

Cowichan Region State of the Environment Report Update 2014

Invasive Species





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The 2014 State of Environment Update Report has been prepared by the Cowichan Valley Environment Commission’s State of Environmental Reporting Subcommittee, chaired by Scott Akenhead.

Research, writing and design by Judith Cullington & Associates: Judith Cullington, Jenny Farkas (Taiji Brand Group) and Rachel Holt (Veridian Ecological Consulting Ltd.).

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Introduction

Invasive species are plants, animals and micro-organisms that tend to rapidly colonize new areas, and therefore can take over the habitats of native species. Most invasive species are also alien (non-native) to an area and can become dominant often because they reproduce and spread rapidly, because natural population controls (e.g., predators, disease) are not effective in a new location, or because they are encouraged by human populations due to their aesthetics or utility.

Invasive plants and animals are identified as one of the primary threats to biodiversity world-wide and these species continue to expand and move into new areas around the planet. The Global Invasive Species Program¹ has identified a list of the “top 100 world’s worst” invasives. The top 20 species includes a diversity of species including insects (five species), trees (two species), a bird, mammal, grass, reptile, amphibian, seastar, water mould, fungus, crustacean, alga, and a virus.

What constitutes an invasive species can be difficult to discern as species move around the globe both under their own steam and often alongside human movements. Many hundreds, if not thousands, of “new” species have been introduced to the Vancouver Island region since the arrival of Europeans. Many of these species are now considered ubiquitous and their ecological effects largely ignored (e.g. starlings, earthworms and domestic cats).

Climate change is expected to further exacerbate the spread of species around the globe and the difficulty of categorization will increase as many species are already found to be actively reflecting shifts in climate, both in terms of life-history and in location as species move into and away from more and less favorable climates. The ecological influences of invasive species will compound the already significant direct impacts of climate change and other stressors on natural ecosystems.

1 <http://www.issg.org/database/welcome/>

CVRD Strategic Goals

The Cowichan Valley Regional District (CVRD) [Strategic Plan](#) identifies the development of an invasive species action plan as a strategic action under its goal of Healthy Environment., focusing primarily on plant species.

A [draft Invasive Species Strategy](#)² has been prepared, identifying the nine most important plant species for action within the CVRD and regulatory and non-regulatory approaches for managing invasive plants. In addition, guidance has been delivered to local government staff within the CVRD that highlights issues with disposal of key invasive species to help reduce further accidental spread.

The CVRD is a member of the Coastal Invasive Species Committee³ (Coastal ISC). Coastal ISC partners represent diverse stakeholders throughout Vancouver Island, the Gulf Islands and the Sunshine Coast. Their vision is that:

“Communities, resources and ecosystems in the Coastal Invasive Species Committee area are protected from the negative effects of impacts from alien invasive species.”

Since 2010, the Coastal Invasive Species Committee has expanded its work from inventory and education to more on-the-ground treatments and direct action of priority invasive species locally.

Key activities within the CVRD in the last five years include an inventory of the Shawnigan Lakes Park, and ongoing inventory and treatment efforts for key priority species (Japanese Knotweed and Giant Hogweed), particularly along the TransCanada Trail and in the vicinity of the Cowichan River.

This report primarily focuses on plant species as these are the most known species. Reliable data for trends in invasive animals are unavailable at this time.

2 <http://www.cvrld.bc.ca/DocumentCenter/View/64724>

3 <http://www.coastalisc.com/>

Measuring Invasive Plants

The Coastal Invasive Species Committee monitors invasive species within the CVRD and data on invasive plants are held by the Province through the Invasive Alien Plant Program (IAPP).⁴ The Coastal ISC produces a priority species list which focuses attention for both monitoring and treatment of invasive plants.

This update report focuses on the number and area of invasive plant species within the CVRD. A steady effort has improved the data available on invasive plants since 2010. Part of the ‘apparent increase’ in invasive plants is a reflection of the increased inventory work.

The scope of the invasive plant issue continually expands. Understanding and dealing with the two-pronged issue of existing invasive species sites, combined with the slow creep of new locations of sites for relatively low-density but fast-spreading species, requires a constant and significant effort. This effort has slowly been increasing within the CVRD.

