

San Juan Island

National Historical Park
Washington
National Park Service
U.S. Department of the Interior

The Rabbits of American Camp

After human beings, the most dominate creatures on San Juan Island are the European rabbits. They root and burrow in isolated pockets throughout the island, but are most prominent on the more arid southern extremity.

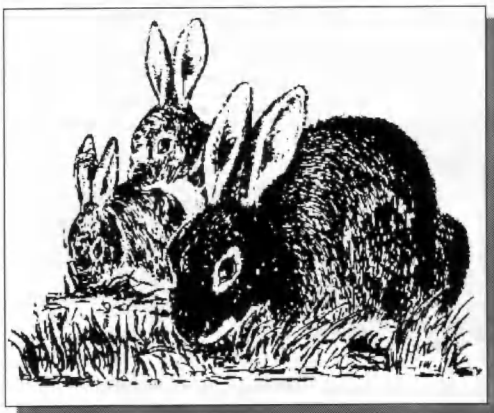
Aspiring breeders introduced rabbits to the island sometime between 1872 and 1895, after soldiers and settlers had cleared large tracts of land for military camps used during the joint occupation (1859-72), trading posts and farms. Oral tradition has it that the breeders went broke and released the critters before leaving the island. The rabbits so quickly took to the cleared farmland and open prairies that they became a common sight by 1895, and the dominate plant-eating animal by the 1930s.

Today, there are about 1,000 rabbits per hectare (2.47 acres) in the vicinity of American Camp. They are prime examples of what can happen when an exotic species is introduced into an environment where natural controls are not enough to hold the population in check.

Origins

The European rabbit is a true rabbit because, unlike a hare, it is born naked and remains dependent upon the mother for several weeks after birth. European rabbits also are unusual because they are colonial, meaning they are continually expanding their territory through extensive burrow systems called "warrens." The species, *Oryctolagus cuniculus*, evolved on the open, rocky moors of Spain, where it was discovered by ancient

Phoenicians, who marketed the animals throughout the Mediterranean basin. Selective breeding over the centuries led to domesticated Flemish giants, as well as Dutch and English breeds. The breed is so resilient that once returned to nature, it literally goes wild. This is the same creature that plagued England for more than



1,000 years and continues to be a serious economic threat to Australia and New Zealand. Each country spends millions each year in unsuccessful attempts to bring rabbits under control.

Rabbit Archipelago

The European rabbit lives throughout the San Juan group, most prominently on portions of San Juan, Orcus, Lopez, Shaw, Brown, Waldron and Matia islands. The breed also has overrun several islands on Puget Sound, in the Aleutian chain and the Channel Islands near Santa Barbara, California. As on San Juan, in almost every instance the rabbits thrive on prairies but do not do well in the forested areas.

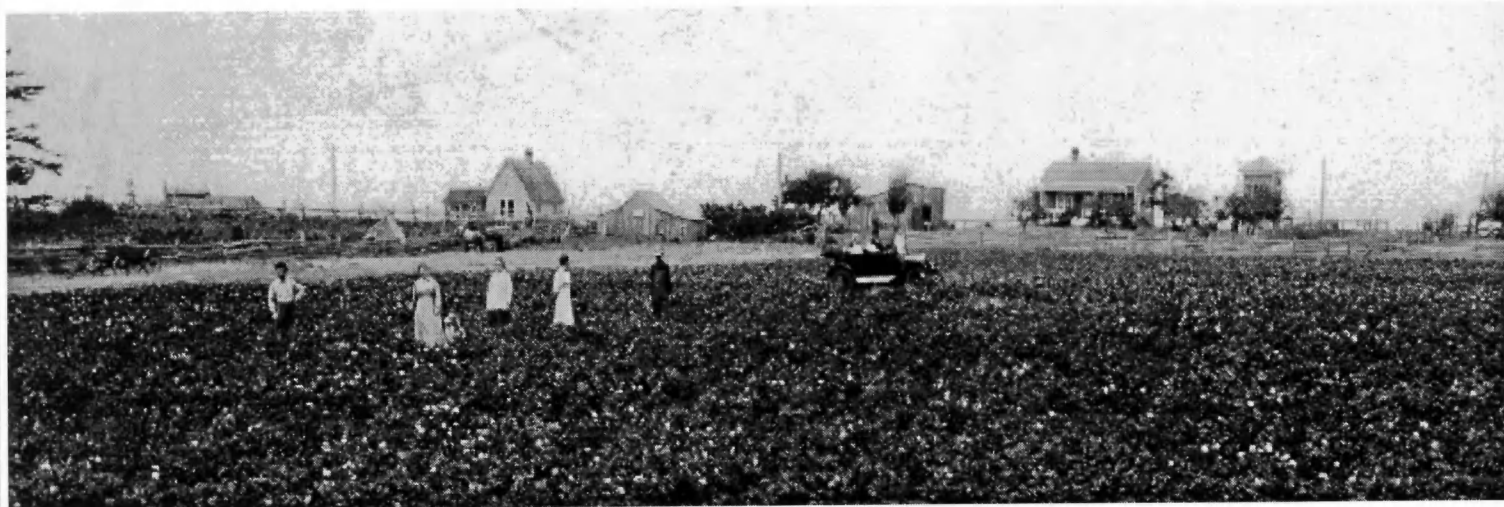
Rabbits Redux

The rabbit's reputation as rapid and multiple breeder is no myth. Virtually every mating guarantees a pregnancy. On San Juan Island, rabbit reproduction begins in mid-March. After mating and a 28-day gestation period, six to nine young are born. Within 24 to 36 hours after giving birth, the cycle repeats itself up to three litters per year. (Females of this species in Europe have been known to produce up to seven litters per year.)

