

menziesia

Newsletter for the NPSBC Native Plant Society of British Columbia
Spring 2004

Volume 9, Issue 2

Giant Hogweed, *Heracleum mantegazzianum*: A Nasty Invasive Plant Species in British Columbia

by Nick Page, Raincoast Applied Ecology (napage@interchange.ubc.ca)
and Ron Wall, Parksville Streamkeepers Society (rrwall@shaw.ca)



Nick Page and giant hogweed in Vancouver.

Giant hogweed or giant cow-parsnip, *Heracleum mantegazzianum* Sommier & Levier (Apiaceae), is a conspicuous and potentially troublesome exotic plant species which is in its initial stages of invasion in southwest British Columbia. Because management is most effective on small populations during population expansion, the purpose of this article is to raise awareness and improve management, particularly focusing on eradication, early in the invasion process in British Columbia. A detailed description of its current distribution in British Columbia is included.

cont'd p. 5



What's inside

Events	2
Spring Plant Sales	2
The Moss Triple Crown	4
Native Plants - Aided or Abraded?	9
<i>Fragaria</i> becomes <i>Potentilla</i>	11
The Lovely <i>Calypso</i>	12
Calendar Project	13
Plant Profile	14

NPSBC Board of Directors

Frank Skelton, President

feskelton@telus.net
Twinflower Enterprises
3860 West 19th Ave., Vancouver BC, V6S 1C8
Tel: 604-228-8879
Committees: Development, Education, Research

Anna Colangeli, Vice-President

colangel@camosun.bc.ca
4093 San Capri Terrace
Victoria BC, V8N 2J5
250-477-4210
Committees: Education, Research

David Blundon, Treasurer

dblundon@shaw.ca
2898 Ilene Terrace, Victoria BC, V8R 4P1
Tel: 250-598-1501 (H). Fax: 250-370-3437
Committees: Development, Research

Angela Deering, Secretary

angeladeering@shaw.ca
2544 Empire Street
Victoria BC, V8T 3M6
250-595-5820
Committees: Development, Education

Eva Antonijevic

evaantonijevic@shaw.ca
RR 2, 2177 Porter Rd, Roberts Creek BC, V0N 2W5
604-886-9835
Committee: Development.

Ray Coupé

ray.coupe@gems7.gov.bc.ca
Southern Interior Forest Region, Ministry of Forests
200-640 Borland St., Williams Lake BC, V2G 4T1
Tel: 250-398-4717
Committees: Research

Shona Ellis

shona@interchange.ubc.ca
208-1350 Comox St., Vancouver BC, V6E 4E1
Tel: 604-682-3069. Fax: 604-822-6089
Committees: Development (Chair), Education

Perry Grilz

Perry.Grilz@gems2.gov.bc.ca
Ministry of Forests
1011 4th Ave., Prince George, BC, V2L 3H9
Tel: 250-565-6148 (W), 250-962-5168 (H).
Fax: 250-565-4383.
Committees: Research, Education (Chair)

Rose Klinkenberg

carex@telus.net
Richmond BC
Committees: Research, Development

Vanessa Pasqualetto

vpasqualetto@yahoo.com
Vancouver, BC
Committees: Development, Education, Research

Patrick Williston

pwilliston@bulkley.net
Mnium Ecological Research
Box 4979, Smithers BC, V0J 2N0
Tel: 250-877-7702

Rossalynn Woodgate

rwoodgate@shaw.ca
Woodgate Native Plant Services
Box 508, Duncan BC, V9L 3X8
Tel: 250-748-2558
Committees: Development, Education, Research

Events

Victoria Native Plant Study Group

Fall

September 16, 2004 - Lost Streams of Victoria - Jennifer Southurst - Fisheries and Oceans Canada

October 21, 2004 - University of Victoria Ecosystem Care and Restoration Projects - Magnus Bein & others Restoration of Natural Systems graduates

November 18, 2004 - Somenos Garry Oak Restoration Project - An Overview - Dave Polster - Plant Ecologist

Spring

January 20, 2005 - The Gorge Restoration Project - Paula Hesje, Project Manager - The Land Conservancy

February 17, 2005 - TBA

March 17, 2005 - TBA

April 21, 2005 - Rithet's Bog Restoration Project - Sharon Hartwell - Project Manager

NPSBC

2004

Annual General Meeting

The date for this year's AGM has not been set yet but it will likely be in October and be held in the Lower Mainland somewhere.

Details will be given in the next issue of *Menziesia*.

Spring Plant Sales

by Ross Waddell

In spring, many NPSBC members' minds and wallets turn towards the purchase of native plants for their gardens. To meet this interest, the NPSBC has been involved in the development of three native plant sales held in the South Coast and Islands regions of the province. Though the supply of native plants at retail nurseries and garden centres has been growing somewhat over the years, most species are still not commonly available or sell out early in the season. These sales offer the best opportunity to see and purchase the many native species that are produced by the native plant nursery industry; to meet nursery owners, native plant experts and enthusiasts; and to get information on growing native species in the garden.

The Pacific Northwest Plant Sale has developed to become the largest event of its kind in the western US and Canada. The event was founded at the University of British Columbia Botanical Garden in 1998, and following a one-year hiatus, it returned for its fifth year this April. The sale brings together most of the specialty native plant nurseries from the South Coast and Islands regions of the province which sell direct to the public in a farmer's market setting. This year, there were eight nurseries selling over 250 species of plants native to the West Coast, from Alaska to northern California. The event was a great success with participating nurseries selling out much of their stock.

First conceived of and chaired by NPSBC member Rozalyn Harris, the event has been organized by the NPSBC and the UBC Friends of the Garden in cooperation with the Botanical Garden. Many NPSBC members have been involved in the coordination of the event over the years including Diane Douglas, Ross Waddell, Frank Skelton, Eva Antonijevic, Rozalyn Harris and Hugh Daubeney. This year, over 30 volunteers from the NPSBC joined together with volunteer members from the Friends of the Garden to run the sale. For the first time, a central cashier service was offered and while there were a few problems, including a disconnection in the power cord for the credit card line, it is hoped the centralized service will make payment easier and more efficient for the customer.

The Pacific Northwest Plant sale has a number of objectives, among them making native plants available to the public; educating the public about native plants and habitats in general; encouraging stewardship of the natural and urban environments; and supporting development of British Columbia's native plant nursery industry. The event is enhanced with exhibits by organizations working with native plants and habitats, and tours of the BC Native Garden led by NPSBC and FOG members as well as UBC Botanical Garden staff. Tour leaders from the NPSBC have included Terry Taylor, Mildred Greggor, Douglas Justice, Allison McCutcheon and Brian Compton.

This year, the event focused on native edible species and plant sales were complemented with the sale of non-timber forest products (NTFPs) - food and related products made from sustainably harvested plants, and organic gardening products. The event was fortunate to have as its chair this year, Dr. Hugh Daubeney, a member of both the NPSBC and the

FOGs who is also a world-renowned breeder of berry crops. As part of our media promotions, Dr. Daubeney was able to provide expert information on the use of native species in the breeding of blueberries, raspberries, blackberries and strawberries. The sale was also honoured to have the participation of a number of groups involved with non-timber forest products. They include the new Centre for Non-Timber Resources (CNTR) at Royal Roads University, which supports and encourages sustainable utilization of non-timber forest resources; the Siska First Nation from Lytton BC which sells a range of products including jellies, teas and soaps made from native species; and the Wilp Sa Maa'y Harvesting Cooperative, a First Nations enterprise producing jams and jellies, which was formed by the Gitanyow, Gitxsan & Wet'suwet'en in Northern BC.

