Non-native Deer Management: Frequently Asked Questions
Point Reyes National Seashore
June 2008

1) What is going on with the non-native deer at Point Reyes National Seashore?

The park is managing non-native deer with a combination of an experimental contraceptive treatment and lethal removal in order to eventually remove all non-native deer over the next 16-20 years. The Seashore began implementing the plan in the summer of 2007. As animals are removed, meat will be donated to local charities and to the California Condor Recovery Program. Wildlife professionals, trained specifically in capturing and removing animals in a quick and humane manner, will carry out the work.

2) What's the problem with non-native deer?

Park scientists have found that the non-native deer have several serious impacts on Seashore ecosystems. The most important of these impacts can be summed in the following ways :

a) There is increased competition with native tule elk and black-tailed deer for certain types of food. Both axis and fallow deer have been shown to adapt their feeding habits during droughts or times of low forage availability, to the same foods that native black-tailed deer use exclusively and year-round. Deer eat upwards of 3-4% of their body weight in forage each day. Consequently, 1-2 tons of forage is being removed by non-native deer every day and is no longer available to native deer and other native species. Forage in the Seashore is limited and increased competition will negatively impact black-tailed deer populations.

b) Non-native deer have been shown to carry non-native organisms known to cause fatal disease in both tule elk and black-tailed deer (e.g. paratuberculosis and pediculosis). Paratuberculosis, a wasting diarrheal disease of ungulates, has been diagnosed in 8%-9% of axis and fallow deer. In 2005, USDA researchers discovered a species of exotic louse in Seashore fallow deer which has been documented to cause fatalities in northern California and Washington black-tailed deer.

c) During the fall mating season, or rut, male fallow deer establish areas known as "leks" near streams or in oak woodlands, where they display to potential mates. This behavior is unique amongst deer, but it is similar to breeding systems used by grouse. A fallow deer lek typically includes males displaying in an area of about 100 - 150 square meters. Using its hooves and antlers, each male clears away most or all of the vegetation and digs a pit up to 0.6 meters deep which he defends throughout the breeding season. The damage caused resembles feral pig damage but with more soil compaction than upheaval. Leks cause damage to soils, water resources, and vegetation. They indirectly harm the species which depend on these habitats. Damage near waterways can impact federally endangered and threatened species such as Coho salmon and California red-legged frogs.

3) Did the public have any input in the deer management plan?

The Seashore's management plan is the result of 5 years of consultation with the public, biologists and contraception experts nationwide. The 431-page Environmental Impact Statement

(EIS), entitled *Point Reyes National Seashore Non-Native Management Plan: Protecting the Seashore's Native Ecosystems*, carefully analyzed a range of action alternatives, ranging from no action to removing all non-native deer from the park. This document is available online at: http://www.nps.gov/pore/parkmgmt/planning_nonnativedeermanagementplan_final_2006.htm.

The public input process for the plan consisted of a two-month public "scoping" period in 2002 to raise issues to be considered in the plan, and, a two-month public comment period for review of the draft plan in 2005. During the comment period, NPS received 1,980 pieces of correspondence (including letters, emails, facsimiles and hand-delivered comment forms). All comments were reviewed and carefully considered.

4) Where do the non-native deer come from?

Fallow deer (*Dama dama*) are native to Asia Minor while axis deer (*Axis axis*) originate from India. In the 1940s and 1950s (before establishment of the Seashore in 1962), a local landowner bought surplus axis and fallow deer from the San Francisco Zoo and released them on the western slope of Mount Vision for hunting purposes. Their numbers increased until they reached an estimated total of 900-1100 deer in 2002.

5) Why can't the Seashore just use contraception to control the deer?

The NPS has consulted with leading experts in wildlife contraception across the U.S. and the overwhelming consensus is that contraception alone would not control non-native deer in the Seashore. There are too many deer and they are too difficult to access. They occupy at least 50,000 acres, much of which is in wilderness, without road or trail access. In the past, wildlife contraceptives have not lasted more than a year and have required annual "boosters", via dartguns, to remain effective. As Seashore biologists learned in a 6-year contraceptive trial with tule elk (from 1994-2000), wild deer learn to avoid being re-treated and each booster becomes increasingly more difficult over the 10-20 year life of a deer. Currently, contraception as a stand alone population control method for deer is only practical in small, enclosed populations such as those on islands or in zoos.

6) Why can't the Seashore move the deer to a zoo or private ranch?

A number of alternatives for controlling the ecological impacts of non-native deer were considered by the park but dismissed because they were not feasible. One of these alternatives was to relocate deer outside of the Seashore on the lands of willing private or public owners. Paratuberculosis, or Johne's disease, and the presence of exotic lice have been documented in Point Reyes non-native deer. Johne's disease is a chronic, incurable and transmissible diarrheal disease of domestic and wild ruminants. Carriers can shed the organism sporadically and Johne's disease can be difficult to diagnose in infected deer. The non-native lice found on non-native deer at PRNS have been shown to cause death in native black-tailed deer in the Pacific Northwest. Because of the difficulty of accurately screening deer for Johne's disease or lice, and the infection risk that carrier animals would pose to livestock, farmed deer, and other wildlife, California Department of Fish and Game has communicated to NPS that movement of non-native deer to other parts of the state is undesirable.

7) What kind of contraceptive is the park using on non-native deer?