In addition to surveys, mechanical and chemical treatments for invasive species have been ongoing within the CVRD. A summary of treatments is presented as an example of the effort focused on this issue over time.

Findings

Number of Species within the CVRD

The number of species of invasive plants found within the Cowichan Valley Regional District is listed in 2014 at 72. This is a sharp increase from the minimum number of 30 reported in 2010 (data from 2009). In addition, the number of mapped invasive species plant sites has increased from around 2,000 sites in 2009 to just over 5,000 sites in 2014, with an increase in total area affected rising from 909 ha to 1,093 ha—an increase of 20% in less than five years (Table 1).

Table 1: Indicators of invasive species spread in the CVRD. 2009 – 2014

Indicator	2009	2014
Number of species listed	30 +	72
Total number of mapped sites	2,000	5,019
Area of mapped sites (ha)	909	1,093

There are two explanations for the data trends shown.

- There is a continual real spread of invasive species with new colonization of sites, and an increase in the number of species relevant to the CVRD—a cause for alarm in regard to some species and particular ecosystems.
- Part of the increase results from greater monitoring effort, more stringent reporting to the IAPP database and continued effort by the Coastal ISP and their staff, contractors and volunteers. This reflects increased effort rather than actual increases in invasives. The extent to which the 20% increase is a result of increased effort rather than actual spread is unquantified at this time.

The most significant invasive plant species in the IAPP database, by area, are Scotch Broom, Canada Thistle, Himalayan Blackberry, St Johns’ Wort, Oxeye Daisy, Bull Thistle, Common Tansy, Japanese Knotweed, Yellow Iris, Tansy Ragwort, and Curled Dock—all of which are noted as affecting more than 100 ha each. This is a slightly different list of “most significant species by area” than was seen in 2009, though the shifts seen are likely to be primarily a result of more systematic inventory of some of the more common species than previously.

Traditionally, the most ubiquitous species are often overlooked as being impossible to monitor or react to, and so have tended to be under-represented in data sets. It is well understood that the actual area affected by invasive species is much higher than the 1,094 ha identified in this dataset.

The doubling in the number of species noted within the CVRD is also likely to be explained in part by increased effort and the more systematic inventory approach being taken. However there are also ‘new species’

⁴ <http://www.for.gov.bc.ca/hra/Plants/>



“People often ask, are we getting ahead of the invasive species issue? Yes we are! Our cheapest and most effective tool is prevention. Each year we have more people calling to report invasive species and we have more communities and local governments on board. The awareness is building, as well as the action behind it. Is there more we can do? Yes, often overlooked is the responsible disposal of invasive species. Do not compost. Working towards responsible and incentive based disposal option is one of the keys to closing the loop on this issue.”

Rachelle McElroy, Executive Director, Coastal Invasive Species Committee.

identified, and many new known sites, within the CVRD within the last five years, so concluding that the situation continues to worsen with respect to invasive plants is a reasonable one.

Distribution of Species within the CVRD

As noted in the 2010 State of Environment Report, the distribution of invasive species is primarily in the drier ecosystems on the east side of the Cowichan Region, with most species found in the dry and very dry Coastal Western Hemlock zones and in coastal Douglas-fir and Garry Oak

ecosystems. Most of these are roughly within 15 km of the shoreline on the east side of the region. However, there are significant densities of invasion sites along the Cowichan and Chemainus Rivers and their tributaries, with specific spread of Japanese Knotweed noted along the riparian area of the Cowichan River.

As previously, the western ecosystems of the Cowichan Region are less affected by invasive plant species, likely a result of the combination of wetter, shadier ecosystems that are harder to invade, and the lower level of human infrastructure that is often the major driver for invasive species incursion.

Priority Species

The Coastal ISC, in concert with the B.C. Government, maintains a list of priority invasive plant species, classifying key species into a variety of categories that receive different management focus (Table 2). Using an “Early Detection Rapid Response” approach the priority plant list helps to identify which actions can be taken to prevent establishment of new species in an area.

Table 2: Priority actions for the Coastal Invasive Species Committee Region, including CVRD. 2014.

