

## “GLISTENING PATCHES OF GOLD”:

### *The Environmental History of Scotch Broom (Cytisus scoparius) on Southern Vancouver Island, 1848–1950*

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IN E.J. HUGHES’S 1951 PAINTING, *Trees, Sooke Harbour, BC*, the dark stems of the iconic Douglas fir tower over orange-barked arbutus, both of which gaze upon Sooke Harbour. Conspicuous in the foreground is another familiar plant with distinctive upright branches and prolific yellow blooms: Scotch broom (*Cytisus scoparius*).<sup>1</sup> However, prior to the mid-nineteenth century, this well-known invasive weed was not growing on the rocky bluffs of Sooke, let alone on coastal British Columbia. The inclusion of broom in Hughes’s painting hints at one important characteristic of this plant: its perceived beauty and utility.

“Weeds,” writes Alfred Crosby, “are rarely history makers but they too influence our lives.”<sup>2</sup> Weeds may not be history makers but they have played an important role in European colonization of the New World. Crosby argues that Old World biota such as plants, domesticated animals, pathogens, and varmints (pest animals) enabled Europeans to conquer and colonize indigenous populations, creating a so-called Europeanized landscape.<sup>3</sup> Weeds also had an impact on Canadian agriculture. In *The War on Weeds in the Prairie West: An Environmental*

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<sup>1</sup> Ian M. Thom, *E.J. Hughes* (Vancouver: Douglas and McIntyre, 2002), 2. Taxonomic synonyms include: *Genista scoparia*, *Sarothamnus scoparius*, *Sarothamnus vulgaris*, and *Spartium scoparium*. Common names include: yellow broom, common broom, broomtops, European broom, Irish broom, and broom. See *USDA Germplasm Resources Information Network*, available at <http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl> (viewed 7 May 2008).

<sup>2</sup> Alfred W. Crosby, “Ecological Imperialism: The Oversea Migration of Western Europeans as Biological Phenomenon,” in *Canadian Environmental History*, ed. David Freeland Duke (Toronto: Canadian Scholars’ Press, 2006), 150. This article was originally published in Alfred W. Crosby, “Ecological Imperialism: The Oversea Migration of Western Europeans as Biological Phenomenon,” in *The Ends of the Earth: Perspectives on Modern Environmental History* (Cambridge: Cambridge University Press, 1998), 103–17. See also Alfred W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900–1900* (New York: Cambridge University Press, 1986).

<sup>3</sup> Crosby, *Ecological Imperialism*, 144, 152.



Figure 1. Broom growing on a 1920's gravel quarry on the Brooksdale Farm, South Surrey, BC. Photograph by the author.

*History*, Clinton L. Evans outlines the losing battle that prairie farmers fought with weeds, which resulted in changes in agricultural policy and weed management.<sup>4</sup> Evans argues that weeds are important economically, environmentally, and culturally.<sup>5</sup> The economic and environmental significance of weeds is well known, the cultural significance less so. Weeds are, in fact, intimately connected with culture. They are dependent on humans not only for their habitat but also for their physical and symbolic existence.<sup>6</sup>

Scholars have already examined the impacts of Old World biota on the societies and landscapes of Mexico, Australia, New England, New Zealand, and northern Canada.<sup>7</sup> This case study discusses the introduction and naturalization of Scotch broom in the landscape of southern

<sup>4</sup> Clinton L. Evans, *The War on Weeds in the Prairie West: An Environmental History* (Calgary: University of Alberta Press, 2002), 198.

<sup>5</sup> *Ibid.*, 12-15.

<sup>6</sup> *Ibid.*, 15.

<sup>7</sup> See Elinor G.K. Melville, *A Plague of Sheep: Environmental Consequences of the Conquest of Mexico* (Cambridge: University of Cambridge Press, 1994); William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 1983); Liza Piper and John Sandlos, "A Broken Frontier: Ecological Imperialism in the Canadian North," *Environmental History* 12 (2007): 759-95; Graeme Wynn, "Remapping Tutira: Contours



Figure 2. Broom growing alongside Rithet's Bog, Victoria, BC. Photograph by Shirley Lee.



Figure 3. Broom growing on Dallas Road, Victoria, BC. Photograph by Shirley Lee.

Vancouver Island, highlighting the roles that culture and biophysical factors play in the establishment of invasive weeds. Furthermore, Scotch broom's environmental history can help to explain the history of any number of weeds introduced to British Columbia.

After its initial introduction(s), broom quickly naturalized in the temperate, coastal regions of the province, and this resulted in rapid, localized ecological change that contributed to an increasingly Europeanized landscape. The unique biology and reproductive strategies of

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in the Environmental History of New Zealand," *Journal of Historical Geography* 23, 4 (1997): 418-46.

