The Assessment of Indexing a Population of Mink on Kiawah Island

Prepared by Lisa Vandiver
in conjunction with Kiawah Island Natural Habitat Conservancy and the South Carolina Department of Natural Resources

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

First and foremost, I would like to thank the Kiawah Island Natural Habitat Conservancy for providing me with such an amazing opportunity as the Mink study. Without your monetary and physical support, this study would not have been possible. I want to give my gratitude to Barbara Winslow. She was a lot of the driving force behind this project and she helped keep me going even when the boat was broken down! I appreciate all of the time and effort that she has put forth in this project, without Barbara this project would have been tough to accomplish. I would also like to mention Donna Windham and Aimee Robert who have followed me through this project and always made sure that I was taken care of. Most of all, the members of the KINHC deserve credit for this study. Without their interest and passion for environment sustainment, this study would not have been an option.

Special thanks are in order for Buddy Baker and the South Carolina Department of Natural Resources for the lending of all of the equipment for the study. I am particularly grateful to Buddy Baker for the time and effort he has put into this study. Without his dedication this project would not have been possible. I would also like to thank Jason Peeples for his insight on previous projects and offering me the experiences with the mink relocation study. Thanks are in order for Pris Wright, with the SC division of Fisheries and Wildlife, for all of her support and assistance whenever I needed it. Also, several individuals from the Marine division of DNR, at Fort Johnson, have been extremely helpful and I appreciate all of the efforts they have put into my project.

I would like to extend my praise to the volunteer's that made the mink study possible. Thanks are in order for the owners of the dock at Rhett's Bluff that were so kind

to allow me to use their dock this summer. I truly appreciate the help provided by Carrie Manson, Kurt Wassen, Barbara Winslow, and Chad Hayes. Thanks for being patient and watchful on our trips out into the marsh! I am extremely gracious to Jim Jordan and Shane Roberts for all of their help in tailoring the boat. Lastly and most importantly, thanks to Chad Hayes for lending his truck and boat a countless number of times. I appreciate Chad trusting me with his equipment.

INTRODUCTION

In 1980, the South Carolina Department of Natural Resources began examining the status of mink (*Mustela vision*) for the state. Researchers were upset to find a population that was in desperate need of help. Through surveys and indexing techniques, they found that the mink population was rapidly declining. In South Carolina mink harvest levels were as high as 11, 408 in 1937, but by 1960 harvesting had dropped below 1,000. Furthermore, a mail survey indicated that 40% of the mink trappers in South Carolina had noticed a declining trend in the mink population (Baker, 1998). Researchers determined that it was important to provide a system for indexing a population of mink rather than depending on observational techniques.

Scent/Track boards were utilized to index the population of mink in upland areas of South Carolina. Through this research, it was determined that they needed to improve and test new ways of indexing a population. Eventually, in 1990, flood-tide surveys were conducted along the marshes of South Carolina in search of a more effective means of indexing a population. During these surveys, they found that less mink were found from Charleston to North Carolina compared to Charleston to Savannah (Baker, 1998). In further research, they found that mink carcasses north of Charleston revealed a high level of environmental contaminants, including DDE, DDT, and mercury. Through fossil records, they concluded that at one time there did exist a healthy mink population north of Charleston. It was then determined that the DNR was going to attempt relocation efforts in North Inlet, near Georgetown.

In the past three years, there has been a study on the relocation efforts of mink. Overall, mink relocation has been successful. Now it is important to find a more effective

means of indexing a population of mink, so that we may be able to monitor mink populations accurately. Once accurate indexing techniques are in place, we may apply this knowledge to relocation efforts and monitoring of ecosystems through mink as a biological indicator of environmental pollutants.

MATERIALS AND METHODS

Population abundance surveys were conducted along the Kiawah River, Stono River, and adjacent creeks (see Figure 1) from June to September. Fifty-five tracking stations were placed on tidal wrack or high grass to ensure that they would remain stable throughout the study period. The tracking stations were put in place, and checked, during a high tide to guarantee ease of accessibility to the tidal wracks. They were placed approximately one-half of a mile apart from one another.