Description	Action Category	Example species	Mapped occurrences in the CVRD Oct 2014
Species not known to occur in the region, but likely to establish if introduced. Eradicate if found.	Prevent	Flowering Rush Leafy spurge*	*1 site, <1ha
Species known to occur in limited distribution and low density. Eradicate if found.	Eradicate	Garlic mustard Giant hogweed* Dalmatian toadflax**	* 33 sites, <1ha ** 43 sites, <1ha
Established infestations found in portions of the region. Contain existing infestations and prevent spread to un-infested areas.	Contain	Yellow Flag iris* Gorse**	* 188 sites, >27 ha ** 27 sites, 2ha
Established infestations common and widespread throughout the Capital Region. Focus control in high value conservation areas. Use biological control if available, on a landscape scale.	Control	Butterfly bush* Canada thistle** Himalayan blackberry***	* 2 sites, <1ha **599 sites, 74ha ***498 sites, 198ha



Figure 1: Distribution of invasive plants – east side of the CVRD.



Data from IAPP.



Figure 2: Distribution of invasive plants – west side of the CVRD.



Data from IAPP.



The priority plant list below reflects Coastal ISC regional status rather than specific CVRD priorities but shows a regional trend of issues as relevant context for the CVRD. A regional district-specific risk assessment has been undertaken and specific priority management species and strategies are listed in Table 3.

The CVRD data on Gorse (Table 2) demonstrates how wide-spread or ‘accepted’ species such as Gorse that have become largely ubiquitous are not well reflected in the datasets (the data suggests there are 27 sites and 2 ha of Gorse within the CVRD). Efforts are being made to update these

data, but currently the IAPP data tend to not accurately reflect the actual status of widespread species.

Japanese Knotweed

Often called ‘false bamboo’ this highly aggressive species which originated in Japan, Korea and Taiwan, was introduced originally as a garden ornamental species and forms dense thickets of stems from underground shoots. It can grow at an astonishing 8 cm per day! and has been known to grow through slabs of concrete affecting basements, houses and roadways.

Table 3: Priority species for the Coastal Invasive Species Committee Region, including CVRD, 2014.

Species	Management Category	Classification under Weed Control Act	Total Area (ha) – All CVRD jurisdictions	Ecological Risk	Human Health Risk	Economic Risk	Overall Risk Score	Overall Assessment
Giant Hogweed	Eradicate	BC Noxious	1.1	High	High	High	6	BC Noxious weed and high priority in the CVRD
Yellow Iris	Contain	BC Noxious	34.4	Medium	High	High	5	
Daphne / Spurge Laurel	Contain	BC Noxious	7.7	Medium	High	High	5	
Blessed Milk Thistle	Eradicate	BC Noxious	0.01	Medium	Medium	High	4	
Knotweed Species	Eradicate	BC Noxious	38.0	High	Low	Medium	3	
Carpet Burweed	Eradicate	BC Noxious	0.02	Medium	Medium	Medium	3	
Tansy Ragwort	Control	BC Noxious	28.6	Medium	Medium	Medium	3	
Poison Hemlock	Contain		0.0005	High	High	High	6	High priority in the CVRD
Scotch Broom	Control		404	Medium	Medium	High	4	
Scotch Thistle	Eradicate	BC Noxious	7.3	Medium	Low	Medium	2	BC Noxious Weed
Gorse	Eradicate	BC Noxious	2.1	Medium	Low	Medium	2	
Spotted Knapweed	Control	BC Noxious	3.4	High	Low	Low	2	
Kudzu	Prevent		0	Low	Low	High	2	CISC priority
Butterfly Bush	Eradicate		0.01	Medium	Low	Low	1	
Spartina	Eradicate		0	Low	Low	Low	0	
Garlic Mustard	Eradicate		0	Low	Low	Low	0	

Data accessed 2013 – some discrepancies from the area totals in the 2014 Coastal ISC data in Table 1.



Since 2010, Japanese Knotweed has expanded its range and is of particular concern along the riparian zone of the Cowichan River. The species spreads primarily by its roots and is often transported to new sites by humans. Small pieces of the plant can root, even if buried to 1 m or more, and create new colonizations with incredible speed.

Early efforts at treatment for this species in the CVRD, which began in 2006, may have resulted initially in its further spread along the Cowichan River. In this environment, herbicides cannot be used to control species since they also negatively affect natural species in this sensitive environment. Mechanical removal of the plant is very difficult and strict controls are needed to ensure that small pieces of the plant are not left or moved to new sites. Best practices for treatments have been improved and work is ongoing within the CVRD to more fully understand the issue of disposal of species such as Japanese Knotweed.