Scotch broom are often credited for its rapid spread.<sup>8</sup> However, weeds spread in conjunction with both human and non-human factors.<sup>9</sup> Biological factors alone do not explain broom's rapid naturalization. Cultural factors – including its perceived beauty, utility, and ornamental use – contributed significantly to its spread. Scotch broom is not, of course, the only European plant that has been introduced to British Columbia. Many others, including Canada thistle (*Cirsium arvense*), purple loosestrife (*Lythrum salicaria*), and tansy ragwort (*Senecio jacobaea*) are also Old World imports considered to be invasive weeds.<sup>10</sup> Like these, Scotch broom poses a significant threat to some ecosystems in coastal British Columbia.<sup>11</sup> Consequently, some scientists have described Scotch broom as “one of the five most destructive alien plants in Canada.”<sup>12</sup> Scotch broom's invasive growth and rapid colonization of disturbed sites creates dense monospecific stands with reduced biodiversity.<sup>13</sup> In British Columbia, it threatens the Red Listed<sup>14</sup> Garry oak (*Quercus garryana*) woodland ecosystem, the arbutus (*Arbutus menziesii*) ecosystem,<sup>15</sup> and commercial forest sites regenerated with Douglas fir (*Pseudotsuga menziesii*).<sup>16</sup> Ironically, Scotch broom is not listed in any federal or provincial weed acts.<sup>17</sup> However, the *Field Guide to Noxious and Other Selected Invasive Plants of British Columbia* describes it as a “non-native invasive.”<sup>18</sup> At present Scotch broom has spread along coastal

<sup>8</sup> David J. Peterson and Raj Prasad, “The Biology of Canadian Weeds. 109. *Cytisus scoparius* (L.) Link.,” *Canadian Journal of Plant Science* 78 (1998): 497. Peterson and Prasad acknowledge that human activities have accelerated the spread of broom. However, the emphasis of their research is on its biology and ecology.

<sup>9</sup> Piper and Sandlos, “Broken Frontier,” 776.

<sup>10</sup> Lewis J. Clark, *Wild Flowers of the Pacific Northwest from Alaska to Northern California* (Sidney, BC: Gray's Publishing, 1976), 540, 575. Canada thistle and tansy ragwort are also classified as “noxious” under the British Columbia Weed Control Act. See David Ralph, B. Wikeem, and R. Cranston, *Field Guide to Noxious and Other Selected Invasive Plants of British Columbia*, 6th ed. (Victoria: Teldonprintmedia, 2007), 1, 80.

<sup>11</sup> Bruce A. Caldwell, “Effects of Invasive Scotch Broom on Soil Properties in a Pacific Coastal Prairie Soil,” *Applied Soil Ecology* 32 (2006): 149.

<sup>12</sup> Linda Gilkeson, L. Bonner, R. Brown, K. Francis, D. Johannsen, R. Canessa, J. Alder, D. Bernard, R. Paynter, G. Mattu, and C. Wong, *Alive and Inseparable: British Columbia's Coastal Environment 2006* (Victoria: BC Ministry of Environment, 2006), 226.

<sup>13</sup> Peterson and Prasad, “Biology of Canadian Weeds,” 499.

<sup>14</sup> A plant community that is “extirpated, endangered or threatened.” See the British Columbia Conservation Data Centre 2008, *BC Ecosystems Explorer*, available at <http://www.env.gov.bc.ca/atrisk/glossary.html#r> (viewed 14 May 2008).

<sup>15</sup> Raj Prasad, “Current Status and Management Options of Exotic and Invasive Weeds of Forestry in Coastal British Columbia, Canada,” *Outlooks on Pest Management* 16, no. 5 (October 2005): 1.

<sup>16</sup> Peterson and Prasad, “Biology of Canadian Weeds,” 498.

<sup>17</sup> *Ibid.*, 499.

<sup>18</sup> Ralph et al. *Field Guide*, 82.

British Columbia to Haida Gwaii and the Gulf Islands, and it occurs in isolated pockets in the Okanagan and Kootenays.<sup>19</sup> The plant has also naturalized in coastal Alaska,<sup>20</sup> Washington, Oregon, and California, and from Nova Scotia to Georgia.<sup>21</sup>

Efforts to identify the person who originally introduced Scotch broom to British Columbia may have been rooted in a kind of romanticism linked to the fact that the plant became a familiar and beloved ornamental. Generally, those who have sought to identify the human vector have pointed to two particularly well-known figures in British Columbia's history, a founding fur trader and a pioneering agricultural settler. As early as the 1890s, the *Victoria Colonist* credited Chief Factor James Douglas of the Hudson's Bay Company (HBC) for introducing this species.<sup>22</sup> Thirty-five years later, the *Colonist* suggested that, in fact, Captain Walter Colquhoun Grant had introduced Scotch broom to Sooke, British Columbia, in 1851.<sup>23</sup>

These men are of historical interest for the light they can shed on how and why Scotch broom arrived in British Columbia, but debate about who was first to bring broom to the province is of little more than antiquarian interest. This article demonstrates that Scotch broom was introduced to southern Vancouver Island multiple times, both intentionally and unintentionally, in the nineteenth and twentieth centuries. If Grant or Douglas had not introduced broom it would almost certainly have become established anyway. Once introduced, European and Aboriginal cultural factors, its unique biology, and the biogeoclimatic features of southern Vancouver Island contributed to its rapid naturalization.

