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APPLICATION OF LANDSAT MSS TO ELK HABITAT MANAGEMENT

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The Oregon Department of Fish & Wildlife (ODFW), has utilized information derived from Landsat MSS data to estimate the impact of proposed timber harvests on potential elk use. These evaluations have been conducted in Northeastern Oregon where several herds of Rocky Mountain elk range in the Blue Mountains. The analysis of Landsat data for elk habitat inventory and mapping and associated field sampling was supported by the ODFW, the Environmental Remote Sensing Applications Laboratory (ERSAL), Oregon State University, the Pacific Northwest Regional Commission and the US Forest Service, Pacific Northwest Forest & Range Experiment Station, Range & Wildlife Habitat Laboratory.

Water, forage and cover, i.e., hiding and thermal cover, are the critical components of elk habitat. The animals seek those areas which provide the necessary combination and arrangement of these critical components.

Timber harvesting, more than any other forest management activity, can have profound impact on the quality and quantity of these essential habitat requirements. Harvesting can have both beneficial and deleterious impacts on elk ranges by increasing forage and reducing cover. Forage areas can be created where little exists. In other areas, where potential elk use is already limited by a shortage of cover, timber removal may eliminate vital patches of cover and further reduce the potential of an area to support elk.

The US Department of Agriculture, Agriculture Handbook 553 entitled "Wildlife Habitats in Managed Forests: the Blue Mountains of Oregon and Washington," provide guides for estimating impacts of timber harvesting when amounts of pre-harvest cover and forage areas can be quantified as well as the cover area that will be converted to forage area by the harvest. The Handbook states the optimum cover-forage relationship for elk in the Blue Mountains is 40% in cover and 60% in forage producing areas of proper size and spacing.

Personnel of ODFW and ERSAL utilized Landsat data to inventory and map cover and forage areas on two of the Blue Mountain elk ranges in 1979 and 1980. Since completion of that project, ODFW has initiated the same procedures for approximately seven million additional acres that provide ranges for numerous other elk herds. The inventory, available

on magnetic tape, is a geographically referenced data base regarding land cover types and habitat components (cover/forage). The wildlife biologist can readily access this data base, pull out data for a specified area in the form of a computer printout, overlay the boundaries of the proposed timber harvest areas, calculate the current cover-forage status of the area and the proposed changes in that status, reference the appropriate elk use response curve in the Agriculture Handbook 553 and estimate the extent to which potential elk use will be increased or diminished by the proposed harvest and habitat modifications. The biologist can also use the printout to estimate the size of forage areas to be created and cover areas that will be left intact and make the critically important evaluations of the size and spacing of these areas in relation to optimum elk habitat.