Coastal ISC has noted a great need to develop an “aquatic friendly” herbicide that could be used to control this very aggressive species.

Giant Hogweed

Giant Hogweed is a species of concern found within the CVRD. Originally native to Central and Southwest Asia, this species has invaded on both the eastern and western coasts of North America. Growing in excess of 4.5 m (15 ft) tall, it has typically invaded disturbed sites such as open fields, roadways and areas such as the Trans-Canada Trail, but is capable of invading riparian areas in natural systems and it is found in some of these systems within the CVRD. It has both ecological functioning and human and animal health implications. Ecologically, it crowds out other native species and fundamentally alters ecosystem structure. In addition, skin contact with this species causes extreme light-sensitivity which can result in significant burns and can cause temporary and sometimes permanent blindness with direct contact to the eyes.

The distribution of Giant Hogweed in B.C. is primarily limited to the south coast area, with a couple of known sites in the West Kootenay.

New Species of Concern

Another new threat is Jimsonweed. This species is an annual herb found in much of southern Canada, but is currently not widely known on Vancouver Island. However, new records for this species are being found in the region. It is of concern for its ecological impacts of being rapidly spread, but is of particular note because it is highly toxic and causes delirium and possible death if eaten. This species is spread primarily through movement of soil between sites and this problem highlights the current lack of controls on soil movements and lack of regulation about what can be found within soil sold for garden or commercial use.

Treatment of Invasive Plants within the CVRD

The Coastal ISC manages a treatment program for priority invasive species that has been active over the last number of years on provincial land and transportation corridors (hydro and gas). Most treatments were performed mechanically (75 ha) compared to chemical treatment (2.5 ha). Figure 4 shows the area treated mechanically by year and by species – most treatments were in 2009 and in 2014. Chemical treatments is shown in Figure 5—60% of which was applied using backpack application, but also included stem injection methods.



Figure 3: Distribution of Giant Hogweed in Vancouver Island and the Lower Mainland

