

REESTABLISHMENT OF NATIVE FLORA AND FAUNA IN
HAWAII VOLCANOES NATIONAL PARK

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Hawaii Volcanoes National Park is the largest single land unit in Hawaii whose management policy is primarily devoted to the perpetuation and maintenance of the primitive Hawaiian scene. Objectives guiding the management of the park's biological resources pertain to the preservation and restoration of native ecosystems. A resources management program has been developed to favor native ecosystems and minimize the effect of non-native invaders. Guidelines for this program are set forth in the park resources management plan.

Relative to this plan, I would like to address three aspects of resources management: 1) what is the goal of resources management in Hawaii Volcanoes National Park, 2) what has been the progress since the park was established, and 3) what programs are underway or planned.

What is the goal: We often speak of "preserving and restoring native ecosystems" as being the primary purpose or objective. But, exactly what does this mean? Everyone here probably attaches a little different meaning to this concept, depending to some extent on his or her special interest. However, I think most would agree that Hawaii Volcanoes should be a natural preserve where ecosystems are maintained as nearly native as possible. Where the influence of non-native organisms is minor. Where native plant communities flourish, supporting a broad array of native insect and birdlife. Where species native to the region are not unnaturally rare or threatened with extinction. Where natural processes associated with native biota are operating as free as possible from man's direct or indirect influence. This is the goal.

Unfortunately, at this point in time the park does not meet these criteria, hence the need for a resource management program. Some persons might say that this goal can in reality never be achieved in light of the many adverse factors operating against native ecosystems. While this may be true, does this mean we should abandon the goal? Certainly not! For if we can come anywhere near this goal, the effort will have been worthwhile. Because in so doing at least a semblance of Hawaii's unique native resources will have been saved and maintained. The importance of these resources will continue to grow as, almost inevitably, native biota declines elsewhere in Hawaii.

What has been the progress since the park was established: The park was established in 1916. Through the years land additions have been made and today it is about 220,000 acres in size, ranging from over 13,000 feet elevation to sea level grading from rain forest to desert. The area which became Hawaii Volcanoes National Park was far from being a pristine Hawaiian scene in 1916. At least 75 years of destruction by cattle, goats, pigs, non-native birds and insects had gone before. Even Bird Park, considered to be a botanical treasure, was lacking understory vegetation as a result of extensive browsing by cattle.

It is not unreasonable to assume that native plants, birds, and insects had already disappeared; some perhaps even became extinct. We can never know what the original native character of the area was. Under park management the area gradually began to change to the benefit of native flora and fauna. Cattle were removed from Bird Park; grazing permits were eventually discontinued on the Mauna Loa Strip. Some of the rarer native plants were propagated. *Hibiscadelphus giffardianus* was saved from extinction. And in the early 1970's an effective goat reduction began. These were the highlights of resources management during the last 60 years, but even with this I believe that native ecosystems throughout the park in general continued on a downward trend. A truly effective program was slow in coming. I sense now, however, that the tide has begun to change and indications are that progress towards the goal is going to accelerate.

What programs are underway or planned: Continued goat control and completion of boundary fences is still the number one priority. The population has gone from an estimated 15,000 in 1970 to 300 today. As remaining segments of boundary fence are completed, this number should be further reduced.

Feral pigs pose a major problem. Damage has certainly been alleviated in accessible areas but there are thousands of acres still receiving incredible abuse from these animals. Now that goat control and related fence construction becomes less of a burden, more attention is going to be focused on pigs. Presently we are experimenting with control methods to determine how we can best wage an effective and long lasting reduction program.

Next, there are several exotic plants that we must keep from getting out of hand. These include: fire tree (*Myrica faya* Ait.), ʻēkoa or koa-haole (*Leucaena leucocephala* [Lam.] de Wit), silky oak (*Grevillea robusta* A.Cunn. in R.Br.), Christmas berry (*Schinus terebinthifolius* Raddi), banana poka (*Passiflora mollissima* [HBK.] Bailey), and a few others deemed to be highly competitive with dominant native ecosystem species. Some work has been accomplished through the years but beginning this year this program will be substantially increased.

There are over 400 exotic plants inhabiting park ecosystems. Much research is needed to tell us which pose problems to the native ecosystems and what techniques are best for their control or elimination.

The program I have discussed so far is aimed at extracting grossly interfering elements from the ecosystem. In many areas of the park, this is perhaps the only type of resource management action necessary. However, in some areas-- particularly the coastal regions from 'Āina-hou to Ka'ū boundary, which have suffered extensive damage and alteration --merely removing the non-native elements is not enough.

Therefore the park has developed a native plant restocking program. The purpose of this is not to create a large botanical garden, but rather to do the following:

1. Provide native plant competitors for exotic plants. This is a technique for the control of exotic plants which is often more effective than mechanical removal. Without goats, natives can often compete successfully with exotics if they are given a helping hand.
2. As a result of past goat and cattle devastation, many plants once common are rare. Some of these need attention where there is little likelihood that they will reestablish themselves on their own. Even with goats gone, some are yet ravaged by insects and rats and until programs can reverse their continuing decline the park must artificially supplement the natural population.
3. Planting can be useful in restoration of habitat for native birds. It is presumed that the decline of certain key plant species have been instrumental in the disappearance of native birds. We are concerned at this time primarily with the 'Alalā and Nēnē but perhaps further research will pinpoint other birds which can be assisted in this way.

The reintroduction of plants into their former range will not be done on a wholesale basis. Certain restrictions are included in the resources management plan so that hybridization does not occur and genetic pools are not altered:

1. Only species known to have or strongly suspected of having occurred in the park will be used.
2. Propagating material sources must come from the nearest stock available.
3. Complete records must be kept and plantings must be periodically monitored to gauge success of the program.

4. It would also be valuable if a biological inventory could be made of each planting area for comparison studies in future years. It would be important to know how plantings influenced native insects, birds, and how they compete with exotic plants.

The concept of reintroduction of plants also holds true for some bird species. Nēnē formerly occupied the lowland habitat, migrating there from the uplands for breeding purposes. It is unlikely that Nēnē would reoccupy these areas on their own even with the best vegetation recovery plan. We now have eight breeding enclosures from 'Āina-hou to Kū-ka-lau-'ula. There is much to be learned from this project, such as ways to control mongooses and feral cats and Nēnē requirements for native food plants. We have high hopes that a substantial Nēnē population can be reestablished to survive and perpetuate itself in the wild.

Another bird formerly occurring in the park is the 'Alalā (Hawaiian crow). Many concerned people feel this may well be the next species to be added to Hawai'i's long list of extinct birds. We have recently prepared a captive-breeding-reintroduction program and are prepared to commit park resources to implement it. We are presently seeking U. S. Fish and Wildlife Service approval.

It is an understatement to say that we don't have all the answers. An enormous amount of management-oriented research is needed. It is encouraging however to note that many such studies are now underway, several of which are being reported on at this conference. These will provide important information on which to base future management decisions.