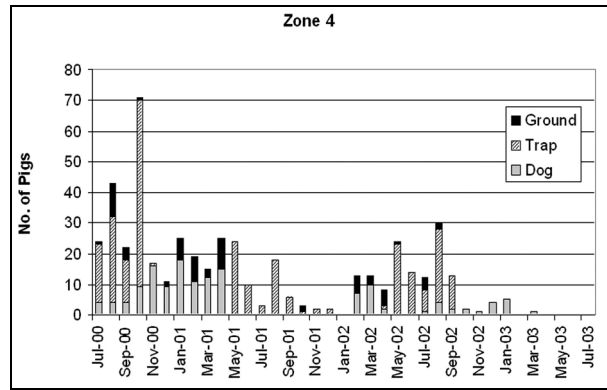


Figure 5. Number of pigs removed from Zone 4 by each method during the eradication effort.

Zone 1—The results of the eradication effort in Zone 1 followed a steady decline to near zero, indicating that a number of factors were favorable to complete the removal in a timely fashion. These factors included the ability to saturate the area with traps during the summer months and having a sufficient number of personnel available for the size of the zone being worked. While Zone 1 was only 33% smaller than Zone 2 in overall size (3,492 vs. 5,238 ha), the majority of the pigs occupied the oak woodland/chaparral and grassland habitats on the north side of the zone. The steep and rocky south side of the zone was predominantly relic coastal sage habitat with considerable cactus. This habitat type did not appear to be used to any significant degree by the pigs; thus, the vast majority of the pigs were removed from only 60% of Zone 1, an area that was only 40% the size of Zone 2. Due to the relatively small area of the zone occupied by the pigs, the area was effectively worked using only two full-time employees. By starting to trap in summer when pigs were most likely to enter traps, and by saturating the north side of the zone with traps, the majority of pigs were removed using this technique. Trapping efforts was followed with the use of dogs and opportunistic hunting, the combination of which removed all but a few of the remaining animals. As with all zones, the last individuals in Zone 1 were killed over the next several months as detections were made.

Zone 2—Work in this zone was conducted with a crew of four hunters. Unlike the situation in Zone 1, pigs were distributed more uniformly in Zone 2. Due to the number of available traps it was

not possible to saturate the entire zone with traps. For this reason there were still a large number of pigs present after the initial 1998 trapping season, which was indicated by the high number of pigs removed by the use of dogs after trapping ended (Fig. 3). When trapping recommenced in July of 1999 there was a spike in the number of pigs removed. These animals included both the residual pigs present after the first year and those ensuing from subsequent reproduction. After the July through November 1999 trapping effort, the pig population in Zone 2 had been severely reduced and the remaining animals were taken with the use of dogs and ground hunting by June of 2000.

Zone 3—Zone 3 was the largest of the four zones. The use of the various removal techniques differed somewhat in this zone due to the greater number of staff (6–7 people) available to work in this area. While we still initiated the work in this zone with trapping, a large number of pigs were concurrently killed using ground hunting. With more project personnel working in this zone, traps could be checked and cleared in the morning while still giving time for ground hunting efforts. The same was true when dog hunting commenced, as there was ample opportunity to ground hunt after or before using the dogs on any particular day. Another factor that contributed to the greater use of ground hunting was the accessibility of project personnel to that zone. Living quarters for project staff were located within Zone 3, and therefore pigs could be opportunistically dispatched if any were observed while project personnel were involved in other activities (such as going to or from the city of Avalon). Therefore, while we applied the same pattern of using traps first during the dry season, followed with the use of dogs to locate pigs, the larger number of personnel allowed for greater use of ground hunting techniques in this zone.

Zone 4—This zone presented the greatest number of obstacles and challenges to our eradication efforts. The town of Avalon, with approximately 5,000 residents, is located within Zone 4. In addition, a large number of tourists visit the town, especially during the summer months. The City Council administers permits pertaining to the use of firearms within the city limits, and we were denied a permit to discharge weapons of any kind, including tranquilizing rifles or crossbows.