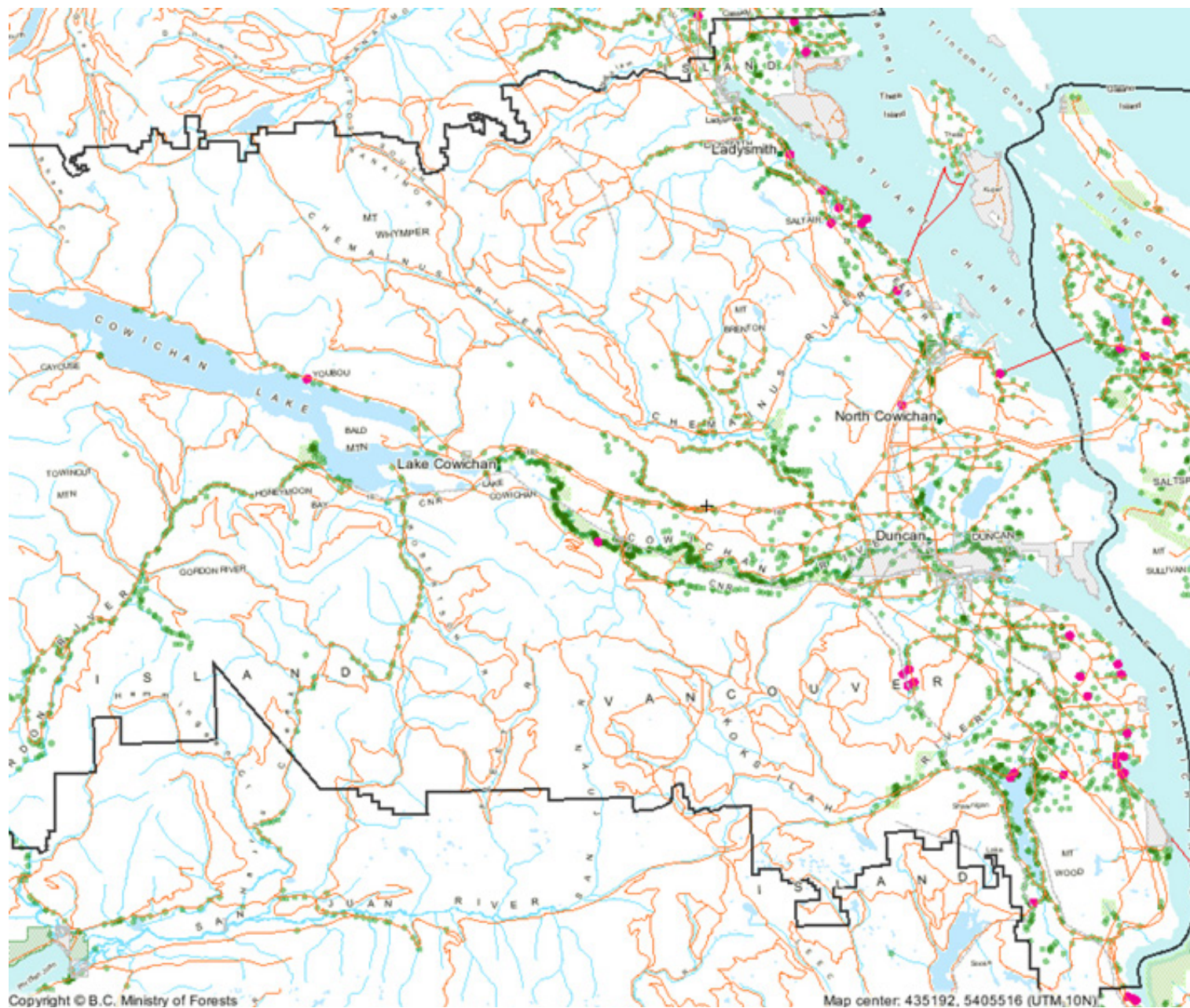




Figure 4: Area treated by mechanical methods from 2009 to 2014, by species.