The Pacific Northwest Plant Sale is a fund-raising mechanism for the NPSBC and the Botanical Garden and participating nurseries generously donate 25% of their gross profits for development of the NPSBC and the BC Native Garden at the Botanical Garden; other vendors also contribute in the form of participation fees. The gross income from plant sales over the four hour event this year was a record \$30,000 and the donation to the NPSBC, combined with other event revenue, amounted to around \$2,300.

On the following weekend, VanDusen Botanical Garden in Vancouver was the setting for the twenty-sixth annual VanDusen Plant Sale. This is the largest plant sale in British Columbia and the native plant section is a major component of the event. Frank Skelton has chaired the section for the last nine years in partnership with Erin

Skelton and with additional assistance in recent years from a number of NPSBC members. The native section offers plants that have been grown or potted up by Frank and Erin and their volunteers, together with plants purchased from specialty native nurseries, or sold direct by them at the event. To demonstrate how native plants can be used in the garden, a popular display has been designed and installed each year by volunteer Marilyn Mount. This year, the native plant section saw record sales of \$9,000 over a five hour period.

On the same weekend as the VanDusen sale, the Swan Lake Christmas Hill Nature Sanctuary held its ninth annual Gardening for Wildlife Weekend in Victoria. This two-day event features a native plant sale, workshops on gardening with native plants and tours of the nature sanctuary and its native plant garden. The NPSBC is pleased to have been a sponsor of this event for the past six years, with funds directed to one of the educational workshops. More information on the event is available on the nature sanctuary's website at www.swanlake.bc.ca/plantsale.htm.

These three spring native plant events are an important service offered to NPSBC members and to the public at large. Thanks are due to all the nursery and other vendors, exhibitors, tour leaders and other volunteers who have contributed to the sales over the years. The NPSBC has planned a meeting of nursery owners from the South Coast and Islands regions of the province in August to discuss the future of these events. It is hoped that the NPSBC can continue to support the development of the native plant nursery industry in the province and promote the sourcing of plants for its members and the general public.

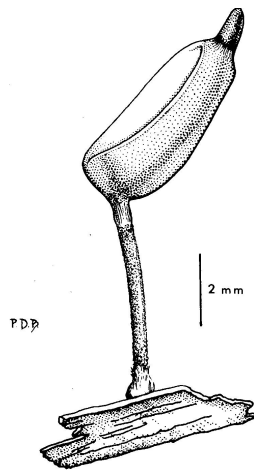
The Moss Triple Crown

By Patrick Williston, Gentian Botanical Research

People with an interest in BC's moss flora will be familiar with Wilf Schofield's wonderful book "Some Common Mosses of British Columbia." On page 33, Schofield draws attention to "Some Uncommon Mosses of British Columbia," or what I like to call the Moss Triple Crown. And while, in most cases, these are not the rarest mosses in the province, their startling peculiarities have instantaneous allure, and for me they've become a bit of an obsession. It did not take long to decide that I had to find them as a rite of passage, a signal that I had attained an understanding of at least the basics of bryology, the study of mosses, liverworts and hornworts. And so a quest was born, a quest for the Moss Triple Crown: bug moss (*Buxbaumia*), umbrella moss (*Splachnum*) and goblin's gold (appearing as "luminous moss" in Schofield's book, (*Schistostega pennata*)).

My first success came while working in the Interior Cedar-Hemlock forests in Wells Gray Park. I was documenting the vegetation of an old growth forest and was examining the liverworts inhabiting a large decayed log when I spied a slender bumpy stalk that apparently once held aloft a capsule, one that had since been consumed by a gluttonous beetle. My pulse quickened...could it be? And indeed it was; a few days later I encountered the entire unmolested plant perched on another log, capsule poised as if about to deliver a venomous strike, the revered bug moss, *Buxbaumia piperi*. Once I recognized its preferred substrate, well decayed wood (or as I like to call it, cube-rot) usually covered in a

fine patina of leafy liverworts, I began to find this once elusive species everywhere. In fact, virtually every hike I go on now features a race with my partner Paula Bartemucci to see who will spot one first. And inevitably they appear, a scattered few with their distant gazes fixed on the horizon and their noses (operculae) lifted, in what can only be construed as an uppity posture. Subsequent botanising has also lead to encounters with the soil dwelling *Buxbaumia aphylla* and the secretive *Buxbaumia viridis* (a protected species in Washington State) which make the full complement of this



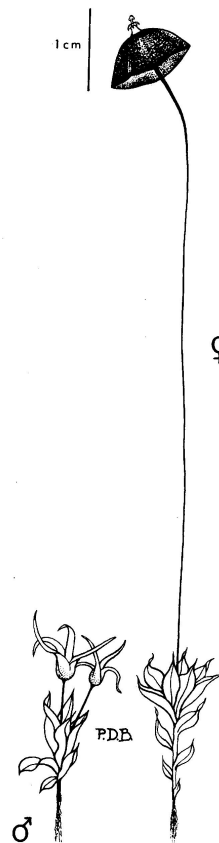
Buxbaumia piperi.

From Schofield (1992).

genus in BC. This family has one other representative in BC, *Diphyscium foliosum*, which Schofield found in Lynn Canyon and elsewhere on the west coast (Schofield et al. 2004). Rare in BC, this species is more common in eastern Canada.

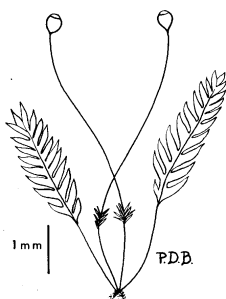
My first experience with the Splachnaceae was on a trip to Burns Bog with Shona Ellis and Wilf Schofield himself, two bona fide moss fanatics. The Splachnaceae are dung dwellers which rely on flies to transport their spores to new dung heaps. To this end, several species

have evolved parasol-shaped landing pads on their capsules upon which the flies alight, which aids spore dispersal. However, most species in this family do not have parasols, such as the reasonably common *Tetraplodon mnioides*, which is the moss we found in the bog on that day. It would be many years before I finally came upon a *Splachnum* with minute parasols; *Splachnum luteum*, clustered on a tidy pile of moose dung somewhere on the Nechako Plateau, its bright umbrellas looking much like tiny yellow *Mycena* mushrooms. What a beauty, and well worth the wait. *Splachnum rubrum* is the only other parasol-bearing species that occurs in BC and it is known from only a few localities from the central region of the province.



Splachnum rubrum.

From Schofield (1992).



From Schofield (1992).

Schistostega pennata.

There was only one of the trinity left to discover, and it was the most valuable of them all: goblin's gold, *Schistostega pennata*. I looked everywhere, never passing a root tip-up without a thorough inspection, but all was for naught; it simply wouldn't be found. Instead, I had to wait until it found me. It happened one summer evening while out on a hike with lichen guru Trevor Goward. We were climbing through a sub-alpine forest in Wells Gray Park with the low sun casting a warm yellow glow through trees festooned with hair lichens. A sparkle of light caught my eye. Low and behold, there before me was a root mound glistening with a veritable fortune of goblin's gold! I was enraptured. Tiny pieces of shiny gold! *Schistostega pennata* is one-of-a-kind, there is no others in the genus, at least not in BC.

