Beaver Census in the Erie National Wildlife Refuge: Seneca Division

Project Number:

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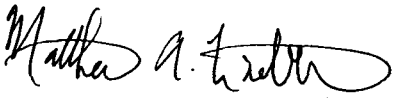
Pledge: 

Introduction

The beaver population is increasing rapidly, due to fewer predators, trapping regulations, low pelt prices and an abundance of forage and habitat (Naimen et al., 1988; Bhat, Huffaker, and Lenhart, 1993). This increase is important, because beaver naturally alter ecosystem structure and dynamics (Naimen, Melillo, and Hobbie, 1986). "Beaver activity results in alterations that: (1) modify channel geomorphology and hydrology, (2) increase retention of sediment and organic matter, (3) create and maintain wetlands, (4) modify nutrient cycling and decomposition dynamics by wetting soils, by altering the hydrologic regime, and by creating anaerobic zones in soils and sediments, (5) modify the riparian zone, including the species composition and growth form of plants, their chemistry (ligin, nitrogen, and defensive compounds), and the quality of allochthonous inputs, (6) influence the character of water and materials transported downstream, and (7) modify habitat, which ultimately influences community composition and diversity (Naimen et al., 1986)." These effects also have a significant long lasting impact on the landscape (Naimen et al., 1988).

The impact on the landscape can either be positive or negative. Beaver dams can create habitat for waterfowl, fish, amphibians, other mammals such as muskrat, and many insects (Malagise, 1994). These dams can also help control erosion and provide a good medium for plant growth (Malagise, 1994). On the other hand, beaver can become a nuisance if they block drainage flows and water-control structures, and render waterways impassible (Malagise, 1994).

The main objective of this internship project was to approximately determine the

population of beaver (castor canadensis) in the Seneca division of the Erie National Wildlife Refuge (E.N.W.R.). Determining the population of beaver will give a better idea as to whether the beaver are enhancing their environment or creating additional environmental problems and provide a basis for implementation of a management program. Another objective of this internship project was to improve the method of censusing beaver described in a previous internship project by Malagise (1994).

MAP??

Procedure

Sections K through Q of the Seneca division of the E.N.W.R. were censused for this internship project. Myself and two other internship students covered this area and employed a lodge/cache survey censusing technique (Swenson, 1983; Broschart, 1989; Hammond, 1943; cited in Malagise, 1994). For this technique, the researcher must locate active lodges, including land-lodges, and/or food caches and estimate the number of beaver by judging the colony size (Malagise, 1994). Dams, trails, cuttings and other evidence of beaver activity can also be used as population indicators (Malagise, 1994). In addition, a sign of over capacity of beaver in an area could be when a large tree is cut and returned to for feeding purposes (Malagise, 1994).

Evidence of beaver activity was recorded in a log book and map system for each area of the Seneca division. The guidelines for the lodge/cache survey technique are as follows: small lodge= 2-6 beaver, medium lodge= 6-10 beaver, large lodge= 10-14 beaver (Malagise, 1994). It has also been found that a family group occupying a bank den or lodge made of branches and mud, usually consists of the adult breeding pair with a variable number of kits and yearlings (Dyck and MacArthur, 1993). Furthermore, one colony of

beaver per cache was estimated and the number of beaver in the colony was dependent on the size of the cache (Malagise, 1994). Generally, beaver will only maintain one large dam per clan, which consists of anywhere from 4 to 14 beaver (Malagise, 1994). The final population of beaver will be a sum of the estimated values with uncertainties for each area of the Seneca division (Malagise, 1994).

Results

How calculated

Table 1: Number of Caches, Dams, Lodges and Beaver in each Trapping Area

	# Caches	# Dams	# Lodges	# Beaver	Uncertainty
Trapping Area K	3	0	1	8	± 4
Trapping Area L	9	15	8	70	± 20
Trapping Area M	5	2	3	20	± 5
Trapping Area N	6	1	4	16	± 4
Trapping Area O	8	1	6	30	± 7
Trapping Area P	13	5	5	50	± 15
Trapping Area Q	3	1	2	10	± 4
Totals	**47**	**25**	**29**	**204**	**± 59**

The results from this internship project show the total number of beaver in the Seneca division of the E.N.W.R. to be 204 +/- 59. The uncertainty value for the total number of beaver is so high because of the difficulty in measuring the caches, dams, and lodges mentioned in the discussion. The size of the caches, dams and lodges, as well as other signs of beaver activity, were taken into consideration when compiling the results for this project. Trapping area B in the Sugar Lake division was not included in this data because of a miscommunication.

Discussion

Overall, this internship project found the beaver population in the Seneca division

of the E.N.W.R. to be under control. However, there are a couple of areas that should be monitored closely and considered for a management program.

Trapping area K does not contain optimal conditions for beaver, thus there is minimal beaver activity and no need to be concerned with over population.

The greatest amount of beaver activity occurred in trapping area L. Mostly in the northern and central sections of this area, beaver have created huge dams that produced a great deal of watersheds and swamps. There were also large trees felled and stripped by beaver in this area, which is an indication that the beaver have exhausted their use of smaller trees. For these reasons, it is suggested that a trapping program be implemented in this area to prevent further environmental damage and overpopulation of the beaver.

Trapping areas M and N have an average population of beaver, which indicates that the population is stable with an ample food supply (Malagise, 1994). The only section of these areas that might pose a problem is the section near the bridge on Swamp road.

The southern sections of trapping area O is where most of the beaver activity was located. There doesn't appear to be a beaver problem in area O now, but some signs indicate problems could arise. Recent evidence of beaver cutting large trees and stripping them for cache was found and the beaver are running out of trees on the one side of the stream that is bordered by farmland.

Trapping area P is apparently the second most highly populated area in the Seneca division. Most of the beaver activity was found in the northern sections of area P. This area should be considered for trapping to control the population of beaver.

The final trapping area (Q) was not very heavily populated by beaver. This area was

also the smallest on in the Seneca division and should not be of major concern in terms of trapping management.

The best way to get an idea of the level of beaver activity in the E.N.W.R. seems to be actually going into the areas and observing the environment and habitat. However, there are still some problems with this censusing technique. The presence of underwater food caches could not be detected by the censusing method used in this internship project. Furthermore, Jenkins (1981: 577) (cited in Beier and Barrett, 1987) and Osmundson and Buskirk (1993) found that relating cache size to colony size could be problematic. The variability in estimating the size of the colony based on the level of beaver activity could also cause problems in accurately representing the beaver population. Beavers concentrate on foraging and caring for their you more than construction and occupation of the primary lodge during the spring and summer (Dyck and MacArthur, 1993). Therefore, the lodge/cache censusing might have been more difficult to employ during this time of the year. Finally, the inability to physically get to some of the sections in the Seneca division could have prevented us from obtaining all of the necessary data. Even though the data might not be completely accurate, I am confident that this project successfully located areas of the Seneca division of the E.N.W.R. that could be problematic due to an overpopulation of beaver.

Suggestions for future

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