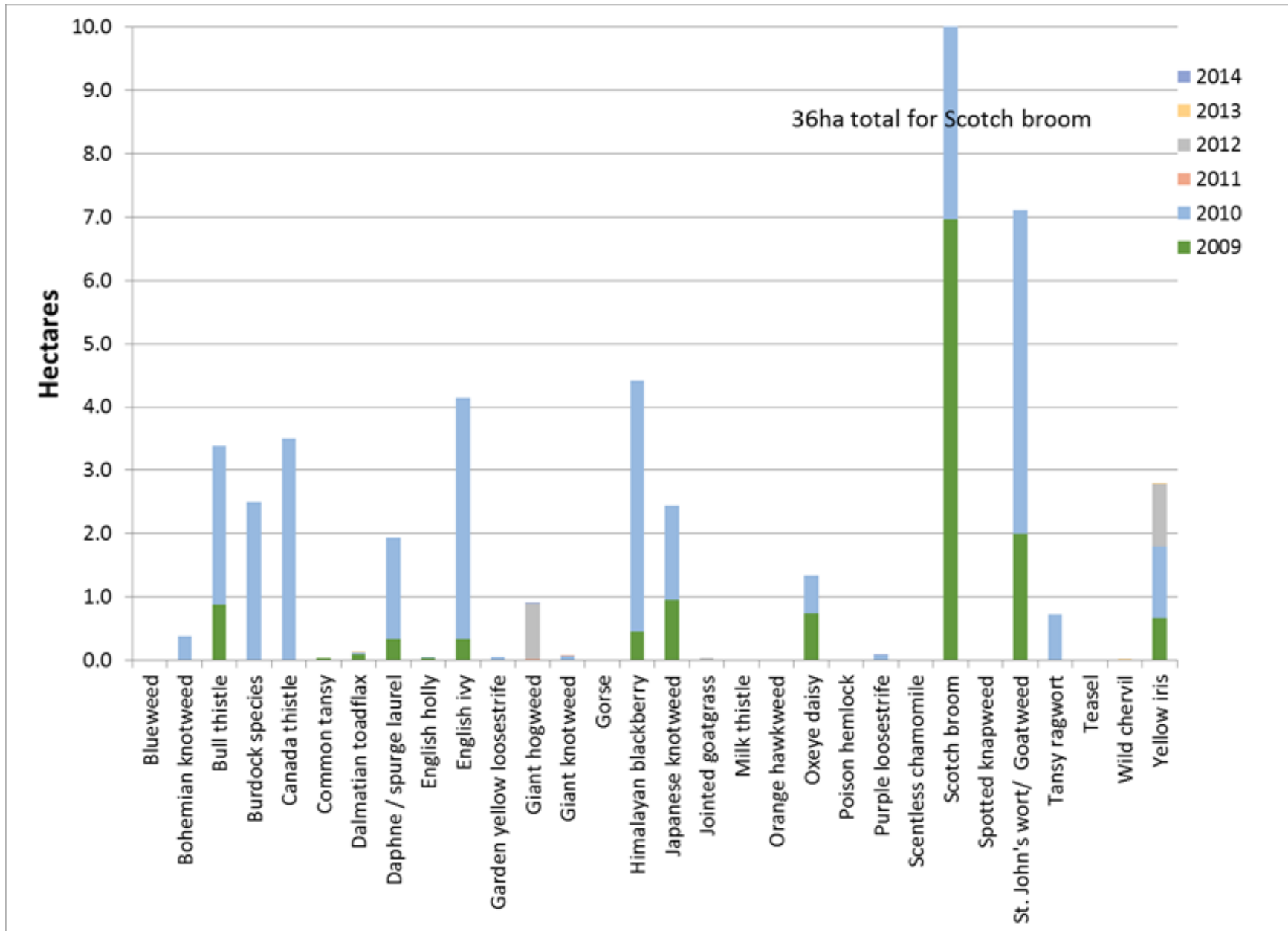
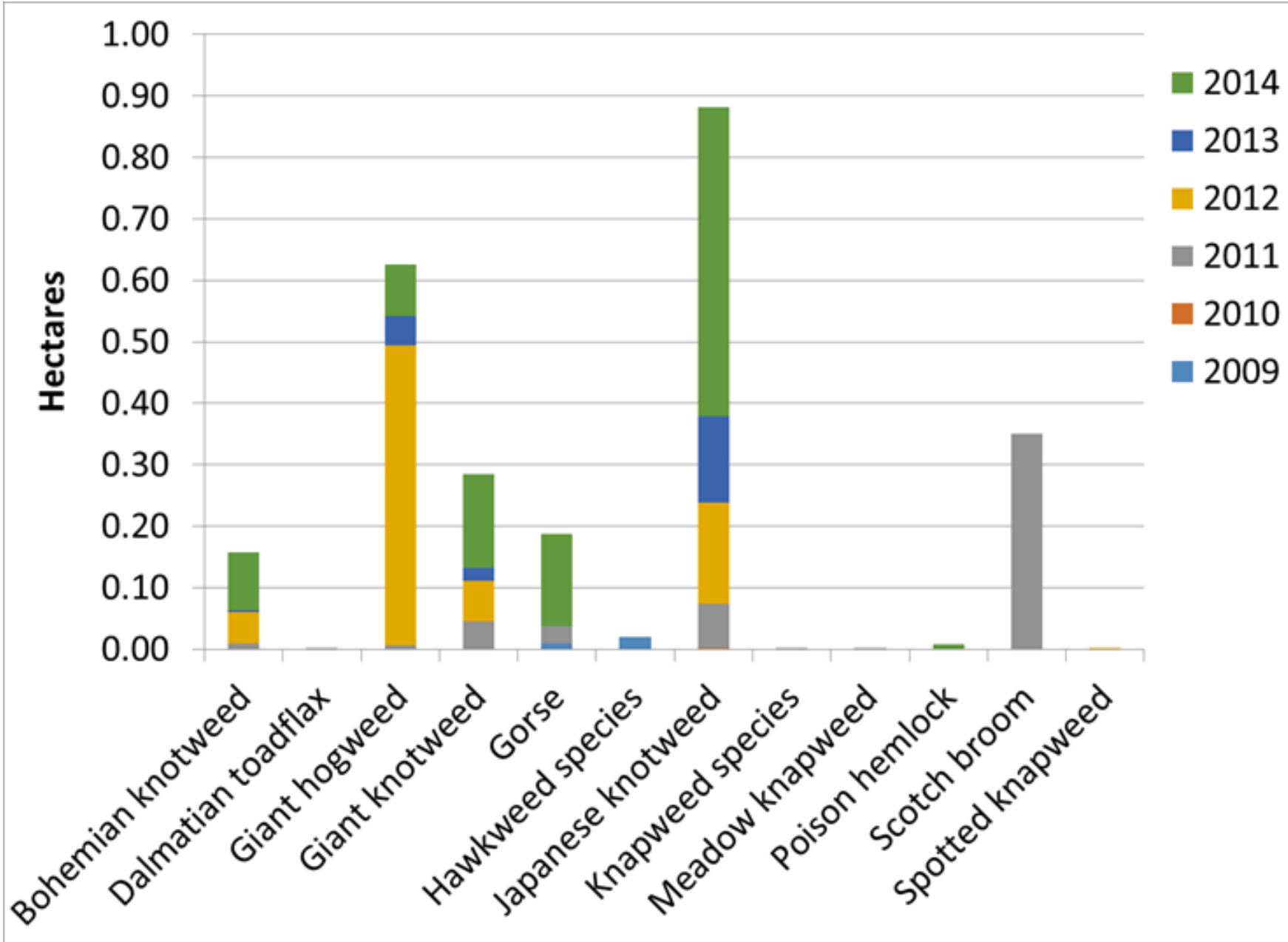