My quest was thusly completed. But was it? Was that the end of my bryologising? Of course not. Not the least because I learned about another unusual beauty not mentioned in Schofield's moss book. This one appears in his liverwort book, "Field Guide to Liverwort Genera of Pacific North America" published in 2002. *Takakia*, also known as puzzle moss or nanja-monja-goke (Japanese for "impossible moss"), is a moss disguised as a liverwort, which is why it appears in Schofield's liverwort book. This genus is represented by two species in BC:

Takakia lepidozoides and *Takakia ceratophylla*. For many years it defied description, moss or liverwort, in part because sporophytes had never been found. That changed when a colleague of Schofield's discovered sporophytes on a specimen from the Aleutian Islands, which helped determine that it had greater similarities to mosses.

Populations are known from the BC's north coast and from Haida Gwaii. In fact, Takakia Lake on Moresby Island is named after the puzzling moss that graces its alpine shores. However, it is difficult to get there if you don't own a helicopter (and I don't); which is to say, I still have not found this hidden gem, and so my search continues. Will it end with *Takakia*? I suspect not. In fact, I suspect that Schofield surreptitiously emphasized the Moss Triple Crown specifically to lure unsuspecting botanists into the captivating world of bryology. And I think that it's working.

References Cited

- Schofield, W.B. 1992. Some Common Mosses of British Columbia. Royal British Columbia Museum, Victoria. 394 p.
- Schofield, W.B. 2001. Field Guide to Liverwort Genera of Pacific North America. Global Forest Society and University of Washington Press, Seattle. 228 p.
- Schofield, W.B., Talbot, S.S. and S.L. Talbot. 2004. Bryophytes from Simeonof Island in the Shumagin Islands, Southwestern Alaska. Journal of the Hattori Botanical Laboratory 95: 155-198.

Identification and Biological Characteristics

H. mantegazzianum is a member of the carrot family (Apiaceae) whose native range is the Caucasus Mountains in southwest Asia (Tiley et al., 1996). It is closely related to a widespread native species, *Heracleum maximum* Bartram (cow-parsnip; previously known as *Heracleum lanatum* Michaux), which is found in wet meadows, roadsides, and moist forests throughout British Columbia. *H. mantegazzianum* has been introduced to western Europe, Britain, Scandinavia, eastern North America, and the Pacific Northwest purposefully or by accidental human transport (Morton, 1975; Pysek, 1991; Tiley et al., 1996; Darbyshire and Morton, 2003; Booy, 2003). It is designated as a noxious weed in Washington, Oregon, Florida, and North Carolina (USDA, 2003). *H. mantegazzianum* is generally distinguished from *H. maximum* by its larger size; where flowering plants of *H. maximum* seldom reach over 2.0 m in height, *H. mantegazzianum* is often 2.5 to 4.0 m in height with lower leaves in a basal rosette between 1.5 to 2.0 m in total breadth. It is recognized by the Guinness Book of Records as the world's largest weed (listed at 3.65 m tall) (Guinness World Records, 2003). The stem can be >10 cm in diameter although 3-8 cm is more common. Another identifying characteristic is diffuse or patchy purplish-red pigmentation with raised bumps or nodules on the stem, whereas *H. maximum* may have some purplish spots but it is generally light green in colour with

diffuse hairs. The inflorescence of *H. mantegazzianum* forms a broad (30-50 cm) flat-topped umbel composed of many small white florets. Fruit production is heavy and one plant may produce between 750 and 50,000 mericarps, each consisting of two joined seeds (Tiley et al., 1996). The fruit of *H. mantegazzianum* tends to be larger than that of *H. maximum* (about 1-1.5 cm long compared to 0.8-1.2 cm) with different resin canal structure (Darbyshire and Morton, 2003). Dispersal is either by water movement along streams, ditches, and urban storm drainage systems, or by human activity. Some fruits or seed heads are picked for decorative uses, garden planting and culinary purposes (e.g., golpar spice); however, transport of soil and seed from infested areas is likely a more important means of dispersal.

Management Concerns

There are two primary reasons why *H. mantegazzianum* is considered an invasive species of management concern in British Columbia. First, it can exclude native plant species through direct competition for light or other physical resources in open habitats (e.g., forest edges, meadows, stream margins) (Tiley et al., 1996). Dense patches along forest edges that were subjectively evaluated in the City of North Vancouver had very low plant species richness, particularly of native species. *H. mantegazzianum* may also reduce streambank stability by reducing native shrub or forb cover during the winter flood period. It can also establish in shaded forest such as stream ravines, although its growth and flowering is reduced and it is not considered a strong competitor in these environments (Tiley et al., 1996). Second, *H. mantegazzianum* produces light-activated chemicals (furanocoumarins) in its leaves, roots, stems,

flowers, and seeds which can cause minor to severe contact dermatitis in combination with exposure to sunlight (Camm et al., 1976; Towers, 1980). Furanocoumarin-induced dermatitis typically consists of blisters that form within 48 hours and become pigmented (blackened or purplish) scars that can last as long as 6 years (Tiley et al., 1996). Longterm sensitivity to sunlight may follow. The highest concentrations of furanocoumarins are present in leaves and roots during the early part of the growing season (Knudsen, 1983). *H. maximum* and other members of the carrot family also contain furanocoumarins (Nielsen, 1971).

Distribution in British Columbia

Based on current distribution patterns, *H. mantegazzianum* appears to have been originally introduced at two localities in southwest BC: French Creek near Parksville on eastern Vancouver Island; and the City of North Vancouver on Vancouver's North Shore. *H. mantegazzianum* was first recorded in riparian areas along French Creek in 1964 (Dawe and White, 1979) and the largest populations on Vancouver Island are still found in the surrounding area. Dawe and White (1979) speculated that it had been introduced by 1944 although the exact site and source are uncertain. Beyond the French Creek area, Ron Wall and colleagues have documented an expanding list of occurrences on southeastern Vancouver Island including the Victoria area (garden on Helmcken Rd.; Weir's Beach, Metchosin), Saltair (garden on Chemainus Rd.), Gabriola Island (Drumbeg Park), Nanaimo (gardens near Quennel Lake and Cat Stream; ditch along College Drive; Island Highway near airport), Nanoose Bay (gardens on

Seahaven and Ashcroft roads; Island Highway near Nanoose Creek), Parksville (Heath Ave. near Englishman River estuary; Aquila Park), Errington (Island Highway near Englishman River; Leffler Rd.), Qualicum Beach (beach near Old Island Highway; Seacrest Place), Qualicum Bay (Dunsmuir Rd.; garden on Old Island Highway), and Denman Island (private garden). Also, there have been recent unconfirmed reports in a wholesale nursery near Cobble Hill, along the E&N Railway line in Nanaimo, on Shooting Star Place in Nanoose Bay, in a private woodlot near the Englishman River in Errington, in the Eaglecrest area of Qualicum Beach, along Whiskey Creek near Coombs and in Courtenay.