Walter Colquhoun Grant was born on 27 May 1822 in Edinburgh, Scotland.<sup>24</sup> Descended from an old honourable family, the Grants of Mullochaird lived near Duthil, on the River Spey.<sup>25</sup> Grant was raised

<sup>19</sup> Peterson and Prasad, "Biology of Canadian Weeds," 499.

<sup>20</sup> "Non-Native Plant Species of Alaska," available at <http://www.akweeds.uua.alaska.edu/akweeds> (viewed 22 May 2008).

<sup>21</sup> Peterson and Prasad, "Biology of Canadian Weeds," 499.

<sup>22</sup> John Murray, "Days of Forty Nine," *Daily Colonist* (Victoria), 20 February 1896, 6. See also J.G., "Victoria the Beautiful," *Daily Colonist* (Victoria), 22 September 1907, 17.

<sup>23</sup> "Historic Grant Farm Scene of Celebration," *Daily Colonist* (Victoria), 12 July 1931. See also A.A. Warren, "What Prompted Captain Grant to Bring Broom?" *Daily Colonist* (Victoria), 8 July 1956. Several historians have similarly argued that Grant introduced Scotch broom. See Willard E. Ireland, "Captain Walter Colquhoun Grant: Vancouver Island's First Independent Settler," *British Columbia Historical Quarterly* 17, 1 and 2 (1953): 114ff.; James E. Hendrickson, "Two Letters from Walter Colquhoun Grant," *BC Studies* 26 (1975): 6; and the *Dictionary of Canadian Biography Online*, s.v. "Walter Colquhoun Grant," by Barry Gough.

<sup>24</sup> Ireland, "Captain Walter Colquhoun Grant," 90.

<sup>25</sup> *Ibid.*, 88.

by his cousin, William Brodie of Brodie at Brodie Castle.<sup>26</sup> In 1849, he immigrated to Vancouver Island, where he purchased approximately forty hectares of land from the HBC.<sup>27</sup> He was also commissioned by the HBC to “make out a distinct plan of his own lot, and of the lands which were in occupation of the Fur Trade.”<sup>28</sup> Upon arriving on Vancouver Island, Grant purchased land on Sooke Harbour and built a log cabin, barn, several outbuildings, and a sawmill on a nearby creek.<sup>29</sup> He then sailed to the Sandwich Islands in October, after quitting his surveying job and laying off some of his farm labourers.<sup>30</sup> Grant returned to his farm in February 1851 but left a few months later for Oregon’s Klamath goldfields. He returned once again in the fall of 1853, sold his farm to John Muir, Sr., and left Vancouver Island for good.<sup>31</sup>

More than three quarters of a century later, the *Daily Colonist* carried the following account of Grant’s introduction of Scotch broom:

During his visit to the Sandwich Islands in October 1850, the British Consul gave him some broom seeds which, on his return, he planted in front of his home. Later when the Muirs bought the place it was found that just three of the seeds had sprouted. The men of the family wanted to uproot the tiny bushes, but Mrs. Muir [Anne] protested wishing to retain the broom for sentiments sake to remind her of Scotland. The men stayed their hands.<sup>32</sup>

While the source of this information is unknown, James Hendrickson suggests it came from Douglas R.W. Muir, the son of John Muir, Sr., who purchased Grant’s farm in 1853.<sup>33</sup> This was not, however, the *Daily Colonist*’s first article about the introduction of Scotch broom. In 1896, John Murray argued that, in fact, James Douglas introduced broom to Fort Victoria in 1848 after obtaining the seeds in Oregon City.<sup>34</sup> Murray also claimed that, upon arriving at Fort Victoria in 1849, he observed near the base of Beacon Hill, “here and there growing luxuriantly, a bunch

<sup>26</sup> Hendrickson, “Two Letters,” 4.

<sup>27</sup> Ireland, “Captain Walter Colquhoun Grant,” 96.

<sup>28</sup> Barclay to Douglas, 8 February 1850. See Hartwell Bowsfield ed., *The Hudson’s Bay Company Record Society: Fort Victoria Letters, 1846–1851* (Winnipeg: Hudson’s Bay Record Society, 1979), 40ff.

<sup>29</sup> Walter Colquhoun Grant, “Description of Vancouver Island,” *Journal of the Royal Geographical Society of London* 27 (1857): 283.

<sup>30</sup> Ireland, “Captain Walter Colquhoun Grant,” 113.

<sup>31</sup> *Ibid.*, 114, 117.

<sup>32</sup> “Historic Grant Farm,” 10.

<sup>33</sup> Hendrickson, “Two Letters,” 6.

