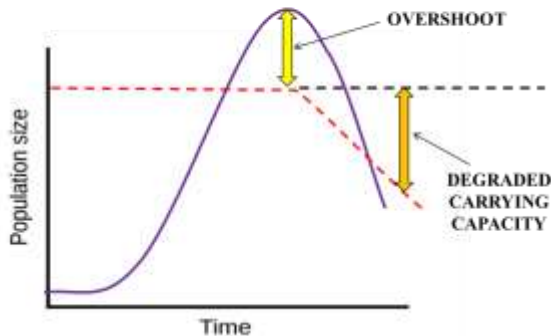
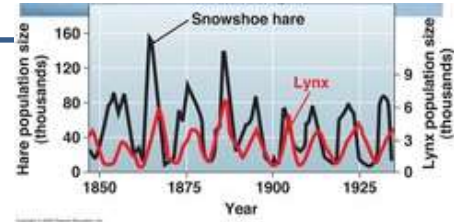


3. Population Overshoots

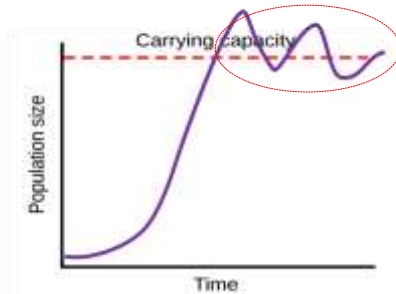
can lead to environmental degradation and lower the area's carrying capacity



Overshoot → Crash



“Boom and Bust”



Overshoot → Crash → Rebound → Overshoot
- can be observed in predator-prey relationships

CASE STUDY: ST. MATTHEW ISLAND, ALASKA

Ned Rozell / Dan Chay, originally published by Constructive Creativity

During World War II, while trying to stock a remote island in the Bering Sea with an emergency food source, the U.S. Coast Guard set in motion a classic experiment in the boom and bust of a wildlife population. The island was St. Matthew, an unoccupied 32-mile-long, four-mile-wide sliver of tundra and cliffs in the Bering Sea, more than 200 miles from the nearest Alaska village. In 1944, the Coast Guard installed a loran (long range aids to navigation) station on St. Matthew to help captains of U.S. ships and aircraft pilots pinpoint their locations. The Coast Guard put 19 men on the island to operate the station.

In August 1944, the Coast Guard released 29 reindeer as a backup food source for the men. Barged over from Nunivak Island, the animals landed in an ungulate paradise: lichen mats 4 inches thick carpeted areas of the island, and the men of the Coast Guard station were the reindeer's only potential predators.

The men left before they had the chance to shoot a reindeer. With the end of World War II approaching, the Coast Guard pulled the men from the island. St. Matthew's remaining residents were the seabirds that nest on its cliffs, McKay's snow buntings and other ground-nesting birds, arctic foxes, a single species of vole and 29 reindeer.

St. Matthew then had the classic ingredients for a population explosion: a group of healthy large herbivores with a limited food supply and no creature above them in the food chain. That's what Dave Klein saw when he visited the island in 1957.

Klein was then a biologist working for U.S. Fish and Wildlife Service. He is now a professor emeritus with the University of Alaska Fairbanks' Institute of Arctic Biology. The first time he hiked the length of St. Matthew Island in 1957, he and field assistant Jim Whisenant counted 1,350 reindeer, most of which were fat and in excellent shape. Klein noticed that reindeer had trampled and overgrazed some lichen mats, foreshadowing a disaster.

Klein did not get a chance to return to the island until summer 1963, when a Coast Guard cutter dropped him and three other scientists off on the island. As their boots hit the shore, they saw reindeer tracks, reindeer droppings, bent-over willows, and reindeer after reindeer. "We counted 6,000 of them," Klein said. "They were really hammering the lichens." The herd was then at a staggering density of 47 per square mile. Klein noted the animals' body size had decreased since his last visit, as had the ratio of yearling reindeer to adults. All signs pointed to a crash.

Other commitments and the difficulty of finding a ride to St. Matthew kept Klein away until summer 1966, but he heard a startling report from men on a Coast Guard cutter who had gone ashore to hunt reindeer in August 1965. The men had seen dozens of bleached reindeer skeletons scattered over the tundra.

When Klein returned in summer 1966, he, another biologist and a botanist found the island covered with skeletons. They counted only 42 live reindeer, no fawns, 41 females and one male with abnormal antlers that probably wasn't able to reproduce. During a few months, the reindeer population had dropped by 99 percent. Klein figured that thousands of reindeer starved during the winter after his last visit. With no breeding population, the reindeer of St. Matthew Island died off by the 1980s. The unintended experiment in population dynamics and range ecology ended as it began — with winds howling over a place where arctic foxes are once again the largest mammals roaming the tundra.