In the Lower Fraser Valley, the earliest record based on a confirmed specimen is in Mahon Park in the City of North Vancouver from 1974 (UBC Herbarium Acc. 156773). This is believed to be the epicenter of *H. mantegazzianum* invasion in the Lower Fraser Valley as the largest populations are currently located along Wagg Creek near Mahon Park (19th St. and Jones Ave.). Recent assessment and mapping for the City of North Vancouver's Engineering, Parks and Environment Department found smaller populations along roadsides and streams throughout the City of North Vancouver with larger populations on Mosquito Creek near Upper Levels Highway (and downstream); 3rd St. west of Lowlevel Road; and in the Tempe Heights area east of Lynn Valley. The assessment showed that *H. mantegazzianum* was recorded at more than 100 sites within the City of North Vancouver ranging from single plants along roadsides and streams to large patches greater than 1000 square meters. The total estimated population size in the City of North Vancouver was 7200 sq.m.

H. mantegazzianum is also prevalent in adjacent areas of the District of North Vancouver including the lower Seymour River and roadsides near the Ironworkers Memorial Bridge and upper Wagg Creek (St. Andrews St. and Queens Ave.) and the central portion of the Mosquito Creek watershed. It is less common east of the Seymour River but has recently been observed in Deep Cove (Parkside Creek), Dollarton Highway (Burrard Inlet Indian Reserve #3), and near Riverside Drive and Mt. Seymour Parkway. The District of West Vancouver Parks Department has been actively managing *H. mantegazzianum* in parks for several years. Their mapping indicates it is found primarily in riparian areas in the Brothers Creek watershed (Brothers and Hadden creeks and adjacent areas of the eastern British Properties), lower Capilano River, Vinson Creek, Marr Creek, and Westmount Creek. It has also been recorded in residential areas northwest of Lighthouse Park, in Horseshoe Bay (Wellington Ave. area), and along the roadside of Marine Drive and Sunset Avenue west of Oxley Street.

H. mantegazzianum is less common in other areas of the Lower Mainland. In the City of Vancouver, small populations have been observed in Vanier Park, Queen Elizabeth Park (33rd Ave. area), Stanley Park (Lions Gate Bridge area), UBC Campus (Biology courtyard), 6th Avenue (east of Alder St.), Strathcona Community Garden (orchard area), and beneath the Burrard Street Bridge. Frank Lomer has also recorded populations on the south side of Sea Island in Richmond (shore of the Fraser River and east from Oak Street bridge), along the lower Brunette River on the Burnaby / New Westminster border, in a ravine north of 100 Ave. in Surrey; north of the Roberts Bank causeway in Delta, and in south

Burnaby and Coquitlam. Since this article was originally published in BEN, a small patch was discovered at the 232nd Ave. and Fraser Hwy in Langley, the end of 28th Ave. in Langley, Crab Park in Vancouver, near the parking area for GM Place in Vancouver, and along the CPR line (adjacent to Shell Rd.) south of Westminster Hwy in Richmond.

Management

Control or eradication of *H. mantegazzianum* is labour intensive and requires long term management. Recommended control methods include cutting or mowing above ground parts, digging, and herbicide application (Tiley and Philp, 1994; Dodd et al., 1994; Tiley et al., 1996). Application (spraying, stem injection, wiping) of glyphosate (Roundup) in April and May before plants are 1 m tall followed by a second application later in the season is the most universally recommended control method (Tiley and Philp, 1994; R. Cranston, pers. comm.). Deep tilling or severing the taproot 5 to 15 cm below the surface of the ground may be successful for small populations. Observations indicate that crushing or twisting the stem or leaf rosette during the early part of the growing season may reduce flowering, but is not effective for eradication or long term control. Seed longevity is greater than 7 years (Tiley et al., 1996) and on-going monitoring is required, with possible repeated treatments, to prevent re-establishment. There are no applicable biological control methods although research is currently underway to identify potential fungal or insect pathogens (Ravn, 2003). Sheep grazing has been used to control dense patches of *H. mantegazzianum* successfully (Andersen, 1994) but is impractical in urban or riparian areas in British Columbia. Because *H. mantegazzianum* requires 2 to 4 growing

seasons before flowering, eradication focusing on small, young stands is most successful. This typically requires training of both parks maintenance staff and volunteer groups to recognize and safely remove nonflowering plants. Gloves, safety goggles, and protective clothing are needed for safe handling. Stems and leaves can be left on site or composted if there is no risk of human contact. Seed heads should be disposed of separately by burning or other methods that prevents dispersal of seeds to other areas.

Invasive plant species management is generally most effective when small, initial populations can be eradicated or controlled to prevent further population expansion. Indeed, invasion ecology theory recommends that control efforts focus on small populations on the margin of range expansion as the most effective method for slowing or preventing further invasion (Moody and Mack, 1988). This requires an "early-warning" system that educates observers and managers to recognize invasive species before they become widespread and abundant, and resources to rapidly eradicate or control the invading species. Too often, invasive species management focuses on activities directed at organisms that are already widespread and abundant. In the case of *H. mantegazzianum*, resource managers have an opportunity to learn from the invasion patterns in other jurisdictions and implement municipal or provincial management strategies focusing on eradication and control of dispersal in British Columbia. Despite the large number of localities described above, many of the populations consist of small numbers of plants that could be easily eradicated. Success of an eradication program in British Columbia will depend on four key aspects:

- 1) provincial-scale organization and support, including funding for education, monitoring, and control programs;
- 2) education focusing on increasing public and institutional knowledge of the problem;
- 3) technical advice and resources for community-based or municipal eradication programs;
- 4) formal regulation of the plant as a noxious weed. Unlike Washington State and many areas in central and western Europe, and despite its risks to human health, *H. mantegazzianum* is not currently recognized as a noxious weed in British Columbia.

Contact Information

To report new occurrences of *Heracleum mantegazzianum* in British Columbia, please provide specific locality data (street names, map or GPS coordinates, or a detailed site description) and the size of the population (number of plants or patch size in square meters) to Nick Page, napage@interchange.ubc.ca or Ron Wall, rrwall@shaw.ca.

Acknowledgments

A number of people kindly provided distribution records or other information for this article: Roy Cranston, Rob Walker, Wade Calder, Dave Polster, Garry Fletcher, Adriane Pollard, Hans Roemer, Michael Hunter, Adolf Ceska, Rose and Brian Klinkenberg, Frank Lomer, Matt Henderson, Hugh Griffith, Richard Boase, Rob Adams, Carol Cornish, Stephen Darbyshire, Neil Dawe, Sean Rathlef and Bob Reed.