Figure 5: Area treated by chemical methods from 2009 to 2014, by species.





Invasive Animals

As with plants, there are a large number of invasive animals on Vancouver Island and in the CVRD, and many species have effectively become ‘naturalized’ – with their ecological impacts largely ignored today. Such species include domestic species and feral species (e.g. rabbits, cats) and common species such as the grey squirrel. Most of these species are not tracked or managed, even though their ecological impacts are often very significant (see 12things.ca 2010).

In addition to the ‘baseline’ of known species, there are a number of ‘new’ species of concern locally.

The European Fire Ant was noted in 2010 as having the potential to be a species of great concern in the southern coastal region of British Columbia. It is known to be found within three local municipalities within the broader coastal region, including within the Capital Regional District, though it is not yet currently identified within the CVRD.

Marine and freshwater environments are also affected by many invasive or novel species. A number of ‘new’ species of concern were identified in the 2010 report, including bullfrogs and green frogs which are a significant invasive species in freshwater ecosystems on Vancouver Island. However, there is no provincially-led monitoring or funds to manage these species which can cause potentially massive ecological impacts in the local region. Effective treatment programs are still in development.

In 2010, the New Zealand mudsnail was identified as a potential threat to the CVRD. As yet still unknown in the CVRD, the species has been rapidly spreading elsewhere in local marine and freshwater ecosystems. For example, in Puget Sound systems in Washington, the species has been observed rapidly spreading and a work has been undertaken to identify those stream systems most at risk. Best management practices to prevent the spread of mudsnails are identified in King County WA, but methods for eradicating the species are unknown to date. In B.C., a population is

now established in Port Alberni and monitoring efforts are underway to establish whether this is an isolated population. The mudsnail is of great concern as they can reach massive densities of individuals – up to 300,000 per square metre, and it is a very resilient species, easily spread and prevents habitat use by native species. There are no regulations in B.C. to prevent spread of the species to other locations.

The marine environment is also affected by another new ‘species’ – the sea star wasting syndrome – which has been identified locally from Port Hardy to the southern Gulf Islands in southern B.C., and has had devastating impacts on populations of echinoderms (sea stars and sunstars) along the entire Pacific coast of North America. Identified in the summer of 2013 in southern B.C., significant and rapid mortality of these key intertidal predators has been observed with millions of individuals dying through ‘wasting away’. The root cause is not yet confirmed – but some kind of novel pathogen, possibly a virus, is thought to be the agent. It is speculated that climate change and the warming of ocean waters is allowing spread of pathogens into new areas. Research is underway to understand the cause and effects, but the ecological impacts of removing a key predator from an ecosystem are likely to be very significant.

Except for these anecdotal examples of invasive animals in the region, there are no systematic updates since no agencies systematically report on or manage these species. The B.C. Ministry of Environment has responsibility for invasive species, but there are no programs in place currently to deal with this diversity of threats. It was noted in 2010 that invasive animal data were very sparse and poor, and that there was no specific body acting to deal with invasive animals or other species (other than plants), and this remains the case today.

