



A Yukon Fish and Wildlife Management Board  
Series: The Impacts of Oil and Gas Industry  
Activity on Fish and Wildlife.

## Linear Developments

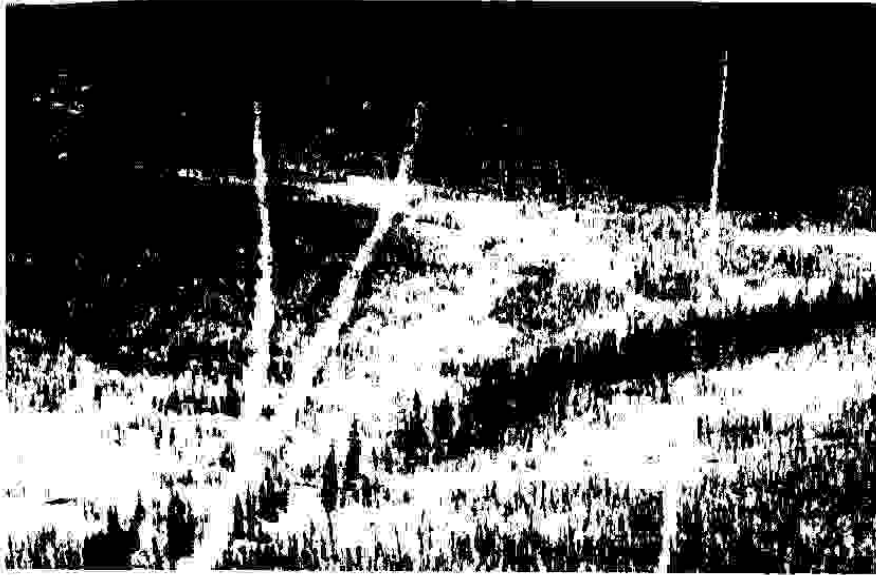


Photo: Niki Wilson

Seismic lines, old and new. Eagle Plains, Yukon Territory.



## Linear Developments - What are they?

The term "linear developments" refers to roads, seismic lines, and pipeline routes. These are all part of exploration, development and transportation of oil and gas resources.

## What are the potential impacts of linear developments?

A range of impacts can result from linear developments. Roads, seismic lines, and pipelines can increase access into new areas, displace wildlife from their habitat, act as barriers to wildlife movement, and affect migration routes.

### Roads

Roads may have a greater impact than all other linear developments. Many species of animals avoid roads to some degree. For example, both bears and caribou have been found to avoid roads around a number of human developments. In a development in Alaska, the number of caribou decreased in proportion to the increase in the number of roads. In another study in Alberta, roads were at least a partial barrier to movement for woodland caribou.

Roads also introduce dust, pollution, non-native plants, salt and vehicle exhaust into an area. Increased vehicle use may result in collisions with wildlife. Roads provide better opportunities for



Trans-Alaska Oil Pipeline

Photo: Ken Waitsen



Photo: Dieter Garte

Pipeline right-of-way

hunters and poachers to enter an area and can result in an increase in the number of animal deaths.

### Pipelines and Seismic Lines

The increase of human access into new areas on seismic lines and pipelines can lead to an increase in hunting, trapping and poaching, as well as increased harassment of animals from snowmobiles and all terrain vehicles.

In Northern Alberta there is an intensive network of linear developments, and this is having a serious impact on woodland caribou populations. In general, caribou that have home ranges closer to linear developments tend to be at higher risk of attack by predators. Wolves travel faster on linear developments, which may improve their ability to catch prey.

Wildlife show a wide variety of reactions to pipelines. Moose may cross over and under a pipeline, while caribou may avoid low sections of elevated pipe.

Some birds of prey use elevated sections of pipeline for their nests. These areas are good for hunting because dust clouds from the road beside the pipeline settle on the snow, causing it to melt more quickly in the spring. Once the snow is gone, vegetation and small mammals return earlier than in other areas.

It is hard to say what the impact of linear developments will be on all wildlife populations; some adapt while others do not. There are many factors that affect how an animal will react, including the type of linear development and the time of year.



Seismic lines. Eagle Plains, Yukon Territory.

Photo: Geoff Stummer



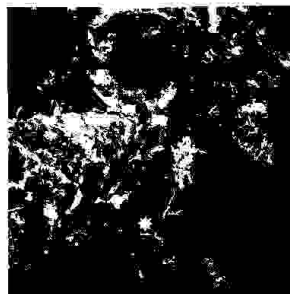
New technique seismic line. Eagle Plains, Yukon Territory.

Photo: Geoff Stummer

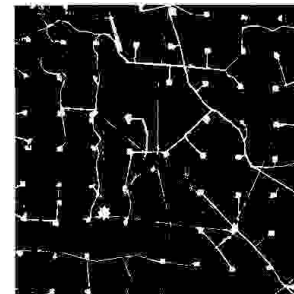
### What about the cumulative impacts of linear developments?

The pictures below show the impact of cumulative linear developments over a 50 year period around Swan Hills, Alberta:

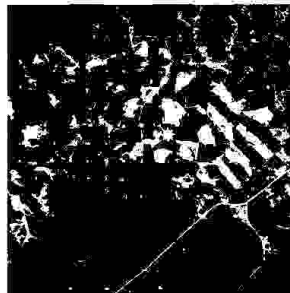
Aerial View of area surrounding Swan Hills, Alberta over 50 years



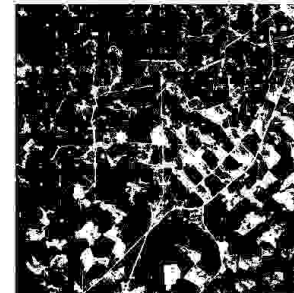
Aerial view Swan Hills 1949  
Pristine wilderness - no development



Aerial view Swan Hills 1964  
Oil and gas development and corresponding roads



Aerial view Swan Hills 1982  
More oil and gas development, forestry clear cuts and corresponding roads



Aerial view Swan Hills 1991  
More oil and gas development, more forestry clear cuts and corresponding roads

\*Use star as reference point

Linear developments contribute to cumulative impacts in a number of ways. Roads (and the networks they create) provide economical access for other industries. This may make the development of forestry, mining and other activities in the area more affordable.

### Key Issues:

- Increased access may have the largest impact on wildlife in the Yukon. Roads create easy access into areas once difficult to travel into; all-terrain vehicles and skidoos can be driven along seismic lines and pipeline right-of-ways. The primary concern this raises is potential increases in hunting, poaching and harassment.
- Animals may avoid the areas where the best food is. This may cause them to be less healthy because they are eating food that is not as nutritious.
- Animals may have trouble crossing pipelines and other linear developments
- Animals may change their migration routes because of linear developments (i.e. seismic lines) and structures (i.e. elevated pipelines) on the land.
- There is a lack of regulations and man power to control access issues.
- There is a lack of baseline data to compare the post-pipeline data to previous "natural" conditions.
- All of these linear developments together may result in less habitat.



Photo: Niki Wilson

Old parallel roads, Eagle Plains, Yukon Territory.

This information is taken from the Yukon Fish and Wildlife Management Board publication titled *The Effects of Oil and Gas Industry Activity on Fish and Wildlife: a review of selected literature*. To obtain a copy, call (867) 667-3754, or visit [www.yfwmb.yk.ca](http://www.yfwmb.yk.ca).