Unfortunately, the city limits extend approximately 2 km outside the area occupied by residents and into habitat occupied by the pigs. Given these constraints, we were compelled to employ other methods of pig removal within the city limits in conjunction with traps. The Conservancy dictated that all pig carcasses be removed from the zone to prevent any potential problems with offensive odor or with the hatching of flies on carcasses. This added additional time to haul all carcasses out of the canyon.

The decision to delay the initial trapping effort in Avalon Canyon until after the visitor season at the end of October 2000, allowed only about three weeks of successful trapping effort. While 60 pigs were trapped during that three-week period in October 2000, subsequent trapping efforts resulted in limited success due to the availability of a large acorn crop. The brief trapping season left a large number of pigs remaining in Avalon Canyon. The subsequent attempts to remove pigs in Avalon Canyon with the use of dogs resulted in the movement of many pigs to previously cleared areas outside Avalon Canyon, and required that area to be hunted again. As we were prevented from discharging firearms, we used a “catch dog” to hold pigs so that project personnel could safely approach larger pigs and dispatch them using non-projectile weapons (e.g., knives). When using dogs we initiated the hunts from the bottoms of the draws so that pigs would more likely be pushed outside the city limits rather than toward the city. We also positioned hunters at the tops of canyons outside the city limits who could spot and dispatch pigs fleeing from the dogs and other ground hunters.

Our final obstacle to working in Zone 4 was vandalism of our traps. Because of the proximity to Avalon, traps within this zone were more often vandalized (e.g., parts removed or broken, animals released) than in other areas on the island. This caused setbacks in the program and increased the time necessary to complete the removal.

Application of Eradication Methods

Planning for eradication of exotic species requires incorporating a variety of techniques and having the flexibility to implement those techniques as necessary. Furthermore, it is important to be able to interject contingency measures when conditions

merit. The ability to adapt the methods being employed to changes in animal density, weather conditions, access restrictions, food availability and the social/political climate are critical to a successful eradication program. Lack of local community support, even from a small group, can lead to significant setbacks in an eradication program. On this project, holes were cut in fence lines, vehicle and pedestrian gates were left propped open, traps were vandalized, and there were rumors of translocation of pigs into zones previously cleared of pigs.

Fencing—The use of fences to create discrete zones provided the ability to start and stop removal activities within a zone with little concern regarding the possibility of ingress by pigs. For the Conservancy, the presence of the zone fences provided a degree of “insurance” against losing ground in the eradication effort if legal challenges or funding shortages delayed the program. While the use of zone fences made the removal of pigs much easier to accomplish across the island, they required frequent monitoring to ensure that breaches (either due to natural events or vandalism) were quickly detected and repaired.

Trapping—In circumstances where eradication work is being conducted in a vegetatively complex environment, we believe it is beneficial to initiate efforts with the use of trapping. Pre-baiting of the traps greatly increased capture success and provided for a greater percent of multiple captures during the first days of trapping. Bait consumption tends to increase over time at the bait sites, especially during the summer, likely due to increasing numbers of pigs discovering the bait (McIlroy et al. 1993, Saunders et al. 1993). As they become habituated to the presence of bait, increasing numbers of pigs begin to visit the traps and this increases the probability of multiple captures when the traps are finally set.

Initial placement of traps may require considerable effort, but the ongoing effort to maintain the traps and the cost/benefit in relation to the number of pigs removed is greater with this technique than with other methods. Traps placed near roads or trails can be baited with minimal effort and corral-type traps can capture multiple pigs in a single evening. Use of traps is most effective when pig densities are high and during the time of year when natural forage is at a

minimum. During these periods, pigs are attracted to bait and are more easily captured. As pig density declines, use of scent attractants can be beneficial for alerting the pigs to the presence of the bait. Traps equipped with automatic bait dispensers can be used in more remote sites to reduce travel time when pre-baiting. As mentioned previously, traps can also be equipped with telemetry transmitters to reduce the effort involved in checking remote traps, as project personnel know in advance if a trap needs to be checked.