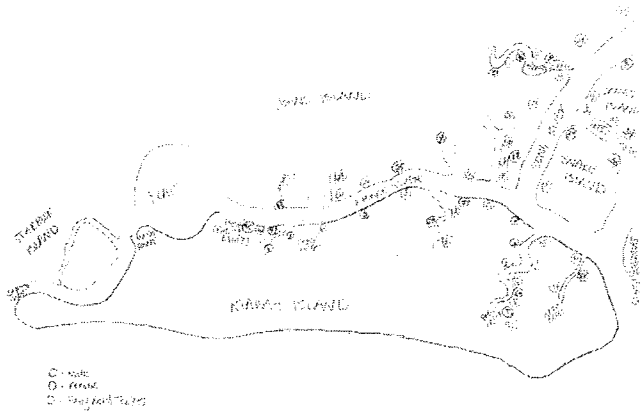

Figure 1: Location of tracking stations.

The track board survey technique was originally developed for inland mink population surveys. Each station requires a medium (soot or ink) for the mink to leave their tracks and an attractant (fatty acid tablets or scat). The track boards were placed on Styrofoam and secured with a steel rod, allowing for tidal fluctuations.

In searching for the most effective means of indexing a population, several varieties of tracking stations were tested. There were three sizes of track boards used: (1) 30-inch length by 11-inch width, (2) 30-inch length by 10-inch width, and (3) 20-inch length by 11-inch width. Next, there were three techniques applied: (1) Scat on soot, (2)

Tabs on soot, and (3) Scat on ink boards. Lastly, the amount of time between checking the track boards from three days to greater than 10 days. This range in time would help determine the best visitations rates versus the sustainment of the medium.

In addition to the main indexing project: flood tide surveys, trapping and relocation efforts were utilized for insight into current South Carolina mink projects.

RESULTS

Over the three-month study, mink visitation on Kiawah was very optimistic, with an average of 42% (with a variance of 20.5%), compared to the visitation rates on Cape Romain (18.2%) and Daufuskie Island (36.3%) (see Figure 2). Visitation rates varied

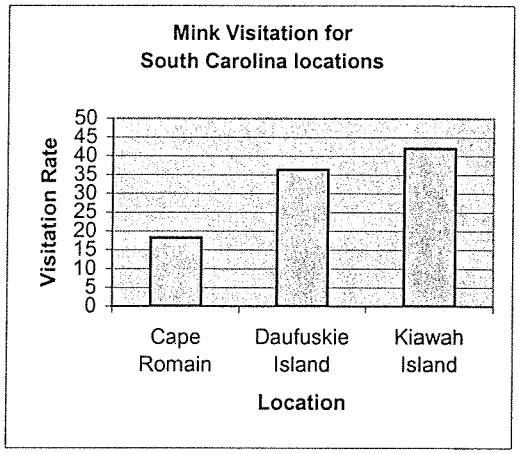

Figure 2: Comparison of mink visitation rates for South Carolina.

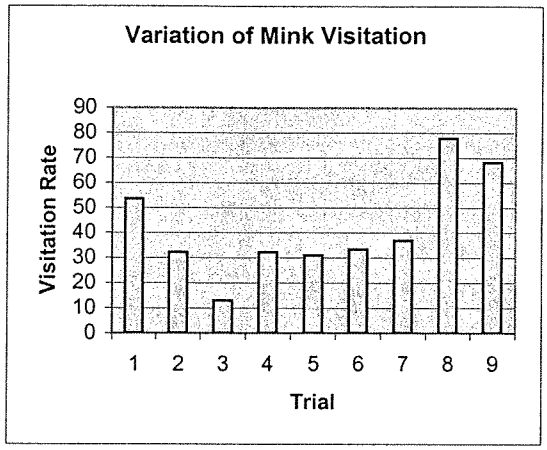

Figure 3: Variation of mink visitation rates from July to September.

greatly between collecting periods. Trial 8 had an extremely high visitation rate at 77.8%, while trial 3 had a visitation rate as low as 12.9% (see figure 3). This variation in visitation rates forces on to consider the data simply as trends.