References

- Andersen, U.V. 1994. Sheep grazing as a method of controlling *Heracleum mantegazzianum*. In: de Waal, L.C., L.E. Child, P.M. Wade and J.H. Brock (eds). Ecology and management of invasive riverside plants. Chichester, John Wiley & Sons Ltd. Pp: 77-91.
- Booy, O. 2003. *Heracleum mantegazzianum*. USA Fact Sheet. Report available at www.flec.kvl.dk/giant-alien. Accessed August 21, 2003.
- Camm, E.H., W.L. Buck and J.C. Mitchell. 1976. Phytodermatitis from *Heracleum mantegazzianum*. Contact Dermatitis 2: 68-72.
- Darbyshire, S. and J.K. Morton. 2003. *Heracleum mantegazzianum*: Canada Status Report. Report available at www.flec.kvl.dk/giant-alien. Accessed August 14, 2003.
- Dawe, N.K. and E.R. White. 1979. Giant Cow Parsnip (*Heracleum mantegazzianum*) on Vancouver Island, British Columbia. Canadian Field Naturalist 93: 81-83.
- Dodd, F.S., L.C. de Waal, P.M. Wade and G.E.D. Tiley. 1994. Control and management of *Heracleum mantegazzianum* (giant hogweed). In: L.C. de Waal, L.E. Child, P.M. Wade, P.M. and J.H. Brock (eds). Ecology and management of invasive riverside plants; Chichester, John Wiley & Sons Ltd. Pp: 111-126.
- Guinness World Records. 2003. Largest weed. Website (www.guinnessworldrecords.com) accessed August 10, 2003.
- Knudsen, E.A. 1983: Seasonal variations in the content of phototoxic compound in giant hogweed. Contact Dermatitis 9: 281-284.
- Moody, M.E. and R.N. Mack. 1988. Controlling the spread of plant invasions: The importance of nascent foci. Journal of Applied Ecology 25: 1009-1021.
- Morton, J.K. 1975. The giant cow parsnip, *Heracleum mantegazzianum* Umbelliferae, in Canada. Canadian Field Naturalist 89(2): 183-184.
- Nielsen, B.E. 1971. Coumarin patterns on the Umbelliferae. Botanical Journal of the Linnaean Society 64 (Suppl. 1): 325-336.
- Pyšek P. 1991. *Heracleum mantegazzianum* in the Czech Republic: the dynamics of spreading from the historical perspective. Folia Geobotanica and Phytotaxonomica 26: 439-454.
- R. Cranston, pers. comm. 2003. Provincial Weed Specialist, Ministry of Agriculture, Fisheries, and Food. Communication by e-mail and mail.
- Ravn, H.P. 2003. Biological control of giant hogweed. Poster presented at the International Symposium, Non-Agricultural use of pesticides - Environmental Issues and Alternatives, Copenhagen May 7th - 9th 2003.
- Tiley, G.E.D. and B. Philp. 1994. *Heracleum mantegazzianum* (giant hogweed) and its control in Scotland. In: L.C. de Waal, L.E. Child, P.M. Wade, P.M. and J.H. Brock (eds). Ecology and management of invasive riverside plants. Chichester, John Wiley & Sons Ltd. Pp: 101-109.
- Tiley, G.E.D., F.S. Dodd and P.M. Wade. 1996. Biological flora of the British Isles: *Heracleum mantegazzianum* Sommier and Levier. Journal of Ecology 84: 297-319.
- Towers, G.H.N. 1980. Photosensitizers from plants and their photodynamic action. Progress in Phytochemistry 6: 183-202.
- USDA [United States Department of Agriculture] Animal and Plant Health Inspection Service. 2003. Website (www.aphis.usda.gov/ppq/weeds/) accessed August 10, 2003.

Originally published in Botanical Electronic News #314, September 2003. Used with permission.

Native Plants - Aided or Abraded?

By Malcolm Martin

Degradation and loss of habitat by introduction and spread of invasive alien plant species is widely considered a major risk to biodiversity. Ranged against this threat are noxious weed regulations, barriers to importing seeds and living stock of potentially troublesome species, ministerial and local government control programs. Publicity and education directed at the public and agricultural interests all attempt to combat the problem to whatever extent they can. Considering all these efforts, it is unsettling therefore to see other governmental actions that result in the opposite effect.

It is not as though non-native plant introduction is anything new, probably dating to the earliest days of racial migration as aboriginal peoples spread after the last Ice Age, or earlier. In his time Charles Darwin was puzzled on making landfall in what is now Brazil at the start of his Beagle voyage to find vast stands of thistles and other species that he was familiar with at home, plants that had reached the new lands somehow and spread with abandon. Such introduction of weed seeds travelling in supplies of imported crop seed must have run concurrently with European settlement around the world from its earliest days. Even now with the practice of sieving harvested seed, it is often not possible to guarantee an uncontaminated supply. But at least one other source of introductions that has lessened – from the earth and rock brought by ocean-going vessels from their home country and dumped at North American ports when ships had to load or unload ballast to obtain the right trim for sea-worthiness.

With the spread of agriculture in the new lands another threat arose when agronomic grasses started to be used to provide better forage for pasturing livestock as well as for haying. What a farmer needs is grass that is resilient under grazing and mowing, hardy, vigorous, spreading and highly-competitive, and breeding programs have certainly answered this call. The trouble is grasses don't recognize boundaries. Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), orchard grass (*Dactylis glomerata*) and crested wheatgrass (*Agropyron cristata*) are four favourites that readily escape and can easily out-compete native grasses under a range of conditions. Such aggressive tendencies make these and other grasses and forbs suitable for erosion control when seeded onto bare and disturbed soils... and therein lies another problem. Fast forward to the summer of 2003. Faced with hillsides of burnt vegetation and the prospect of snow melt and spring rains sweeping unprotected soils down-slope on to vulnerable houses and roads below, municipal leaders made it clear they expected prompt protective measures. But what to seed on exposed ground when there is virtually no domestic supply of the native grasses burned by fire? The agreed solution was to use a mixture devised by Ministry of Forests for use for erosion control, weed suppression and forage in the Interior Douglas-fir and Montane Spruce zones from 700 m to 1400 m, composed of:

Italian ryegrass	<i>Lolium multiflorum</i>	20%	non-native annual
western wheatgrass	<i>Pascopyrum smithii</i>	20%	native perennial
creeping red fescue	<i>Festuca rubra</i>	10%	variety of perennial non-native in S. BC, Canada
bluegrass	<i>Poa compressa</i>	10%	native and non-native perennial
common timothy	<i>Phleum pratense</i>	10%	non-native perennial
orchard-grass	<i>Dactylis glomerata</i>	10%	non-native perennial
alfalfa, var. Rambler	<i>Medicago sativa</i>	10%	non-native perennial forb
white clover	<i>Trifolium repens</i>	10%	non-native perennial forb

Burned areas in Okanagan Mountain Park (the northern outpost of the nationally-rare South Okanagan arid region) have therefore been seeded with a mixture at best no more than 30% native, a decision which further emphasises that when human pragmatism and environmental necessity come into conflict, it is the environmental considerations that are expected to give way. So much for biodiversity protection and enhancement. From an ecological perspective, it is immaterial whether debasement originates from the actions of a conscienceless vandal or whether it is from the actions of a well-meaning public service agency beset by the need to act quickly - the result is the same.

The response of Parks BC was a little different for seeding around parking areas and trails at Okanagan Mountain where it had the decision and opted for a mix, possibly 60% native, made up of:

western wheatgrass	<i>Pascopyrum smithii</i>	30%	native perennial
Italian ryegrass	<i>Lolium multiflorum</i>	25%	non-native annual
slender wheatgrass	<i>Elymus trachycaulus</i>	20%	native perennial
Canada bluegrass	<i>Poa compressa</i>	10%	native and non-native
hard fescue	<i>Festuca trachyphylla</i>	10%	non-native perennial
white clover	<i>Trifolium repens</i>	5%	non-native perennial forb

However, both mixtures contain white clover which will do well in damp areas where Red-listed cup clover (*Trifolium cyathiferum*) and short-flowered monkey-flower (*Mimulus breviflorus*) grow in the park.