<sup>34</sup> Murray, “Days of Forty Nine,” 6.

of broom.”<sup>35</sup> By 1907, Beacon Hill’s broom-covered slopes had become well known, prompting one writer to describe them as “crowned with [a] mass of golden yellow Scotch broom.”<sup>36</sup>

A few years later, another article (with an unconfirmed source) appeared in the *Daily Colonist* celebrating James Douglas’s many contributions to Victoria. One of his lasting achievements, according to the author, was Victoria’s broom-lined roads. Apparently, Douglas carried a handful of broom seeds in his pocket, scattering them as he drove throughout the city.<sup>37</sup> These newspaper accounts illustrate an interesting preoccupation with the source of introduced plants. Some botanists, such as Thomas Kirk, were also interested in “certifying the dates of introduction” of many of the non-native plants that had naturalized in another colony – New Zealand.<sup>38</sup> However, attempting to determine the source and/or date of entry of an introduced plant can be difficult, if not impossible.<sup>39</sup> Furthermore, this approach suggests a simple cause-and-effect relationship between the introduction and naturalization of biota and ecological change.<sup>40</sup> But this relationship is never simple. Graeme Wynn points out that the naturalization of introduced flora reflects “a combination of ecological-climatic and historical influences.”<sup>41</sup> More often than not, there are multiple introductions of alien biota and multiple factors causing ecological change.<sup>42</sup>

That both Grant and Douglas were able to obtain seeds native to Europe illustrates not only the widespread interest in plants as part of the colonial effort but also the relative ease with which colonists could obtain alien plant material. In fact, any number of settlers on southern Vancouver Island may have purchased Scotch broom seeds through mail order seed catalogs and planted them in their gardens.<sup>43</sup> Broom seeds were available for sale as early as 1827 and were advertised in the *Catalogue of Fruit and Ornamental Trees, Flowering Shrubs, Garden Seeds*

<sup>35</sup> Ibid. Beacon Hill is approximately two kilometres south of Victoria.

<sup>36</sup> Herbert Cuthbert, “For the Tourists,” *Daily Colonist* (Victoria), 21 May 1907, 17.

<sup>37</sup> J.G., “Victoria,” 17.

<sup>38</sup> Thomas Kirk, “On Naturalized Plants of New Zealand, especially with regard to those occurring in the Province of Auckland,” *Proceedings of the New Zealand Institute* 2 (1869): 145. Cited in Wynn, “Remapping Tutira,” 422.

<sup>39</sup> Wynn, “Remapping Tutira,” 424.

<sup>40</sup> Cronon, *Changes in the Land*, 161.

<sup>41</sup> Wynn, “Remapping Tutira,” 424.

<sup>42</sup> Cronon, *Changes in the Land*, 162.

<sup>43</sup> Buying and collecting plant material for gardens and herbariums was popular in the nineteenth and early twentieth centuries. Some have called that era the “golden age” of plant collecting. See Allan Stoner and Kim Hummer, “19th- and 20th-Century Plant Hunters,” *HortScience* 42, no. 2 (2007): 197.

and Green-House Plants ... Cultivated and For Sale at the Toronto Nursery, the first nursery catalogue published in Upper Canada.<sup>44</sup> Before the establishment of Canadian nurseries, European plant material could be purchased through advertisements in newspapers and broadsheets.<sup>45</sup> Botanical gardens were another source of seeds in the nineteenth century. The Kew Botanical Gardens in Great Britain was one well-known source of Old World seeds. In 1892, the Kew offered broom seeds in "moderate quantities" to "regular correspondents" and other botanic gardens.<sup>46</sup>

Victoria also had its own nurseries, such as "Mitchell and Johnston: Nursery and Seedman, Landscape Gardeners," who sold both seeds and plant stock in downtown Victoria in 1871.<sup>47</sup> Additionally, Victoria's "Layritz Nursery," which claimed to "take the lead in choice and reliable hardy nursery stock," advertised its free mail-order catalogue in the *Salt Spring Island Parish and Home* magazine in July 1897.<sup>48</sup> Seeds were imported to Vancouver Island not only by immigrants but also by Canada's Dominion agriculturalists. For example, in 1889 the Dominion Experimental Farm in Indian Head, North-West Territories, planted forty-eight broom plants in order to determine their agricultural viability.<sup>49</sup> However, it was reported in 1890 that all the plants had died.<sup>50</sup>

The ready availability of Scotch broom seeds, and attempts by Dominion agriculturalists to introduce this species to Canada's North, raise an important question: Why would Douglas or Grant, or anyone for that matter, introduce broom to southern Vancouver Island? The evidence suggests that broom was intentionally introduced because of its cultural significance as well as its perceived beauty and utility.

Well known in Scotland,<sup>51</sup> broom was so plentiful that many places were named after it, such as "Broomhouses, Broomilaw, Broomhill and Broomdykes."<sup>52</sup> It also figured prominently in Scottish lore and

<sup>44</sup> Eileen Woodhead, *Early Canadian Gardening: An 1827 Nursery Catalogue* (Montreal: McGill-Queen's University Press, 1998), 3, 13, 141-42.

<sup>45</sup> *Ibid.*, 4.

<sup>46</sup> "List of Hardy Herbaceous Plants and of Trees and Shrubs," *Bulletin of Miscellaneous Information Royal Gardens, Kew* (1892): 23-24.

<sup>47</sup> Edward Mallandaine, *First Victoria Directory and British Columbia Guide* (Victoria: E. Mallandaine, 1871).