The different techniques utilized during the study, had varying results. When comparing the effects of the gender of the scat on visitation rate, there is no significant difference between male and female scat. Male scat occupies an average of 49.36% of the visitations of mink, while female scat has an average of 49.73% of the visitations (see figure 4). On the other hand, the length of track boards appeared to influence the

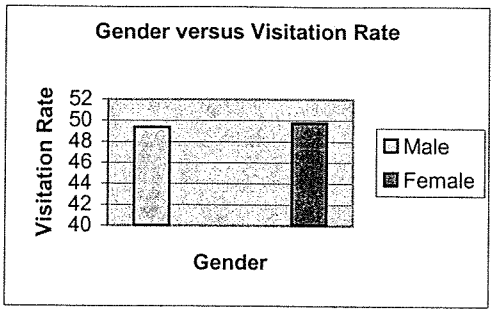

Figure 4: The effects of gender on mink visitation rates.

visitation rates of the mink. The average visitation rate for the 10-inch width was 39.89% (19.59% variance) and for the 11-inch width was 26.35% (29.06% variance)(see figure 5). Similarly, the 30-inch length appeared to have a positive influence on mink visitation

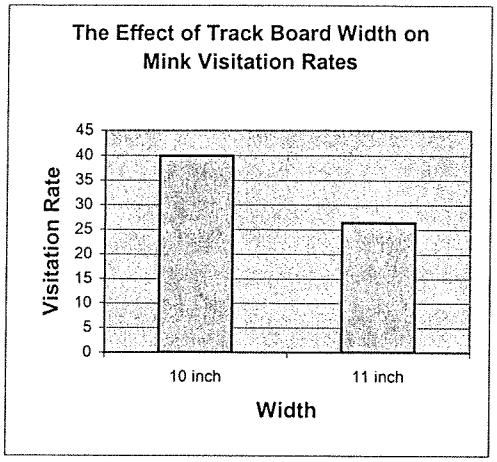

Figure 5: The comparison of track board width and visitation rate.

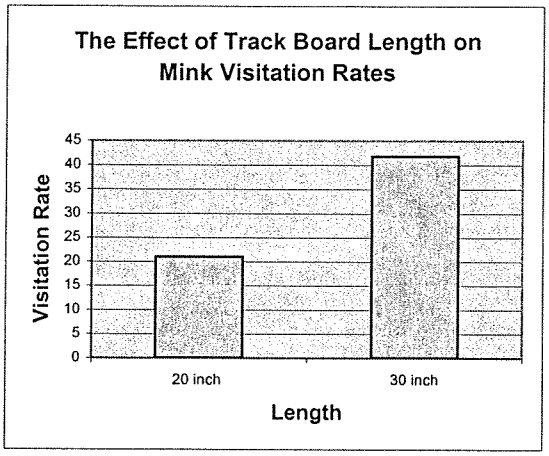

Figure 6: The comparison of track board length and visitation rate.

compared to the 20-inch length. Although, the 20-inch length was only observed for 4 trial periods, while the 30-inch length was tested for the entire 9 trials. The average visitation rates for the 30-inch length was 41.82% (variation 19%), while the 20-inch length had 21.03% visitation (variation 47.86%) (see figure 6). In addition, the soot, compared to ink, showed a trend toward increased mink visitation. The average visitation rate for the soot was 44.59% (variation 21.63%) and for the ink was 12.96% (variation 47.87%) (see figure 7). Once again, the ink was only tested for 4 trial

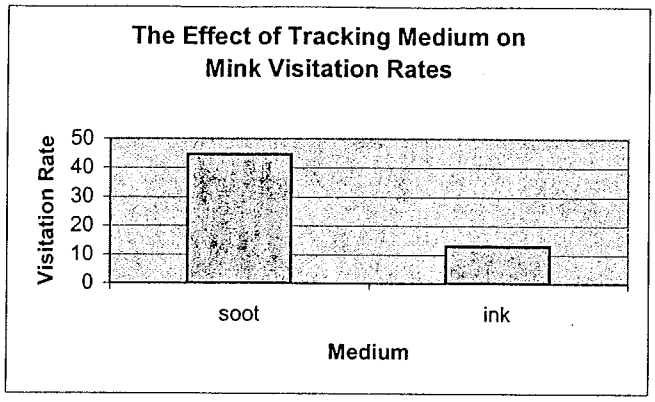

Figure 7: The comparison of tracking medium and visitation rates.

periods, while the soot was tested the entire study.