Current wildlife contraceptive technology is not advanced to the point where effective contraceptives are commercially available. The Seashore, in cooperation with researchers in the US Department of Agriculture, is currently testing an experimental drug with the potential for multiple-year effectiveness on 80 fallow deer females. This drug, GonaCon™, is a vaccine which, when injected into the hind leg of a female deer, renders the animal immune to one of the naturally produced hormones required for pregnancy. Previous studies on GonaCon™ trials with another species of deer indicate that the drug may prevent pregnancy for up to 4 years with just one treatment. Because the drug is a protein, it is broken down in the digestive tracts of scavengers and therefore there are no impacts to other animals in the food chain. In the summer of 2007, Park Service and contractor staff treated fallow deer that were captured under drop nets or with sedative darts. The park's GonaCon™ project is one of the largest contraceptive trials on free-ranging deer in the U.S.

8) Do the non-native deer harm our native deer?

Yes. U.S. Geological Survey scientists believe that, based on overlap between the foods that native and non-native deer eat, for every 2-3 nonnative deer, we are losing 1 native deer. At current levels of non-native deer, there is a 46% reduction in black-tailed deer population. Additionally, the non-native deer have been shown to carry diseases known to be fatal for tule elk and black-tailed deer (paratuberculosis, a diarrheal wasting disease, and pediculosis, infection with an exotic louse).

9) How many deer have been treated with contraceptives or culled so far?

As of February 2008, approximately 80 fallow deer have been treated with contraceptives, and approximately 150 axis deer and 520 fallow deer have been culled.

10) What happens to the deer that are culled?

Over 75% of culled deer have been donated to food banks, soup kitchens, Native American tribes, or California Condor restoration programs throughout the state.

11) Is the Park Service supervising the culling of non-native deer?

The contractor's capture and culling operations are continuously observed by NPS staff and have been found to be, without exception, safe and humane. The contractor has years of experience in humane capture and culling of wildlife in suburban and urban areas where safety is a predominant concern. The NPS contract specifies that the contractor will comply at all times with the American Veterinary Medical Association's and the Marin Humane Society's stated guidelines for humane euthanasia. The contractor has strictly adhered to those recommendations.

12) Why doesn't the Park Service leave a small herd of non-native deer in the park?

During 5 years of environmental analysis, NPS considered the option of retaining smaller populations of axis and fallow within the Seashore. This option was not chosen for several reasons:

a) Populations of both deer species have the capacity to grow very rapidly, as much as doubling their numbers every 4-6 years. Control would have to be carried out forever. Since contraception has not proven to be effective for controlling large populations of free-ranging wild deer, lethal culling would be necessary. Lethal culling in perpetuity would result in thousands of deer culled. In fact, models developed for the NPS by population biologists suggest that up to 10,000 deer would be killed by 2066 if control, and not total removal, were the goal.

b) Controlling deer in perpetuity would require immense resources. It is estimated that controlling both populations to 350 individuals of each species, using both culling and contraception, could cost $13 million by 2066. Such funds are not currently available to the Seashore. In addition, controlling non-native deer would require re-allocation of Seashore staff time away from other priorities, such as endangered species protection and other native species management. These priorities would suffer as a consequence.

c) Controlling non-native deer would reduce impacts to native ecosystems but not eliminate them. Point Reyes National Seashore is mandated by its own enabling legislation to administer its lands "…consistent with, based upon, and supportive of the maximum protection, restoration and preservation of the natural environment within the area." Preservation of non-native deer, and their ongoing damage to the Seashore ecosystems, is not in keeping with the purposes for which the Seashore was established.

13) If the non-native deer have been here for 50 years, why is it important to remove them now?

Because of the rapid population growth and expansion of non-native deer towards and beyond park boundaries, park managers are concerned that large numbers of breeding females could soon be beyond NPS control. If this happens, nonnative deer expansion over the rest of Marin County will be irreversible and the damage found in the Seashore will occur over larger and larger areas.

Axis deer populations can double every 4 years, and 4-month old fawns have been found to be pregnant. Fallow deer populations can double every 6 years. At their current densities, non-native deer eat over 1 ton of forage each day that is consequently not available to native species.

The window of opportunity for controlling the non-native deer is closing. If NPS does not act now to control fallow and axis deer, they will continue to expand beyond park boundaries onto private and other land. Once outside the park, control will be difficult or impossible.

14) If the non-native deer have been here for 50 years, aren't they considered "native"?

It took much longer than 50 years for the native species in the California ecosystem to evolve together and form the ecological webs and landscapes you see today at Point Reyes National Seashore. The crucial distinctions between natural evolution of native species and introductions of non-native species is the time scale over which it occurs and lack of human manipulation. A species of plant or animal is generally considered to be "native" if it occupied or migrated to an area over this long period of evolutionary time. The evolutionary timescale is on the order of

thousands of years. Fifty years, the length of time during which non-native deer have lived in the area, is a fraction of the time required by most species (particularly long-lived ones) to co-adapt and co-evolve. The distribution and migration of a species is considered to be a natural occurrence if it occurs without the intentional or inadvertent influence of humans. Native species inhabiting the national parks either co-evolved at that location over millennia or migrated there over time.

Axis deer and fallow deer both evolved, over many thousands of years, in India and Asia Minor, respectively. In their native ranges, the vegetation, wildlife and other living species co-evolved with them, to form a stable ecological balance. None of the species present in the natural California coastal ecosystem evolved with axis and fallow deer or appear to be dependent on them in any way. However, the ways in which non-native deer affect native ecosystems are numerous but subtle. Unlike native black-tailed deer, they congregate in massive herds and cause compaction and erosion of soils, denudation of vegetation and damage to woodland and riparian habitats. The species which depend on these areas, including species of concern and migratory birds, are in turn adversely impacted by a loss of habitat. Non-native deer compete with native deer for food and cause decreased survivability of black-tailed deer in the fall and during droughts.

Because of these impacts to native species and the physical structure of the California coastal ecosystem within the Seashore, the National Park Service is mandated to control the non-native deer.