

Resource Depression, Extinction, and Subsistence Change
in Prehistoric Southern New Zealand

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Abstract

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Humans have been modifying their environment throughout prehistory. While many studies have examined the human impact on the environment, few have explicitly examined how foragers adapt to the changing environmental situations that they have created. The goal of this analysis is to study the relationship between human foraging economies and human-related environmental change in southern New Zealand. Foraging theory is used to generate predictions about subsistence change resulting from the declining abundance of important resources such as moas and seals. In particular, these predictions examine changes in 1) the kind of resources exploited (foraging efficiency), 2) the number of resources utilized (diet breadth), 3) the habitats exploited (patch use), and 4) the processing and transport of skeletal elements. The predictions are tested using the large assemblage of vertebrate faunal remains from the well-stratified and well-dated Shag River Mouth site.

My analyses demonstrate that as the high-ranked taxa decline, overall foraging efficiency declines. The decline is significant enough that diet breadth expands to include low ranked taxa within patches already utilized, as well as the addition of

previously ignored patches. Resource depression is identified as the cause of the decline in foraging efficiency.

As foraging efficiency declines, the utilization of individual prey items also changes. For moas, field processing of carcasses increases, with an increasing tendency to transport high utility elements. The increase in selectivity indicates that transport costs are increasing as local population of moas decline. In contrast, seals are used more intensively over time, i.e., a broader range of high and low utility elements are transported to the site, suggesting that local populations of seals are used throughout the occupation of the site and that transport costs of seals remain relatively stable.

This study shows that using foraging theory models to structure analysis provides a more fine-grained spatial and temporal resolution of subsistence change in southern New Zealand than has been previously achieved. In addition, these models articulate various subsistence decisions that are usually treated separately. The study also contributes to the foraging theory literature by demonstrating how both the prey and patch choice models can be applied archaeologically.

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