

Chapter 6: Summary and Conclusions

This analysis provides significant contributions to existing research on human subsistence patterns in general, and southern New Zealand in particular. By using foraging theory models to structure the analysis of how subsistence changes as important resources such as moas and seals declined, the picture created of subsistence change at Shag Mouth is more detailed than in previous studies. For example, testing the expectations of the prey choice models within patches, as is expected in the fine-grained assumption, provides valuable information about spatial variability in changing resource use. Different patterns of resource use emerge from the three patches. In both the inland and offshore patches, one taxon is the dominant resource utilized. Initially, at Shag Mouth, two patches were exploited. Within the inland patch, foraging specialized on moas. In the coastal patch, a broader range of resources was being used in the coastal patch. However, the large-bodied, high ranked pinnipeds still comprised a significant proportion of the diet early during the occupation of Shag Mouth. Initially, the offshore patch appears to have been used only intermittently and did not contribute significantly to the diet.

The pattern of change across time revealed by this analysis is also more fine-grained than previous analyses. During the occupation of the site, diet changed significantly. Moa and seal abundances declined dramatically during the occupation of the site. The decline in these high ranked resources resulted in a significant increase in the number of resources exploited, with lower ranked resources comprising a larger proportion of the diet. Only after the foraging efficiency in the other two patches declined did exploitation of resources in the offshore patch become important. Late in the occupation, offshore

patch use increased with barracouta becoming the most common resource exploited out of all three patches.

An important aspect of using foraging theory models is that they provide a causal argument for change, namely resource depression. Most explanations of declining prey abundances resulting from human subsistence practices refer to 'overexploitation' or 'overkill'. The implicit assumption behind these notions is that predator-prey relationships are typically in equilibrium, except in unusual circumstances where overharvesting occurs. Thus, these models tend to focus on one end of the spectrum where subsistence change consists mainly of marked declines in resources.

In contrast to overexploitation models, resource depression assumes that foraging efforts of predators will always affect the availability of resources to one degree or another. Thus, foraging theory models that employ resource depression as an explanation can be used across a broader range of magnitudes of expected subsistence change. They are useful for understanding the dynamic relationship between human foraging behavior and prey availability in any situation, catastrophic or gradual, modern or prehistoric. Thus, extinction-related subsistence change, such as that examined in this study, is not treated as unique or special, but is just one type of change along a continuum of changing subsistence.

In addition, this study shows that the pattern of subsistence change is much different from that predicted by overkill models. Foragers do not specialize on a high-ranked resource until the resource becomes extinct. Rather, as predicted by the prey and patch choice models, foragers modify their diet, expanding the range of resources they pursue as the high-ranked resource declines. In fact, because moas still comprised over 50% of

the inland patch intake at the end of the occupation at Shag Mouth, it appears that the site was abandoned before moas went extinct.

The use of foraging theory models also allow for the integration of the diet and butchery or transport aspects of subsistence studies under one analytical framework. The changes in body part use of moas and seals at Shag River Mouth appear to be related to travel costs. As local populations of moas dwindle, transport costs increase, leading to an increase in off-site processing and the transport of skeletal elements with high net returns. For seals, skeletal element use becomes more intensive; more of each individual was returned to the site over time. The broadening in the utility of elements transported suggests that distance may not be a factor in transport decisions. For both moas and seals, long bone marrow and grease do not appear to have been major resources.

The foraging theory models used in this analysis were originally developed to provide explanations about subsistence behavior in an ecological time frame. The application of these models to archaeological contexts has required modifications to accommodate the longer time scale. Building on earlier studies, this analysis adds to the literature by articulating the prey and patch choice models. In general, patches are difficult to define in archaeological situations because prey types often crosscut habitats (Cannon 1999). In the case of the Shag River Mouth faunas from southern New Zealand, however, I was able to define patches that minimized the possibility of overlapping habitats, while also maximized the patch-specific homogeneity required by the assumptions of the prey choice model. The predictions of the prey choice model were then applied to each patch separately.

While much has been learned in this study, there are still several areas that require further research. The effects of differential preservation on skeletal element representation of moas must be examined. In addition the role of moa bone as a raw material for tool manufacture in influencing transport decisions must be studied. If either of these factors can be shown to have played a significant role in structuring the Shag Mouth faunas, the interpretations on skeletal elemental use may need to be reconsidered. Even in the absence of these studies, however, the patterns of dietary change at Shag Mouth appear to be quite robust.