After three-weeks in the burrows, the kittens emerge and immediately start foraging on grasses and the bark of shrubs and trees, but continue to nurse for one more week. When the birth of the next litter is imminent, the kittens are on their own. But they leave the security of the burrow with all the defensive mechanisms required for survival above ground. When the second litter is born, the first litter (or older kittens) return to the larger chambers of the warren — especially where tunnels join. From here they continue to emerge for foraging several times a day. Growth is rapid. At two months they are three-quarters of adult weight. By three months they are fully mature and capable of breeding.

However, few on San Juan breed during their first year. Experts believe this a local survival measure to keep the population down. European rabbits — principally aggressive adults — also are known to force the young and the weak out of crowded burrows by mid-July and August. The runts either perish in the winter, recolonize abandoned warrens or dig new ones nearby.

The result is that while many rabbits may be born during a breeding



Amercian Camp (looking north) as a farm, circa 1900. The rabbits thrived on the cleared acreage.

season, only a few actually survive to become permanent residents. Yet, even with these built-in controls, the rabbit population continues to expand at American Camp. And this, coupled with the rabbits' engineering skills, is creating havoc on park resources, such as Robert's Redoubt, the earthen fortress located on the rise just east of the parade ground.

Warrens

The European rabbit is the only rabbit species that constructs an extensive system of burrows with interconnecting tunnels and chambers. These "warrens" — a good example is most easily seen on

wide (10 by 15 inches). Any spot along a tunnel or chamber may be used for resting. When the females seek seclusion to give birth, they take over the side chambers out of the line of traffic.

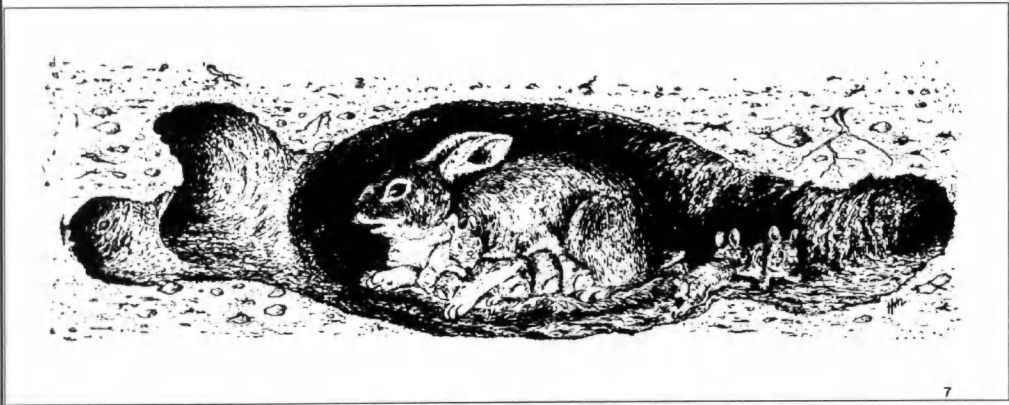
The sizes of the warrens are constantly changing because of the action of the weather and digging by the rabbits. Erosion by wind and rain may eventually cover entrances and cause collapse of tunnels. From time to time the rabbits open up some of them again and abandon others. In a year's time, the rabbits of a larger warren may dig 20 meters (66 feet) of burrows or they abandon it altogether and start another one nearby.

within reach. Like all herbivores, they have developed adaptations to extract the most nutrients from their food. One of these is the ingestion of certain fecal pellets produced once or twice a day, enabling the rabbit to extract more nutrients from food that already has passed through the gut. They swallow these pellets whole as humans would vitamin tablets. In Australia, five rabbits can eat as much grass as one sheep. On San Juan, few deer live around the warrens because the rabbits consume most of the food and eliminate reproduction of low-growing trees.

Predators

However, a combination of checks and balances keep the rabbits from occupying every square foot of ground on the island. At American Camp as many as eight varieties of raptor species possibly feed on rabbits, the most common among these bald and golden eagles, red-tailed hawk and great horned owl.

The rabbits are also pursued by red fox (introduced to the island in recent years), ferrets, raccoons and some dogs and cats.



The warren is the multi-burrowed hub of life for the San Juan rabbits

the American camp interpretive trail, southwest of the Redoubt — require years of digging and regular maintenance. In fact, it may have taken 10 to 15 years to dig the larger warrens at American camp, some of which are estimated to be more than 30 years old.

Above ground, entrances may number from 1 to 60. The average is about nine. The surface area occupied by a warren is about 777 square meters or about one-fifth of an acre. Underground, a warren may contain from 90 to 150 meters (295 to 492 feet) of burrows and shelter as many as 100 rabbits during the peak of the breeding season. The larger side chambers and places where tunnels come together measure about 25 centimeters high by 38 centimeters

Family Life

The warren is the home and hub of life. For a rabbit family it is warmth, refuge and safety from adverse weather and roaming predators. It is also a world where strength is paramount. The strongest male is dominant over all other males in a pecking order down to the weakest. During breeding season the strongest has his pick of the females and may occasionally select them all. The female hierarchy is comparable, with the dominant female having her choice of the males. The dominant pair, in turn, have first pick of the best burrows in the warren and the choicest feeding spots in the home territory.

Rabbits are strict herbivores and capable of eating almost every plant

Viewing Rabbits

Hiking the History Loop trail at American camp takes the visitor directly through rabbit country. It is important to view the rabbits passively so as not to disturb them, their predators and other wildlife in the area such as foxes, skylarks, sparrows, killdeer, meadowlarks and other species. Also, watch out for rabbit holes along the trail and keep dogs on leash.

Note: It is illegal to harass or hunt rabbits or any other animals at American Camp.



As many as eight varieties of raptor — including bald and golden eagles — hold down the rabbit population.