The predicament faced by government agencies in cases such as forest fire rehabilitation is not new, and neither is the solution. The winter 2000 edition of *Menziesia* carried an article by Manny Vaartnou (Volume 5, issue 1) with an excellent discussion of the dire need for sources of grass seed of species appropriate to the local conditions and how these could be developed. His work through M. Vaartnou and Associates shown success in selecting and growing stock that could eventually become incorporated into the operations of existing seed companies – provided there were political and commercial willingness.

Efforts during the Okanagan/Shuswap Land and Resource Management Plan (LRMP) process to incorporate as a plan objective measures to encourage a

seed industry for supplying dry grassland species was received with disinterest by Forestry staff and dismissed with disdain. The contrary argument that cost would be far too high and supplies inadequate for requirements is perfectly true, but surely only by actively taking steps to create an industry can there ever be any hope of building up a volume of supply and reducing cost. Policies of biodiversity protection and invasive plant combat notwithstanding, it is only too evident that, at present, priorities rest elsewhere and our protected areas will continue to receive what is easiest to provide rather than what they need. Only governmental espousal of, and insistence on, native seed use for land rehabilitation can replace inertia to change with more ethical practices. If NPSBC or any other environmental group seeks a quixotic cause on which to exercise its powers of advocacy, here is one that will test both mettle and patience.

Late Newsletter

Apologies to everyone for the delay with this issue of *Menziesia*. The Spring issue is in your hands at about the time the Summer issue would normally come out. As a result, we will have to produce two more issues before the end of the year, so we need some extra help finding articles.

Here are some of the things we need:

Feature articles

Book reviews

Coming events

Botanical illustrations

Suggestions of articles that can be reprinted from other sources

Information on invasive plants

Articles on changes to plant names; for example, why was the name of Labrador Tea changed from *Ledum groenlandicum* to *Rhododendron groenlandicum*?

Remember, this is your Newsletter - the more people contributing to it, the better it represents the interests of our society. Thank you to those who have supported this publication and enriched us all with your contributions.

Hugh Griffith, Editor



Rhododendron groenlandicum
(Labrador Tea)

Illustration: Erin Skelton

Fragaria becomes *Potentilla*

by Hugh Daubeney

At present there is a revisionist movement in plant taxonomy and from the perspective of most of us this can be confusing to say the least. For example, the genus *Lycopersicon*, which includes the tomato, is now placed into *Solanum*, the genus containing the potato. Morphological, genetic and, most importantly, DNA data are responsible for the revisions. The data usually lead to “lumping,” rather than to “splitting,” two terms commonly used, sometimes fallaciously, to describe the activities of plant taxonomists. Now *Fragaria*, the strawberry genus, has become part of the *Potentilla*, the genus that contains cinquefoils.

An eminent taxonomist, Dr. D.J. Mabberley, who is on the staff of both the Royal Botanic Gardens, in Sydney Australia and the National Herbarium Nederland, University of Leiden, The Netherlands, has published a review paper that explains the implications of some of the revisions. The cultivated strawberry, *Fragaria x ananassa* becomes *Potentilla x ananassa*. The progenitors of this strawberry, which is an inter-specific hybrid, become *Potentilla chiloensis* (Pacific Coast beach or sand strawberry) and *Potentilla virginiana* (meadow or scarlet strawberry).

‘Pink Panda’ is an ornamental strawberry, until now considered the result of an inter-generic cross of the marsh cinquefoil, *Potentilla palustris*, with the cultivated strawberry, *Fragaria x ananassa*. With the revision it is now an inter-specific cross and has been given the

scientific name *Potentilla x rosea* Mabb. Dr. Mabberley has become the authority for this. ‘Serenata’, which came from a cross of a strawberry selection with ‘Pink Panda’ is also *Potentilla x rosea*. However, ‘Rosalyne’, which came from the strawberry breeding programme in Quebec, and is two generations removed from ‘Pink Panda,’ is *Potentilla x ananassa*. The ‘Pink Panda’ derivatives are completely fertile and set fruit that is

long feathery beaks or awns.” Moreover, a 1917 publication “— Taxonomic Studies on the Genus *Fragariae* (Rosaceae, *Potentillae*)” says “— the genus *Fragaria* is a most flexible and unstable group of plants.”

Taking a somewhat cynical view of the matter, it seems that the DNA data tell us what we already know. Maybe *Fragaria* will become more “stable” now that it is *Potentilla*.



Potentilla chiloensis on Vancouver Island.

edible. Even ‘Pink Panda’, itself, sometimes produces edible fruit.

We think all of this is very new. However, the following appeared in the 1858 publication “Handbook of British Flora”: “*Potentilla* — the genus already extended — perhaps be still better be defined if the Strawberry (that is *Fragaria*) — were likewise included. It would comprise all Rosaceae with a double calyx, distinct 1-seeded carpel — and the styles not transformed into

A final comment directly from Dr. Mabberley’s review: “Although the name-changes, like all name-changes, may be regretted, it is unlikely that the industry which, unlike in its marketing of ornamentals, rarely uses the Latin names for strawberries in any case, will object strongly.”

Reference

Mabberley, D.J. 2002. *Potentilla* and *Fragaria* (Rosaceae) reunited. *Tolopea* 793-797.

Photo: Hugh Daubeney

The Lovely *Calypso*:

Entanglements with Fungi and Bumble Bee

by Rhoda Love



Photo: Frank Skelton

Calypso bulbosa.

Fairy slipper orchids (*Calypso bulbosa*) are among the jewels of our Northwest coniferous woodlands. Here the stunning pink orchid is often found in old moist Douglas fir forests; however, we must overcome any provincial view of this favorite wildflower, for it is not ours alone. In North America, *Calypso* is broadly distributed and thus associated with many conifer species, among them pines, spruces, and hemlocks. In California, fairy slipper is found in the redwood forests of Marin, Del Norte and Siskiyou Counties to south of the Golden Gate. The orchid is found in Washington and British Columbia of course, and in the coastal forests of southeast Alaska. Further afield in North America the species also grows in Arizona, Colorado, Minnesota, Michigan, New York and Maine. Furthermore, and this may surprise you, the same species is well known in the forests of northern Europe and Asia.

The genus *Calypso*, which has but the single species, was named by Linnaeus who may have originally collected the plant on his journeys in Lapland. He named it for Kalypso of Greek mythology who was the goddess daughter of Atlas and Homer's beautiful nymph of the woods. The goddess Kalypso was encountered by Ulysses when wayfarer was shipwrecked on the Island of Ogygia. The word "Calypso" means "concealment," and in this case refers to the flower's place of growth in dense, shady forests.

With respect to *Calypso*'s entanglement with fungi, permit me to digress for a moment to cover a bit of forest ecology and define mycorrhizal relationships. All Northwest tree species so far investigated have been shown to require mycorrhizal fungi for health and optimal growth. In the mycorrhizal relationship, underground fungal filaments wrap

tightly around a tree's roots, channeling water and nutrients to the tree. Most local mycorrhizal fungi are Basidiomycetes (the so-called club fungi), and many are well-known mushroom species such as chanterelles, matsutake, and the poisonous amanitas. As mushroom hunters well know, the fruiting bodies of these species can be found in the root zones of the trees with which they have a mycorrhizal association. Mycorrhizal relationships are incredibly ancient — as much as 400 million years old! The fossil record strongly suggests that the first rootless plants to emerge from water and colonize dry land brought fungi with them and that these aided in obtaining water and minerals in the harsh new environment. Perhaps it is not too great a leap to conclude that mycorrhizal fungi may have enabled plants to colonize the land.

