



TRANSPORTATION FACTS – Impacts on Nature

Land

- Humans have altered the structure of many of the world's ecosystems. They have cut down forests, plowed soils, used rangelands to graze their domesticated animals, introduced non-native species to many regions, intensively fished lakes, rivers and oceans, and constructed dams. These relatively recent changes in the structure of the world's ecosystems have made them less resilient to further changes.
- It is likely that many ecosystems will not be able to adapt to the additional stress of climate change without losing some of the species they contain or the services they provide, such as supplying sufficient clean water to drink, food to eat, suitable soils in which to grow crops, and wood to use as fuel or in construction.)
- Over the next century, global warming could result in approximately one-third of the Earth's forested area undergoing major transitions in species composition. From the fossil record we have an indication of the maximum rate at which various plant species have migrated to more suitable areas; from 0.04 km/yr (about 0.03 miles/yr) for the slowest to 2 km/yr (about 1.3 miles/yr) for the fastest. However, the projected rate of surface temperature change in many parts of the world could require plant species to migrate at faster rates (1.5 to 5.5 km/yr or about 1 to 3.5 miles/yr). Thus, many species may not be able to move rapidly enough to prosper. These changes in vegetation and ecosystem structure may in turn give rise to additional releases of carbon into the atmosphere, further accelerating climate change.
- Moreover, as the old vegetation dies in areas most affected by climate change, such as forests in northern latitudes, it is likely to be replaced by fast growing, often non-native species. These species commonly yield less timber, provide lower quality forage for domesticated animals, supply less food for wild animals, and furnish poorer habitat for many native animals. The prevalence of pest species, such as weeds, rats, and cockroaches, may also increase.

(Source: "Why Can't Ecosystems Just Adapt?" Common Questions About Climate Change; US Global Change Research Information Office – Global Change Resources; <http://www.gcrio.org/ipcc/qa/11.html>)

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Air

- Transportation is the single largest source of GHG emissions in Canada, accounting for about 25% of Canada's total emissions in 1997. The sector also accounted for the largest share of the growth of emissions between 1990 and 1997. (Source: Government of Canada. *Climate Change 2000 Backgrounder*. February 2000; "Vision and Balance: Report of the Canada Transportation Act Review." June 2001. Minister of Public Works and Government Services Canada.)
- The largest single source of air pollution in BC is transportation. Provincially, transportation accounts for: (based on 1990 data, primary particulate emissions only)
 - 49 percent of carbon dioxide emissions
 - 50 percent of nitrogen oxide emissions
 - 34 percent of carbon monoxide emissions
 - 30 percent of hydrocarbon emissions
 - 9 percent of particulate emissions(Source: Province of British Columbia, Ministry of Environment, Lands and Parks. 1995. "Clean Vehicles and Fuels for British Columbia: A Policy Paper.")
- The transportation sector is the fastest-growing source of the world's carbon emissions. Road traffic, which accounted for 58 percent of worldwide transportation carbon emissions in 1990, claimed 73 percent in 1997. (Source: French, Hilary and Mastny, Lisa. *State of the World 2001*, Oxon Hill: World Watch Institute, 2001.)
- Tailpipe exhaust accounts for an estimated 41 percent of nitrous oxides found in air across Canada, 19 percent of volatile organic compounds, 38 percent of carbon monoxide, 53 percent of benzene, 25 to 30 percent of microscopic soot particles, and up to 60 percent of sulphur dioxide. These are average figures: The concentrations in congested cities are far higher. (Source: "Why this B.C. doctor says cars are killers." *Vancouver Sun*. 19 May 2001.)
- Transportation is the single largest source of GHG emissions in the province; and GHG emissions from gasoline and diesel cars and trucks increased by almost 20% from 1990 to 1997. (Source: British Columbia, Ministry of Environment, Lands and Parks. 2000. "Environmental Trends in British Columbia 2000.")

Water

- Of the 595 streams assessed in the settlement areas of the Lower Fraser Basin, 20% had been lost, 63% were endangered, 16% were threatened, and only 6% were in their original wild state. (Source: Precision Identification Biological Consultants, *Wild, Threatened, Endangered, and Lost Streams of the Lower Fraser Valley, Summary Report, 1997* (Vancouver, BC: Fraser River Action Plan, 1998), p. 5.)
- Glaciers in southern British Columbia retreated during the 20th century. Lakes and rivers now become free of ice earlier in the spring, and the Fraser River is discharging more water earlier in the year. These trends point to lower summer flows in some streams and rivers, and less water for agriculture, hydroelectric power

generation, industry and communities. This may pose significant problems in drier regions such as the Okanagan, where water is already in short supply. (Source: http://www.climatechange.gc.ca/plan_for_canada/climate/bc.html)

- The average summer temperature of the Fraser River increased by 1.1°C over the past 50 years. A warmer climate may pose problems for salmon as they migrate upriver to spawn. Salmon are sensitive to temperature; warmer water can deplete their energy reserves, and make them more vulnerable to stress, infection, and disease. If summer river temperatures continue to rise, fewer fish may make it successfully upriver to their spawning grounds, and some salmon populations may be at risk. (Source: http://www.climatechange.gc.ca/plan_for_canada/climate/bc.html)
- Sea levels rose along most of the BC coast during the 20th century. Higher sea levels increase the risk of flooding in low-lying coastal areas. They may inundate wetlands, beaches, dunes, and other sensitive coastal ecosystems, and threaten Aboriginal heritage sites. They may also create drainage problems and overwhelm municipal sewage systems. Low lying agricultural lands may become too saline for cultivation. Waterfront homes, wharves, roads and port facilities may be at risk during severe storms. (Source: http://www.climatechange.gc.ca/plan_for_canada/climate/bc.html)
- Since 1991, 1,052,000 tonnes of oil has been spilt by tankers around the world. Between 1974 and 2000, there were over 9100 oil spills. (Source: <http://www.itopf.com/stats.html>)
- The amount of petroleum products ending up in the ocean is estimated at 0.25% of world oil production: about 6 million tons per year. (Source: http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/shuttle_oceanography_web/os_s_122.html)
- Pipeline spills reported to the U.S. Department of Transportation average 12 million gallons of petroleum products a year. That is more than the Exxon Valdez oil spill.
- The US EPA says that more than a quarter of the nations' one million underground gasoline and oil tanks leak.

Wildlife

- Motorists kill nearly 300 million road animals annually in the US. (Source: <http://www.api4animals.org/doc.asp?ID=680>)
- In Washington State, Department of Transportation (DOT) workers each year pick up between 2,450 and 3,000 dead deer and elk. (Source: <http://archives.seattletimes.nwsource.com/cgi-bin/texis.cgi/web/vortex/display?slug=roadkill09m&date=20020609>)

- Humans actively and productively use and manipulate large portions of the land surface of the Earth, whether it be for agriculture, housing, energy, or forestry. These practices have created a mosaic of different land uses and ecosystem types, resulting in fewer remaining large and contiguous areas of a single type of habitat than existed in the past. Therefore it will often be difficult for plants and animals to move to a location with a more suitable climate even if a species was able to migrate quickly enough. (Source: "Why Can't Ecosystems Just Adapt?" *Common Questions About Climate Change*; US Global Change Research Information Office – Global Change Resources; <http://www.gcrio.org/ipcc/qa/11.html>)