<sup>48</sup> *Salt Spring Island Parish and Home*, July 1897.

<sup>49</sup> *Experimental Farms: Reports for 1890* (Ottawa: Brown Chamberlin, Queen's Printer, 1891), 289.

<sup>50</sup> "Plantés en 1889," *Document de la session: première session du septième Parlement du Canada* 24, no. 6c (1891): 303.

<sup>51</sup> W.J. Hooker, *Flora Scottica or a Description of Scottish Plants Arranged Both According to the Artificial and Natural Method* (London: Archibald Constable and Co., 1821), 211.

<sup>52</sup> George Johnston, *The Botany of the Eastern Borders with the Popular Names and Uses of Plants and of the Customs and Beliefs Which Have Been Associated with Them* (London:

literature. The Gaelic word for broom, *bealaidh* or *bealuidh*, means “the plant that Belus favored.” Yellow was also the favourite colour of the Druids and the bards.<sup>53</sup> The poetry of Robert Burns, the most famous Scottish bard, has numerous references to broom. In “Elibanks and Elibraes,” Burns writes: “Your birds were singin’ cheery; When thro’ your waving’ yellow broom, I wander’d wi’ my dearie!”<sup>54</sup> Scotch broom also had a masculine and heroic history: it was the badge or symbol of the “Forbes” clan.<sup>55</sup> According to *Modern Herbal*, published by Mary Grieve in 1930, the members of this clan wore sprigs of broom in their bonnets as a symbol of their chieftain’s heroism.<sup>56</sup> Scotch broom was also important for some Scottish settlers. In 1845, one former resident of New Brunswick wrote: “Scotch settlers may be known by the taste shown in selecting a garden spot ... beneath them a seat is placed, and in some cherished spot, watched over with the tenderest care, is an exotic sprig of heath or broom.”<sup>57</sup> Margaret Ormsby argues that flower gardens were an important part of the colonial effort at Fort Victoria because they were “all sweetly reminiscent of ‘home.’”<sup>58</sup> Perhaps colonist and immigrants introduced broom as a way to create their “own idealized order of nature and culture,” which would connect them to their “collective and primeval past.”<sup>59</sup>

There may have been more practical reasons for introducing this Old World plant. Broom has medicinal, utilitarian, and agricultural uses. According to the December 1894 edition of the *Canadian Druggist*, broom was considered a medicinal plant that grew “satisfactorily in the colony of Victoria.”<sup>60</sup> It has been used as a remedy for dropsy, as a diuretic, as a blood staunch, as an unguent, as a cathartic, and as

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John Van Voorst, 1853), 51.

<sup>53</sup> John Cameron, *Gaelic Names of Plants* (Edinburgh: William Blackwood and Sons, 1883), 14.

<sup>54</sup> “Elibanks and Elibraes,” *The World Burns Club*, 2004, available at [http://www.cobbler.plus.com/wbc/poems/translations/elibanks\\_and...](http://www.cobbler.plus.com/wbc/poems/translations/elibanks_and...) (viewed 14 April 2008). See also Allan Cunningham, *The Complete Works of Robert Burns* (Boston: Phillips, Sampson and Company, 1855), 128, 146, 907, 999, 1298.

<sup>55</sup> Cameron, *Gaelic Names of Plants*, 14.

<sup>56</sup> “Scottish Plant Uses,” available at <http://193.62.154.38/cgi-bin/nph-readbtree.pl/usedata> (viewed 16 May 2008).

<sup>57</sup> F. Bevan, *Sketches and Tales Illustrative of Life in the Backwoods of New Brunswick, North America, Gleaned from Actual Observations and Experience During a Residence of Seven Years in that Interesting Colony* (London: George Routledge, 1845), 22.

<sup>58</sup> M.A. Ormsby, *British Columbia: A History* (Vancouver: Macmillan, 1958), 107.

<sup>59</sup> Mark Francis and Randolph T. Hester, Jr., eds., *The Meaning of Gardens* (Cambridge: MIT Press, 1995), 2.

<sup>60</sup> “Appendix A,” *Canadian Druggist* 6, no. 12 (1894): 201.

an emetic. It was also considered an intoxicant.<sup>61</sup> Broom was used for thatching, fencerows, leather tanning, veneer, and as a source of cloth fibre.<sup>62</sup> “Brooms” were made out of its wiry branches.<sup>63</sup> Sheep were known to “be very fond of the broom,”<sup>64</sup> and it was used as cattle fodder.<sup>65</sup>

Broom may also have been unintentionally introduced to southern Vancouver Island in discarded ship ballast.<sup>66</sup> Prior to the 1880s, rocks, sand, and dirt were used to improve the stability and control of ships.<sup>67</sup> When a ship arrived at port, sometimes the ballast was dumped, either overboard or onto so-called “ballast grounds.”<sup>68</sup> In the mid-nineteenth century, ballast grounds, or heaps, “became common botanizing areas due to the uncommon and interesting species that could be found growing on and among them.”<sup>69</sup> The Torrey Botanical Club reported in 1892 that Scotch broom and other foreign plants had been appearing on ballast heaps in Bethlehem (Pennsylvania), New York, Camden, and Philadelphia.<sup>70</sup> The unique biology of broom may have facilitated its survival in solid ship ballast. Broom seeds have an impervious seed coat that can delay germination for up to thirty years.<sup>71</sup> Dormant seeds could easily have survived in ballast, deep within the holds of ships.