Aerial hunting—If the landscape is more open, such as with grasslands, aerial hunting can be an effective means of quickly and efficiently reducing pig numbers (Hone 1990, Dexter 1996). However, this technique becomes less effective as the complexity of the landscape increases (e.g., a greater shrub or woodland component) allowing animals to stay in or escape into cover as the helicopter approaches (Hone 1990, Garcelon, unpubl. data). This technique becomes exponentially less effective as pig density reaches a certain minimum threshold (Choquenot et al. 1999). Hunting from a helicopter can also draw more unwanted attention to an eradication effort, as the public may view the use of helicopters as an ‘inhumane’ or ‘unfair’ means of hunting the animals, despite the fact that the goal of an eradication effort differs significantly from sport hunting. On Catalina, except for Zone 1, we did not hunt pigs from a helicopter during the eradication program, both due to the closed nature of the habitat and perceptions of the local community.

Dogs—Dogs are used widely in both control and eradication efforts of feral pigs (Caley and Ottely 1995). When attempting to remove the last pigs from a zone, dogs are a vital asset as they are capable of finding the pigs by scent alone. Another advantage of using dogs is that the technique does not require that the pigs respond or behave in any particular way (e.g., go to a trap or bait), so dogs can be used to pursue pigs that might be avoiding traps or that have a home range containing no traps.

Typically, only two dogs were taken out per hunter and each hunter worked a different area to avoid having a large group of dogs chasing the same pig. However, when pig density was low, groups of hunters and multiple dogs were used in a coordinated hunting effort. During these coordi-

nated hunts, spotters were often positioned at high points in the area being worked in an effort to either direct other hunters or to shoot pigs as they appeared in openings. The use of handheld two-way radios was critical in coordinating activities among dog handlers and spotters during these group hunts, as it was important to always be aware of where each hunter and dog was located. Extreme caution must be used when multiple hunters are working in closed habitats, both for the safety of the hunters and the dogs. High visibility colors should be worn by hunters and dogs alike to increase safety when group hunts are being conducted.

Various dog breeds and hybrids are used in hunting feral pigs. Depending on the type of situation, one breed may have qualities that are superior to another. Some breeds, such as hounds, are capable of following an older scent trail and therefore may follow a track for several miles. Most hounds bark while following a fresh pig trail. Other breeds, such as catahoulas, mountain curs and black-mouth curs, may not have as sensitive of a nose and will vocalize and 'bay' (corner) larger pigs when located, as well as capture small pigs. Finally, a 'catch dog' (e.g., bull dog, dogo) is capable of subduing even large pigs and holding them until the hunter arrives. On Catalina, this type of dog was especially useful within the city limits of Zone 4 where firearms could not be used.

Ground hunting—The various types of ground hunting used during the eradication (opportunistic, spotlighting, shooting over bait, night vision shooting) were all important components of the removal program. When pig densities are high, opportunistic ground hunting, especially in open habitats, can account for the removal of a high number of pigs (Lombardo and Faulkner 2000). When pig numbers are low, ground hunting plays a vital role in removing the last individuals, as these remaining pigs may come to bait at night or be opportunistically caught in the open during the daylight or twilight periods and dispatched by gunshot.

Although many pigs were removed using .223 caliber rifles, we recommend the larger caliber rifles such as .270 and .308 because of their heavier bullets and greater down-range performance at longer distances. After shooting several thousand feral pigs with the solid copper bullets, we have

found them to be very effective in making humane kills, while negating the risk to scavengers by leaving lead in the environment.

FUTURE ACTIONS

In order to ensure the successful eradication of pigs on the island, a plan has been developed to systematically survey the entire island for the presence of any remaining pigs. This protocol will be implemented for a minimum of two years after the last known animals have been dispatched to ensure total removal has occurred.

The plan consists of subdividing the island into 252 small sections, ranging from 26–192 ha, using fence lines, roads, ridges, and other distinct topographical features. These sections are small enough to be thoroughly scouted in 2–5 hours depending on topography, vegetation, and size. We search for any tracks, scat, rooting or any other evidence of pigs in each section, while focusing their efforts on areas more likely to have pig presence such as creek beds, grasslands, and under oaks. Time required to scout each section is recorded with the date. Helicopters will be used to search for pigs and rooting in the spring months when disturbance to vegetation is more visible.

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