

DEVELOPMENT AND APPLICATION OF A STATISTICAL MODEL  
FOR THE CUMULATIVE EFFECTS OF HUMAN INTERVENTION ON BALD  
EAGLE HABITAT IN THE GRAND TETON NATIONAL PARK

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Objectives

The research underway has three primary objectives. The first of these is to test the transferability of the cumulative effects model (CEM) developed for the Bridger-Teton National Forest to the Grand Teton National Park. The second major objective is the development of computer software which will easily implement the CEM into the management decision process. For this objective it is necessary that the software be available on standard personal computers, that it provide appropriate tables and graphics suitable for reports, and that it be flexible in terms of the range of "what if" questions that might be posed by the manager. The last objective is to implement the CEM and the computer package developed to assess the bald eagle habitat in Grand Teton National Park.

Methods

The first objective is being met through the use of primary and secondary data collected in the Grand Teton National Park concerning the magnitude and types of human intervention that occur on the Snake River bald eagle habitat. The model already developed will be used to estimate the habitat available given these observed interventions. Finally, these model predictions will be compared to observed eagle behavior in the area. These data on eagle behavior are being collected by other researchers, and because of their nature will be difficult to obtain and evaluate. The best that is expected is to judge whether the model values predicted are consistent with the general size and activity of the eagle population that exists. If necessary, the model may be calibrated using observed data.

The second objective requires the development of a computer package that is very transportable so it can be used on a variety of personal computers and "user friendly" so it really can be an effective management decision tool. It is essential that the needs of the managers be well understood prior to the development, and that opportunity exist for the modifications and additions suggested by the managers to be incorporated into the programs.

The final objective is dependent on the results of the first two. The CEM and the software developed will provide an excellent tool for evaluating the habitat and assessing the effects of any proposed changes.

### Results

Primary data were collected in the months of July and August using a sampling scheme balanced on day of week, time of day, and location on river. The purpose of these data are to obtain estimates of number of rafts, spacing of rafts, and activity of other bank users. When possible, activity of eagles and osprey were noted in relation to human activity on the river. In addition, four float trips were made to obtain some data on the number, location and spacing of bank users. These data will be augmented with data collected by the Park Service this year and in past years concerning the magnitude and types of human intervention on the Snake River. These data were received in December. Estimates of magnitudes of human intervention obtained from primary and secondary data will be used to test the CEM.

The computer software required to implement the CEM was completed in the fall semester. Disks containing the program have been distributed along with instructions for use and a manual containing examples. This part of the project was completed early so that managers using the programs may have time to suggest modifications and additions. At this time the graphics have been developed for only one graphics board. It will be adapted for use by all of the common graphics boards.