<sup>61</sup> Johnston, *Botany of the Eastern Borders*, 51-52; Marc Hoshovsky, “Elemental Stewardship Abstract for *Cytisus scoparius* and *Genista monspessulanus*, Scotch Broom, French Broom,” *Nature Conservancy* (2000): 2. See also Eugene H. Trudel, J.G. Bibaud, P. Munro, J. Emery-Codere, P. Beaubien, D. D’Orsonnens, H. Pelletier, and J.P. Rottot, *Traité élémentaire de matière médicale et guide pratique* (Montreal: L’Université Victoria, 1890), 417.

<sup>62</sup> Hoshovsky, “Elemental Stewardship,” 2-3.

<sup>63</sup> Johnston, *Botany of the Eastern Borders*, 52.

<sup>64</sup> *Ibid.*, 51.

<sup>65</sup> Hoshovsky, “Elemental Stewardship,” 3.

<sup>66</sup> D.G. Pfeiffer, “*Arytainilla spirtiophilla* (Foersta) (Homoptera: Psyllidae) on *Cytisus scoparius* (L.) Link. in Virginia: First Record on EA,” *Journal of Entomological Science* 21, no. 3 (1986): 214. Ballast is “any heavy material placed in a ship’s hold with the object of sinking her deeper in the water and thereby rendering her capable of carrying sail without danger of being over-set.” The lighter the cargo, the more ballast is required to lower the ship in the water, thus adjusting the centre of gravity. See *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge: Volume 3* (London: Charles Knight, 1835), 332.

<sup>67</sup> “Non-Native and Invasive Species,” *Smithsonian Marine Station at Fort Pierce*, available at <http://www.sms.si.edu/irlspec/Nonnatives.htm> (viewed 18 May 2008).

<sup>68</sup> Edward L. Mills, Joseph H. Leach, James T. Carlton, and Carol L. Secor, “Exotic Species in the Great Lakes: A History of Biotic Crises and Anthropogenic Introductions,” *Journal of Great Lakes Research* 19, no. 1 (1993): 4.

<sup>69</sup> Sasha W. Eisenman, Katrina Dulatas, Hope Elizabeth Clennon, and Lena Struwe, “Ballast Dumps from the Late 1800s,” *Department of Plant Biology and Pathology, Rutgers University* (2006), available at <http://herbarium.rutgers.edu/bsa2006poster.pdf> (viewed 4 September 2008).

<sup>70</sup> Thos C. Porter, “Ballast-Plants at South Bethlehem, Pennsylvania,” *Bulletin of the Torrey Botanical Club* 19, no. 1 (1892): 9-10.

<sup>71</sup> Peterson and Prasad, “Biology of Canadian Weeds,” 501.

Furthermore, some riverbank studies have suggested that broom seeds can be distributed by water.<sup>72</sup>

The significance of solid ship ballast as a vector for non-native plants cannot be overemphasized. A 1993 study in the *Journal of Great Lakes Research* concluded that 31 percent of the alien flora and fauna in the Great Lakes Basin were introduced by the dumping of solid ship ballast.<sup>73</sup> The British Columbia Ministry of Environment similarly credits ballast water dumping for the introduction of many alien species to the province.<sup>74</sup> The dumping of solid ship ballast most certainly contributed to the spread of Scotch broom in eastern North America. It is likely that Scotch broom was similarly introduced at harbours and port cities in the Pacific Northwest.<sup>75</sup>

By the 1870s, broom had become well established on Vancouver Island. While on his survey of southern British Columbia (1875-78), George Mercer Dawson, of the Geological Survey of Canada, observed that broom had naturalized in Victoria and was “abundant” along “roadsides and waste-places.”<sup>76</sup> In November 1889, Adam Brown, an MP, observed “lots of Scotch broom” during his drives through the outskirts of Victoria.<sup>77</sup> By 1909, *The Cyclopedia of American Horticulture* declared Scotch broom as naturalized on Vancouver Island.<sup>78</sup>

Not long after E.J. Hughes painted *Trees, Sooke Harbour, BC*, A.A. Warren of the *Daily Colonist* wrote: “truly these glistening patches of gold enriching the pattern of the hillsides, have now become a feature of the Sooke landscape that is as natural to thought as the well known ‘blue’ of its hills.”<sup>79</sup> This so-called “natural feature” of the Sooke landscape was, in fact, the result of numerous intentional and unintentional introductions.

The ability of plant species to naturalize on non-native landscapes is well known. George P. Marsh, in *Man and Nature, or Physical Geography*

<sup>72</sup> P.A. Williams, “Aspects of the Ecology of Broom (*Cytisus scoparius*) in Canterbury, New Zealand,” *New Zealand Journal of Botany* 19 (1981): 31-43. Cited in Peterson and Prasad, “Biology of Canadian Weeds,” 501.

