

Garry Oak Ecosystem Decline

Canadian Garry oak ecosystems are located on the southeast coast of Vancouver Island, in nearby Gulf Islands, and in two small strands in the Fraser River Valley. These ecosystems arose during a warm interval 7,000 to 10,000 years ago, and at this time there were two types of Garry Oak ecosystems. Deep soil sites, which consisted of many shrubs, trees, grasses, and wildflower meadows; and shallow soil sites- many of which were on rocky areas and were surrounded by spring flowers, grasses and mosses (GOERT, 2005) Due to a number of pressures and management changes, approximately 1/3 of the Garry oak ecosystems that once existed in the Nanaimo and Nanoose areas remain today (Lea, 2006).



Garry Oak Tree Pipers Lagoon

The main threats to the Garry oak ecosystem include:

- Habitat loss
- Fragmentations of land areas creating smaller, more vulnerable patches
- Fire suppression leading to the encroachment of wood species
- Introduction of invasive species
- Disease

(GOERT, 2005)



Map © Province of British Columbia

Habitat Loss and Land Fragmentation:

According to a survey by Lea, in the area including Nanaimo and Nanoose 29 ha of the deep soil Garry oak ecosystems existed in 1800, and almost all of these ecosystems remain today. Other areas of Vancouver Island have a retainment level of 1.5 percent (Lea, 2006). Many of the deep soil sites were cleared for farming when the European settlers arrived on Vancouver Island. Other land development has also contributed to the loss and fragmentations of Garry oak ecosystems, as infrastructure was built in the location of Garry oak ecosystems, dividing the remaining sections of the ecosystem into smaller, fragmented sections. In comparison to large intact ecosystems, fragmented ecosystems are much more vulnerable to human disturbance, disease, predation, and weather (GOERT, 2005). In Nanaimo and Nanoose, 31 percent of the shallow soil Garry oak ecosystems remain, this is lower than the Vancouver Island average of 44 percent (Lea, 2006). This is because many of these Garry oak ecosystems were growing on prime real-estate areas close to the water or rocky outcrops. The difficulty of developing on some of these outcrops has allowed small portions of the Garry oak ecosystems to survive.

Fire Suppression:

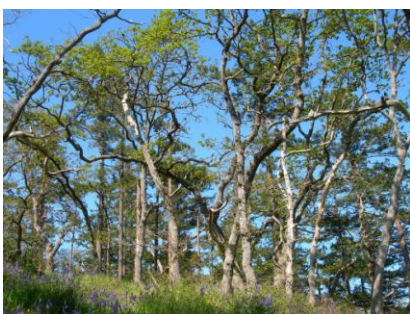
Regular controlled burnings of camas beds within the Garry oak meadows were practiced by the First Nations people. These fires prevented tree seedlings and shrubs from becoming established in the Garry oak meadows, maintaining an open canopy. The fires also promoted the production of camas, which was a food source for the people in the area. Fire suppression followed European Settlement drastically changing the structure and composition of the Garry oak ecosystems, allowing closed-canopy woodlands and conifer forests to grow in areas that were once Garry oak meadows (Fuchs 2001). Douglas-firs grow and shade the Garry oaks, and shrubs to take over the wild flower meadows and other species (GOERT, 2006).

Invasive Species:

The introduction of the invasive species Scotch broom, gorse pose, English ivy, Himalayan blackberry, daphne, several grasses, European starlings, grey squirrels, gypsy moths, and others, are more successful, out-competing the native that lived in the Garry oak ecosystem (GOERT, 2006). These invasive species shade out the Garry oak groves and prevent the native plants and animals which were part of the Garry oak ecosystems from thriving in this environment. Without the ecosystem, the Garry oak trees become more susceptible, and therefore decreasing their survival rate. Many introduced insects and animals also contribute to the decline of Garry oaks ecosystems. The Acorn Weevil and the Filbert worm consume a large portion of the acorn crop. The European starling and the eastern grey squirrel eat the acorns from the Garry oaks. Other introduced species including the black slug harm rare plants that make up the Garry oak ecosystems.

Disease:

Another possible threat to Garry oak trees is *Phytophthora ramorum*- a fungal-like pathogen contributing to a disease know as 'Sudden Oak Death' (SOD) that has been spreading in coastal areas of North America. So far, Garry oak trees have not been affected, but several other oak species are shown to be prone to the disease (GOERT, 2006). SOD is a disease which as many as 56 plant species. In the spring of 2004, *Phytophthora ramorum* was discovered on some Camellia plants imported to Canada from a nursery in California. The province of BC launched a public recall in an attempt to prevent the disease from spreading. Although this recall was successful, SOD exists outside of BC in the US and Canada and since 2004, it has been detected on a small number of plants in BC nurseries (Garden wise, 2006). This suggests that SOD may become more prevalent, possibly affecting the remaining Garry oak ecosystems in Canada.



Garry oaks in Nanaimo, BC

As global warming progresses, the Garry oak ecosystems may become more important possibly replacing Douglas fir forests, as the species within the Garry oak ecosystems are well adapted to a warm climate with an expanded summer drought (GOERT, 2006). It is predicted that by 2050, the temperatures in Nanaimo will rise approximately 2-3 °C (Hebda 1997), in reflection of this, Garry oak ecosystems will become a more prominent part Nanaimo's landscape (Fuchs 2001).

Garry oak meadows provide habitat, food, breeding and nesting grounds for more than 150 vertebrates in British Columbia. Shepard's

1998 study, found that the bird diversity is higher in Garry oak woodlands than in Conifer forests in BC. This finding is an indicator of the importance of the Garry oak ecosystem for the bird diversity for BC (Shepard (M.G.) 1998, Feldman 2000, Fuchs 2001). Over 690 plants have been identified in Garry oak ecosystems in BC, 61 of these plants are at risk, including 11 plants which are at risk nationally and 12 which are at risk globally. Many insects and animals are also at risk due to habitat loss.

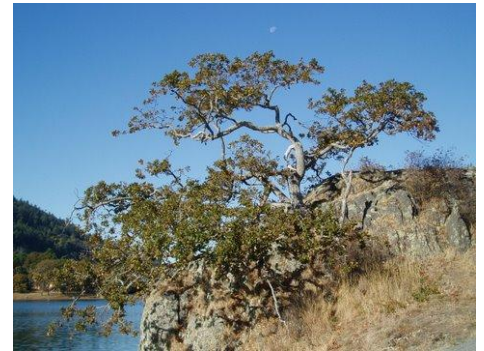
In Nanaimo and Nanoose, an overall 33 percent of the Garry oak ecosystems present in 1800 remain (Lea, 2006). Harewood Plains and Harmac/Joan Point there are remnants of shallow Garry oak ecosystems that are relatively intact. These areas contain several rare plants that are significant provincially and nationally (GOERT, 2006). According to GOERT, Harmac and one park in Victoria are the only locations in Canada where Muhlenberg's centauray, a perennial herb plant, has been found. The seven remaining Canadian populations of bog bird's-foot trefoil, another perennial herb, are found exclusively in the Nanaimo area. "Experts currently rank Harewood Plains as the highest priority Garry oak ecosystem site on Vancouver Island for conservation" (GOERT, 2006). Therefore, it is particularly important that the Garry oak ecosystems remaining in Nanaimo are taken cared for and protected.

For more information on Garry oak ecosystems visit these websites:

Garry oak's problems: <http://www.geocities.com/RainForest/8132/problems.html>

Garry Oak Ecosystem Recovery Team <http://www.goert.ca/>

Saanich Garry Oak Restoration Project <http://www.goert.ca/>



Garry oak at Pipers Lagoon

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