Lastly, length of time between collecting the track boards was studied. An increase in the number of days, showed an increase in mink visitation rates. The length of time was broken into four categories: 3-4 days, 5-7 days, 8-10 days, and greater than 10 days. Three-four days had an average visitation rate of 19.4% (variation 8.12%), 5-7 days had 23.65% visitation (variation 17.92%), 8-10 days had 36% visitation (variation 24.31%), and greater than 10 days had 78.17% visitation (variation 15.37%) (see figure 8). As the length of time increased, there was a definite trend toward greater visitation rates, but the quality of the medium deteriorated as well as the quality of the tracks.

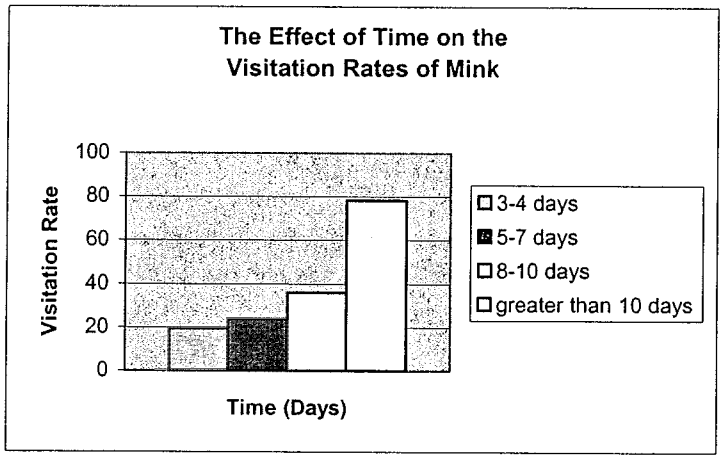

Figure 8: The comparison of the length of time between trials and visitation rates.

There were several more unidentified tracks in the greater than 10 day range, than the rest of the categories. In addition, after 8 days the soot began to deteriorate significantly (see figure 9).

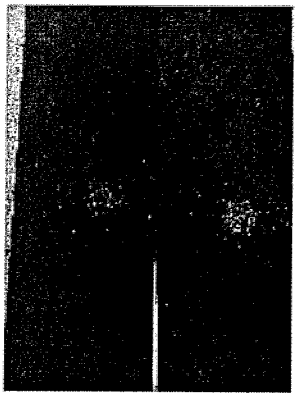

Figure 9: Difference in the quality of the soot from 3 days (left) to 8 days (right).

DISCUSSION

According to the results of this study, there is a large population of mink residing in the marsh surrounding Kiawah Island. Since visitation rates were so high, it would be advantageous to continue a study of indexing mink on Kiawah Island. In addition, the mink tracks that were left on the track boards were extremely clear. Oftentimes, the mink tracks consisted of mud, which made identification of tracks fairly easy. The tracks left on the soot could be easily tampered with and were extremely faint, compared to the tracks with mud (see figure 10). Since there were so many mud tracks, it may be possible to continue a study using track boards with no medium.

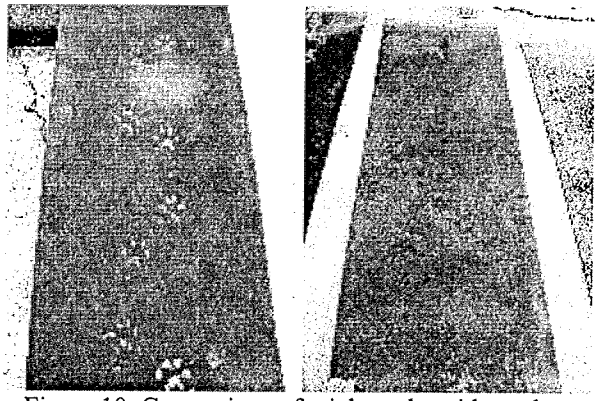

Figure 10: Comparison of mink tracks with mud (left) to mink tracks with soot (right).