<sup>73</sup> Mills et al., “Exotic Species in the Great Lakes,” 1.

<sup>74</sup> Gilkeson et al., *Alive and Inseparable*, 228.

<sup>75</sup> During one year alone, according to Grant, fifty ships arrived and departed from Vancouver Island ports, indicating that ships were “high potential” vectors for non-native flora and fauna. See Grant, “Description of Vancouver Island,” 312-13.

<sup>76</sup> Douglas Cole and B. Lockner, eds., *The Journals of George M. Dawson: British Columbia, 1875-1878* (Vancouver: UBC Press, 1989), 15; and George M. Dawson, “Gorse and Furze,” *Science* 15, no. 379 (9 May 1890): 291.

<sup>77</sup> Adam Brown, “The Great West,” *Daily Colonist* (Victoria), 18 January 1889, 4.

<sup>78</sup> L.H. Bailey, *Cyclopedia of American Horticulture*, 6th ed. (London: Macmillan, 1909), 441.

<sup>79</sup> Warren, “What Prompted Captain Grant,” 15.

as *Modified by Human Action*, notes: “whenever man has transported a plant from its native habitat to a new soil, he has introduced a new geographical force to act upon it, and this generally at the expense of some indigenous growth.”<sup>80</sup> However, Scotch broom was not a force acting alone on the landscape; rather, it acted in concert with the biophysical features of southern Vancouver Island as well as with several key cultural factors, and this resulted in its rapid naturalization.

Native to Europe and Africa, Scotch broom has several important biological features that make it a successful invasive species.<sup>81</sup> It is prolific, producing eighteen thousand to thirty-one thousand five hundred seeds annually. Because of its strong seed coat dormancy, its seeds remain viable in the forest floor seed bank for up to thirty years.<sup>82</sup> The seed pods often open explosively, dispersing their seeds widely.<sup>83</sup> Its drought tolerance, deep rooting, rapid root/shoot growth, and ability to fix nitrogen<sup>84</sup> enable this plant to grow on strongly drained soils with a medium soil nutrient regime,<sup>85</sup> a xeric-very xeric (dry to very dry) soil moisture regime, and a sandy texture.<sup>86</sup> Another important feature of this shade-intolerant species is its ability to germinate and multiply on disturbed sites, including sites that have experienced low to moderate intensity burns.<sup>87</sup> Scotch broom invades pastures, cultivated fields, dry scrubland, so-called wasteland (e.g., abandoned fields), native grasslands, cleared land, roadsides, and areas that have been logged.<sup>88</sup>

The climate and biophysical features of southern Vancouver Island were close to optimal for the biology and reproductive strategies of broom. The three broom seedlings that the Muirs found on Grant’s former homestead, located a few kilometres west of Sooke Harbour and present-day Sooke, are found within the Very Dry Maritime Coastal Western Hemlock (CWHxm1) Biogeoclimatic subzone. This subzone has warm, dry summers; long growing seasons; mild moist, winters; and

<sup>80</sup> George P. Marsh, *Man and Nature or Physical Geography as Modified by Human Action* (New York: Charles Scribner, 1865), 58.

<sup>81</sup> USDA Germplasm Resources Information Network, available at <http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?437965> s.v. “*Sarothamnus vulgaris*.” (viewed 7 May 2008).

<sup>82</sup> Peterson and Prasad, “Biology of Canadian Weeds,” 500, 501.

<sup>83</sup> Hoshovsky, “Elemental Stewardship,” 3.

<sup>84</sup> The roots of Scotch broom have a symbiotic relationship with the *Rhizobium* root bacteria. Within root nodules, the bacteria provide nitrogen for the plant (an important macronutrient), while the roots provide carbohydrates for the bacteria. See Peter H. Raven, Ray F. Evert, and Susan E. Eichhorn, *The Biology of Plants*, 4th ed. (New York: Worth Publishers, 1987), 177–78.

<sup>85</sup> Peterson and Prasad, “Biology of Canadian Weeds,” 499, 500–1.

<sup>86</sup> Hoshovsky, “Elemental Stewardship,” 2.

<sup>87</sup> Peterson and Prasad, “Biology of Canadian Weeds,” 502.

<sup>88</sup> Hoshovsky, “Elemental Stewardship,” 2.

is prone to water deficits.<sup>89</sup> Victoria lies in the Moist Maritime Coast Douglas Fir (CDFmm) subzone, which is restricted to low elevations along southeast Vancouver Island from Bowser to Victoria, the Gulf Islands south of Cortes Island, and a narrow strip along the Sunshine Coast near Halfmoon Bay.<sup>90</sup> This subzone is within a rain shadow and has warm, dry summers; mild, wet winters; a long growing season; and water deficits in several ecotypes.<sup>91</sup> These are ideal climatic conditions for Scotch broom. Furthermore, the dry, rocky landscape with sandy soils, prairies, and open Garry oak woodlands noted by Grant provided ideal habitat for this shade-intolerant invasive species.<sup>92</sup>