Now, to return to *Calypso*, our hidden jewel of the forest. Mycorrhizal relationships can be even more complicated, involving two species of higher plant rather than just one. It can be difficult for a small plant, such as an orchid, growing in the shade to intercept enough sunlight for photosynthesis. Consequently, several groups of small forest herbs have evolved an intricate strategy for obtaining food—they receive nutrients from trees via mycorrhizal fungi. This type of association occurs in most orchids and in certain members of the heath family such as Indian pipe. Whereas many of these plants have lost their chlorophyll and cannot make their own food, *Calypso bulbosa* has a single green leaf and can carry on photosynthesis; however, the plant is

mycorrhizal as well, and is never found far from the root zone of a conifer.

Finally, how is our demure, hidden Calypso entangled with bumblebees? Here I will quote one of the world's experts on pollination, a man who was one of my favorite and most eccentric professors when I was a student at the University of Washington fifty years ago. Dr. B. J. D. Meeuse, a Dutchman and a famous botanist, tells the following story of fairyslipper pollination:

"These lovely, innocent-looking orchids exploit "greenhorn" (i.e., newly hatched) bumblebees. The flowers have nothing of real value to offer; they contain no nectar. However, they look (and smell) like flowers that do have some goodies to hand out. The young bumblebees are fooled, and will visit the Calypso flowers, but after a few times they quit - in disgust one would be tempted to say (if it were not so unscientific). They are replaced by other greenhorn bumblebees who on subsequent days continue to appear

on the scene and have as yet had no unpleasant experiences."

So, in conclusion, our beautiful woodland Calypso has hitched itself to a fungus in order to obtain food from a tree, and also exploits unwary bees in order to set seed. Since many of the Greek gods and goddesses were opportunistic in many ways, perhaps the fairy slipper is aptly named for the goddess Kalypso.

Originally published in the Bulletin of the Native Plant Society of Oregon, 2004.

A reminder to the photographically inclined

The NPSBC is still soliciting images for our 2005 Native Plant Calendar. As the season marches on, keep your camera handy and your eyes peeled for images that may grace our walls next year. We want to finish the calendar by the middle of October to allow more time this year for Christmas gift orders. To meet that deadline, images must be collected as soon as possible. Here are some guidelines for submissions.

Clarity. The focus should be good. Enlarging and printing magnify every flaw.

Composition. Use the same criteria as for any two dimensional visual work of art.

Resolution. For digital photos use the highest possible for your camera. Images may be e-mailed in lower resolution with a note indicating that high resolution versions are available.

Species. Make sure that they are natives. Photos may be of plant parts, whole plants, groups of one or more species or habitat shots. Give your scientific curiosity and artistic creativity free rein.



Drosera rotundifolia in Lulu Island Bog, Richmond BC.

Photo: Melissa Cook.

The big question to consider when making a submission is - Would people want to look at this picture for a whole month?

As with the 2004 calendar we would like to include pictures of our members taking photos of plants. Plant photographers are often required to put their bodies through some pretty strange contortions to get that perfect shot. How about sending in a picture of a spouse or

friend in one of those compromising positions? (Please avoid jeopardizing marriages or friendships.)

Send submissions to dvsilton@shaw.ca. For further information please phone Virginia in Vancouver at 604-536-3529.

Photographers whose pictures are used will receive a free copy of the 2005 calendar. We're looking forward to hearing from all of you.

Plant Profile: *Holodiscus discolor*

By Richard Hebda

More and more these days gardeners and landscapers are turning to plants that require little maintenance and resist drought. Many native species of the drier regions of southern British Columbia fit these characteristics well. Among the shrubs, oceanspray is an excellent choice for the dry back corners of the yard.

Oceanspray of the Rose Family (Rosaceae) grows as a tall many-stemmed shrub from 1.5 to 5m high. Clumps reach from 2 to nearly 10 m across, often interwoven with their neighbours. Several stems rise upward from the centre of the clump, but then arch gracefully outward until, in exceptional cases, their tips touch the ground. Where large branches begin to bend, vigorous young shoots arise. These eventually arch over, replacing the parent which dies out. The bark of young shoots is brown and sometimes slightly angled. Old bark is light grey and nearly smooth.

Light green oval leaves 4-10cm long, scatter along the upper half of the branches. The lower surface of the leaves is much lighter coloured than the upper surface, giving rise to the species name, *I*, meaning “two-coloured.” Small to large teeth line the margin of the leaf. Numerous hairs give the leaves a soft texture. By late summer the leaves turn yellow or reddish and drop off leaving the shrub nearly naked.

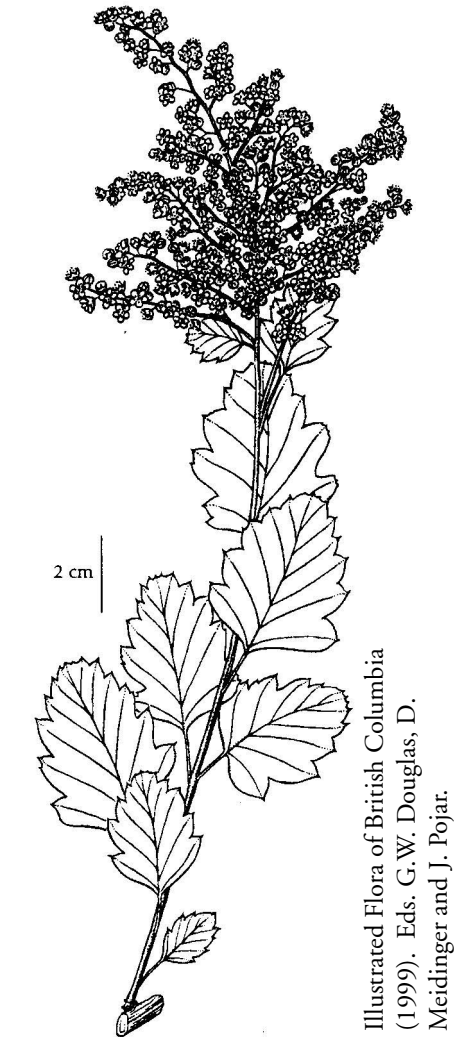
Great plumes of creamy white flowers cascade from the tips of the branches in June, lasting two to three weeks. Each 10-24cm long cluster contains hundreds of tiny whitish blooms. Examine a flower closely and you should find five

little petals attached to a tiny disc. Inside the petal ring are about 20 creamy stamens and five pistils. Great quantities of pollen attract hordes of pollinating insects. To my nose the blossoms release an exotic creamy scent, almost overpowering within a dense thicket. Once flowers fade, the clusters turn dry brown.

Oceanspray favours sunny to slightly shaded haunts. In BC it thrives on shallow rocky soils with very sharp drainage. Typically you will find it on rocky bluffs, forming thickets, at the edges of woods, and within open forests. The British Columbia distribution includes low to mid elevations along the coast from Bella Coola southward and about the southern quarter of the Interior. Oceanspray occurs abundantly on southeast Vancouver Island and the Gulf Islands. The North American distribution stretches southward to southern California and eastward to Montana.