In comparing the width of the track boards, the 10-inch track boards had approximately a 15% higher visitation rate than the 11-inch. Although this is not significant, the 10-inch width did appear to have several advantages over the 11-inch width. First, the 10-inch was very good at preventing raccoons from entering the tracking station. Raccoon tracks are fairly similar to mink tracks (especially when there is not a clear track) and may be easily mistaken. If the 10-inch width can reduce the number of raccoons entering the tracking station, this could assist in track identification. Second,

and most importantly, the 10-inch width appears to protect the medium more effectively from wave action. Wave action, particularly from boats, can wash away nearly all of the soot on a track board. If the 10-inch width can eliminate wave action, than this could play an important role in preserving the tracks on a track board. In addition to these advantages, it appeared that the 10-inch width contained heat more effectively than the 11-inch. Mink prefer cooler temperatures, so this characteristic of the 10-inch may deter mink from the tracking stations (this is something that may be considered in future research).

In studying the length of the tracking stations, it appears that the 30-inch track boards are more effective than the 20-inch track boards. Although this may be true, the 20-inch track boards were studied a lot less than the 30-inch track boards (5 trial periods less). Regardless, the 30-inch track boards do have several advantages over the 20-inch track boards. The longer length of the 30-inch track boards allows for more surface area to track the mink with, in addition to shielding wave action. Since the 30-inch track board is longer, the wave action generally will only penetrate the first few inches into the track board. On the other hand, the 20-inch track board is much shorter allowing for wave action to wash away much of the soot contained on a track board.

In comparing the mediums used in the study, it appears that the soot is far more effective than the ink. Once again, the soot was studied longer than the ink (5 trial periods), therefore, these results are not significant. The soot, although not statistically proven more effective, does have several advantages over the ink. In preparing the ink boards, first one must role on the ink, spray adhesive glue onto the board and cut a piece of paper and place the paper on the glue. Then, one may place the scat on the paper as an

attractant. In the study, this process took a long time compared to the preparing of the soot boards. In addition, any wave action either washed away the paper on the board or made the paper less effective for detecting tracks. The soot boards were extremely beneficial. They were able to withstand small amounts of wave action and took less time to set-up (which is important when one is limited to a two-hour set-up period).

During the study, the scat would disappear, after a few days, most likely from the fiddler crabs consuming the scat. In the last two trial periods, fatty acid tablets were compared against scat for effectiveness. Comparing trial periods 8 and 9 of the two mediums, fatty acid tablets had an average of 83.3% visitation and scat 68.99% visitation. Although these numbers are not significant, it is apparent that fatty acid tablets should be considered in further research.

Lastly, the length of time between checking track boards appeared to have a distinct effect on the visitation rates of the mink. The "greater than ten days" category had an outstanding visitation rate of 78.16%, but the quality of the medium was extremely poor. While studying the best visitation rates versus the quality of the medium, I found that the 5 to 7 day range was most effective. Over 5 to 7 days the average visitation rate was 23.65%, and the medium (particularly soot) was still intact. After about 7 or 8 days the medium appeared to lose its quality (see figure 9).

SUMMARY

In conclusion, this study has provided a beginning for an initial indexing technique. It appears that the 10-inch width by 30-inch length is most effective in tracking mink. Although, the high temperature (during the summer) in the 10-inch width track boards may deter the mink from visiting these stations. Therefore, it may be of interest to study tracking stations during cooler months to see if the temperature, as well as season, has an effect on mink visitation. Soot is, by far, the most effective medium for tracking mink. Although, based on the several mud tracks this study received, it may be of interest to study tracking stations that have no medium. Scat was the most widely used attractant during this study, but it appears that the fatty acid tablets are just as effective as the scat. In addition, the fatty acid tablets were not consumed and did not deteriorate during trail periods like the scat did. Considering that the mink most likely visited the stations after the fiddler crabs consumed the scat, it might be advantageous to question whether an attractant is even necessary. Lastly, the most effective time between checking track boards was 5 to 7 days. This amount of time yielded the highest percent of visitation for the quality of the medium.

LITERATURE CITED

Baker, O.E.III. 1999. The Status of Mink in South Carolina. South Carolina Department Natural Resources. Furbearer project report. 99-01.