

# CAPSTONE PROJECT PAPER SAMPLE

## Habitat and Landscape Attributes that Impact Beaver Distribution



### Abstract

The elimination of beavers across the landscape of North America within the period of the 1600s until the 1800s has played a big impact on the alteration of riparian and stream resources. The degradation of the riparian habitats has influenced a lot of fish and wildlife species, including those which have been listed in the Endangered Species Act. The capacity of beavers to modify the stream ecosystem provides a highly unique opportunity to restore habitats. A number of government and private agencies work towards using beavers as a tool for restoration, not just for the better functioning of ecosystem, but also to benefit the lives of human beings. Taking a bigger look at the real picture, the ability of beavers to modify the environment are being viewed by means of describing ecological benefits, its impact on stream ecosystems, as well as their influences on fish populations and habitat.

It has been suggested that as the population of beaver starts to make a comeback, they will end up occupying a wide range of habitats. The data presented shows that beavers occupy a wide range of characteristics including landscape and site habitats. However, there are specific attributes which are far more important compared to others when it comes to determining whether beavers are present in a certain area. The overlapping of landscapes, site, as well as vegetation in between sites indicate that there are a lot of areas which may have already been suitable for beaver occupancy, offering optimism for opportunities involving beaver restoration.

### Introduction

According to records in history, North American beavers were found in a huge population distribution, influencing the function and structure of streams, fish and wildlife populations, as well as riparian areas (Bob and Gil, 2004). The landscape and ecosystem role influences of beavers have become understood and accepted increasingly (Kale et al, 2012). As this awareness continues to grow, so does the actual interest from spatial distribution, land management, as well as factors that influence their distribution continue to spread out. Restoration of beavers has been considered as a tool for land managers, and is also being explored as a potential method that can contribute in terms of fighting global warming and improving water storage.

Before the Europeans arrived, the population of beaver in North America was at a range of 60 to 400 million (Selton, 1955), covering a wide spectrum of natural ecoregions, from subarctic to subtropical, occurring from coast to coast all throughout North America. The removal of beaver coming from portions of the historic range has been concluded as a major factor that influences the patterns and structure of vegetation among riparian ecosystems. Among the several land management plans currently being presented is watershed restoration. There are also some recovery efforts on endangered species on both public and private areas.

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## Beaver Impacts on Stream Ecosystems

Impacts coming from beaver may offer both advantages and disadvantages, highly depending on the characteristics of the site history, present watershed processes, as well as land management, including the longevity of the different dam-building capacities. Though the actual extent with which positive impacts coming from beavers have been reduced, there are a lot of advantages gained from these beaver activities. Most benefits come from the creation of dams, impacting geomorphology, hydrology, aquatic invertebrates, water chemistry, as well as animal and plant populations.

## Beaver Impacts on Fish Populations and Habitat

A meta-analysis regarding expert and literature opinion on the impacts of beaver to fish populations and habitat was conducted recently by Kale et al. (2012). The commonly cited benefits include an increase in habitat heterogeneity, overwintering and rearing habitat, flow refuge, as well as inverted production. On the other hand, among the negative impacts include impeded movements of fishes because of the dams, low oxygen levels in ponds, as well as the siltation of spawning habitat. The study discovered that the presence of beavers have an overall positive impact on fish populations, made possible through their productivity and fish abundance.

## Conclusion

The impact of beaver activity on the actual fish production is particularly interesting because of the threatened and endangered status of specific fish species, including those that have been listed in the Endangered Species Act. Fish populations have been shown to positively respond to habitat production through these beaver activities, disproportionately using these habitats to their availability. As such, beavers have been documented to play a major role within the ecological community. As a result, they have increased the production of systems for the benefit of various fish species.

## References



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