Oceanspray can form the backbone of native plant thickets in your garden. The plant is easily grown from seeds. Collect the dry flower heads in fall and shake out the brownish seeds onto sandy soil rich in humus, cover thinly, then set out and leave for the winter. In spring, seedlings will appear and should be allowed to grow until fall. Then tease them apart carefully and plant out in large pots for raising on, or place out where you want them in your garden. Often there are numerous seedlings beneath established clumps. Apparently you can also propagate oceanspray by layering.

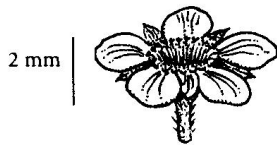
The shrubs can be left to grow as they will, but you may prefer to



Illustrated Flora of British Columbia (1999). Eds. G.W. Douglas, D. Meidinger and J. Pojar.

Holodiscus discolor

prune them, especially in a small garden where the overhanging branches reach out well over the yard. Well after the arching branches finish blooming (August or so) prune them back to a vigorous vertically growing branch, or a healthy branching point. The erect branch will elongate rapidly and flower the next year, gradually arching over to replace the old branch. By pruning every second year, you keep the centre of the clump growing vigorously and prevent the accumulation of dead wood. Incidentally bushtits love to build their pouch nests in large oceanspray bushes.



2 mm



2 mm

Illustrated Flora of British Columbia
(1999). Eds. G.W. Douglas, D.
Meidinger and J. Pojar.

Holodiscus individual flower and seed.

Known as ironwood to most of the southern Native peoples of British Columbia, oceanspray wood had many uses. Branches and stems were hardened over a fire and shaped into digging sticks, spear shafts, arrows and bows. Other uses included teepee pins, fish clubs, baby cradle hoops, armour, salmon barbecuing sticks, knitting needles and many more. Saanich peoples steeped the dry flower heads in hot water to make medicine against diarrhoea.

Holodiscus gets its scientific name from the Greek words “holo” = whole and “discos” = disk in reference to the unlobed disc to which the petals are attached. If you are looking for an easy-care, drought-resistant large native shrub, try oceanspray.

Reprinted with permission from Coastal Grower. Richard Hebda is Curator of Botany and Earth History, Royal British Columbia Museum, Victoria.

What's on the Web

Native Plant Society of British Columbia

<http://npsbc.org>

E-Flora BC

<http://www.eflora.bc.ca/>

Botanical Electronic News archives

<http://www.ou.edu/cas/botany-micro/ben/>

BC Conservation Data Centre

<http://srmwww.gov.bc.ca/cdc/>

Friends of Ecological Reserves

<http://www.ecoreserve.bc.ca/>

North American Native Plant Association

<http://www.nanps.org/index.shtml>

Desert Centre Osoyoos

<http://www.desert.org>

Canadian Botanical Assoc. - Ecology Section

<http://www.sru.edu/depts/artsci/bio/ecolsect.htm>

Evergreen - Bringing Nature to Cities

<http://www.evergreen.ca/>

Fraser Basin Council- Final Draft Report on Invasive Plant Strategy for British Columbia

http://www.fraserbasin.bc.ca/publications/documents/invasive_plant_strategy04.pdf

Nearby Nature (Naturescaping)

<http://www.plantnative.org/>

USDA Forest Service Fire Information System

<http://www.fs.fed.us/database/feis/>

Go for Green - The Active Living and Environment Program

- their take on native plant gardening
<http://www.goforgreen.ca/gardening/Factsheets/Fact6.htm>

Invasive plants of natural habitats in Canada: an integrated review of wetland and upland species and legislation governing their control

http://www.cws-scf.ec.gc.ca/publications/inv/index_e.cfm

The Society for Pacific Coast Native Iris

<http://www.pacificcoastiris.org/framesoc.html>

New members

since January 15th, 2004:

David & Steven Nield, Wild West Nursery,
Okanagan Falls

Erin Renwick & Family, Vancouver

Roy Forster, Vancouver

Wayne Weber, Delta

Don Campanella, Oregon State U., Corvallis, Oregon

Louise Mercer, Heriot Bay

Michael Legge, Nanaimo

Frances deMontreuil, White Rock

Meredith Areskoug, Vancouver

Marnie Dangerfield, Vancouver

John Worrall, Vancouver

Anna Waring, Sooke

Ann & Frank Buffam, Vancouver

Ron Long, Port Moody

Corinne Perry, Nanaimo

Greg Bartle, North Vancouver

Joan Hendriks, Lions Bay

Barbara Sherman, Coquitlam

Noel Spriggs, West Vancouver

Bernard Tague, North Vancouver

Lorraine Weir, Richmond

Gail Wilkinson, Vancouver

Collin & Wendy Varner, Vancouver

Jason Meuleman, Aqam Native Plant Nursery,
Cranbrook

Janet & Sheldon Gagne, Brentwood Bay

Jo Brown, Winlaw

Matthew Fairbarns, Victoria

NPSBC e-mail discussion list

Founding NPSBC board member Adolf Ceska has set up an e-mail discussion list as a convenient forum for members of the Society to discuss topics related to the native plants and botany of British Columbia. The list is unmoderated, but the hope is that discussion topics will be limited to botanical research, plant ecology, ethnobotany, native plant propagation, gardening with native plants, and events sponsored by the Native Plant Society of BC or similar organizations.

TO SUBSCRIBE to the list: Send a mail message containing 'subscribe NPSBC-L' (no apostrophes) to:

Majordomo@victoria.tc.ca

TO SEND MAIL to the list, address your message to:

NPSBC-L@victoria.tc.ca

If you have any questions regarding the discussion list, please send them to the list administrator at NPSBC-L-owner@victoria.tc.ca

Mission Statement

The purpose of the NPSBC Native Plant Society of British Columbia is to encourage knowledge, appreciation, responsible use and conservation of British Columbia's native plants and habitats.

Menziesia is published 4 times a year by the NPSBC. Upcoming submission deadline: September 20 (Summer). Subscription is included in membership to the NPSBC. Annual membership fees are: \$20 - Individual; \$30 - Household; and \$75 - Sustaining member.

Please note that advertising space is available in *Menziesia*. A 3.5" x 2" space costs \$20 for one insertion. Send a cheque or money order (made out to NPSBC), plus ad text or business card to editor Hugh Griffith (see below) by publishing deadline.

Newsletter submissions should be sent to:

Menziesia Attn: Hugh Griffith, Editor
9360 Dayton Ave, Richmond, BC, V6Y 1E3
E-mail: skink517@shaw.ca

NPSBC memberships should be sent to:

Erin Skelton, Membership coordinator
3860 West 19th avenue, Vancouver BC, V6S 1C8
Telephone: 604-228-8879 E-mail: feskelton@telus.net

NPSBC correspondence should be sent to:

NPSBC Attn: Ross Waddell
2012 William Street, Vancouver, BC, V5L 2X6
Tel: 604-255-5719 E-mail: information@npsbc.org

Menziesia Layout: Christine Munro

Garden Naturally with Native Plants



1770 Corrigan Road
Denman Island, BC

Catalogue available

250 335.1379
wildside@island.net