

Space Technology Aids Biologists in Tracking Elk

By Ron Shay

Products of the space program are helping Oregon biologists plot the movements of 25 elk in southwestern Oregon.

Last winter, 24 cow elk and one spike bull were fitted with radio collars in the traditional fashion, utilizing tranquilizer guns and drugs. Usually, after the elk are thus equipped with the small radio transmitters, they are tracked by biologists on foot, horseback, in a vehicle, or trying to mark map locations while flying over the area.

However, things have gone space-age with this bunch of animals according to Larry Conn, Oregon Department of Fish and Wildlife (ODFW) district biologist for the area. The project is being carried out in conjunction with the Umpqua National Forest which is providing aircraft and electronic equipment.

Spin-off products of the space program are used in creating the miniaturized radio transmitters that are attached to the collars put around the necks of the elk. The use of solid state electronics has made it possible to create radios that will take the abuse that comes with hanging around the neck of an elk going through the brush. Additionally, the actual transmitter only weighs about half a pound; even with the addition of batteries and protective materials it does not create a burden on the animal.

In the past, Conn and his assistant, Steve Denney,

would have spent many hours tracking the signals of the various animals and plotting them on maps. This is still done when detailed movement of animals is wanted. However, with the herd of 25, ODFW and the Umpqua Forest want to try to determine general movements and use of various types of plant cover.

The Landsat satellites orbiting several hundred miles above the earth have provided the base for this type of study. As the satellite passes over, it senses the different colors it sees on the earth and translates the information into electronic data. The data are transmitted back to earth, then interpreted and made into maps showing the various types of plant growth covering the area. The satellites can break the cover types down into units that are about 80 yards square.

The biologists are concerned about three main kinds of plant life utilized by the elk. Vegetation that provides food for the foraging animals is obviously one important type. Hiding cover is another plant type; the third consists of larger growth, such as timber that provides thermal cover. Basically, this latter type of area gives the animals shelter from the weather during extremely hot periods or during cold spells. It is possible to determine the different cover types from the images created with Landsat.

Then another recent electronic innovation enters the scene. Mariners have been using LORAN or Long Range Aids to Navigation for a number of years. This gives the person equipped with the necessary gear a set of numbers that virtually puts an "X" on the map indicating his location. Since the system is based on radio signals sent out by specialized transmitting towers, it can be used over land as well as the water.

And, a number of years ago, a Japanese gentleman invented a very directional radio receiving antenna called a Yagi antenna. Put all of these pieces of wizardry together and you have "elk monitoring a la 1985."

The radio transmitter collars were put in place last winter. On a weekly basis in the months of November through April, an aircraft equipped with a LORAN system, and radio receiver with the directional Yagi antenna, flew the area where the elk were hanging out. As the elk were located, their location was recorded with the LORAN gear. The location information, which had been recorded on a map that correlates with LORAN fixes, was then transferred to the LANDSAT image and made it possible to plot the movements of the animals through the various types of cover. And what is provided is not simply group coverage, since each of the animals has a distinctive signal from its transmitter so that individual movements can be plotted.

One flight each month will be made during May and June; then the job of correlating the information with the cover maps will be attempted. Previous studies in other parts of the state have shown that big game animals need a mix of the various types of cover. The concept is proven: the work being done on the Umpqua National Forest will add to the overall knowledge about Roosevelt elk and give specific information about the herds of southwestern Oregon. Information is being collected more readily using modern technology, but still needs the interpretation of trained human senses.

Shay is editor of Oregon Wildlife, bimonthly publication of the Oregon Dept. of Fish and Wildlife.