The broom seedlings allegedly saved by Ann Muir illustrate the fact that human choices and activities are important factors in the naturalization of non-native invasive plants. Evans points out that weeds must “be seen as agents of nature bent on colonizing an ecological niche created by the activities of another weedy species, *Homo sapiens*.”<sup>93</sup> Human activities such as the agricultural and urban development of southern Vancouver Island created habitat suitable for the rapid naturalization of broom. As settlers logged, cleared, and converted their properties to agricultural uses they created niches for broom seeds. Like those of many other plant species, broom seeds are easily transported over the landscape by carriage wheels, cattle, horses, humans, and wildlife. In 1849 there were only thirty-two hectares under cultivation at Fort Victoria and fourteen hectares at Sooke.<sup>94</sup> By 1853 there were approximately one hundred and ninety-four hectares under cultivation.<sup>95</sup> In 1858, the HBC farm at Lake Hill was large enough to support seventeen hundred sheep.<sup>96</sup> In 1865, Matthew Macfie, author of an assessment of Vancouver Island, wrote that there were “several large farms” in Metchosin (east of Grant’s farm) that were in a “prosperous” condition.<sup>97</sup> As the area of disturbed land on southern Vancouver Island increased, so did suitable habitat for broom.

<sup>89</sup> R.N. Green, *A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region* (Victoria: Ministry of Forests, 1994), 63–64.

<sup>90</sup> *Ibid.*, 46. See also *Biogeoclimatic Ecosystem Classification Subzone/Variant Map for the South Island Forest District* (Victoria: Ministry of Forests and Range, 2008).

<sup>91</sup> Green, *Field Guide*, 46.

<sup>92</sup> Grant, “Description of Vancouver Island,” 270, 281–83.

<sup>93</sup> Evans, *War on Weeds*, 189.

<sup>94</sup> Grant, “Description of Vancouver Island,” 272, 283.

<sup>95</sup> *Ibid.*, 274.

<sup>96</sup> Hubert Howe Bancroft, *The History of British Columbia, 1792–1887* (San Francisco: The History Company, 1887), 261.

<sup>97</sup> Matthew Macfie, *Vancouver Island and British Columbia: Their History, Resources, and Prospects 1865* (Toronto: Coles, 1972), 185.

The intentional burning of the landscape by indigenous Coast Salish peoples, such as the T'Sou-ke, Lekwungen (Songhees), and Saanich may also have contributed to the spread of this fire-resistant species.<sup>98</sup> Fire not only eliminates vegetative competition, thus creating ideal germination and growing conditions, but also causes broom roots to resprout vigorously.<sup>99</sup> Other traditional Coast Salish land uses, such as the post-burning cultivation of camas (*Camassia spp.*) and riceroot (*Fritillaria spp.*) as well as the cultivation of potatoes, may also have facilitated the naturalization of Scotch broom.<sup>100</sup> As colonists and settlers displaced Aboriginal peoples from their food-gathering areas, broom may have naturalized quickly on these disturbed sites. Similarly, natural wildfires and fires caused by settlers could have contributed to the establishment of broom. Fires frequently occurred in Beacon Hill Park. In 1907, the *Beacon Hill Park Keepers Report* noted that grass fires had killed most of the broom on Beacon Hill.<sup>101</sup> By 1913, Beacon Hill was once again covered with a "crown" of broom.<sup>102</sup> Grass fires, while killing off broom, may have also facilitated its germination and reestablishment.

By the turn of the century, broom had become an eyesore or an irritant to some of Victoria's residents. In 1900, the City Council passed a by-law to eliminate all the broom growing alongside the road from Ross Bay Cemetery to Moss Street.<sup>103</sup> However, a group of prominent citizens sought to cancel the order because it believed that broom would contribute to the city's beautification.<sup>104</sup> It is not known if this by-law

<sup>98</sup> For primary sources about Aboriginal fire, see *The Colonization of Vancouver Island* (London: Burrup and Son, 1849), 17-19; and Grant, "Description of Vancouver Island," 283. See also Nancy J. Turner, "Time to Burn: Traditional Use of Fire to Enhance Resource Production by Aboriginal People in British Columbia," in *Indians, Fire, and the Land in the Pacific Northwest*, ed. Robert Boyd (Corvallis: Oregon State University Press, 1999), 194-98, 203.

<sup>99</sup> Hoshovsky, "Elemental Stewardship," 3; and Ken Zielke, Jacob O. Boateng, Norm Caldicott, and Heather Williams, *Broom and Gorse in British Columbia: A Forestry Perspective Analysis* (Victoria: Ministry of Forests Silviculture Branch, 1992), iii.

<sup>100</sup> Nancy Turner and H.V. Kuhnlein, "Camas (*Camassia Spp.*) and Riceroot (*Fritillaria Spp.*): Two Liliaceous Root Foods of the Northwest Coast Indians," *Ecology of Food and Nutrition* 13, no. 4 (1983): 21. Grant observed some open meadowland near the mouth of the Sooke River, where the T'Sou-ke people were cultivating potatoes. See Grant, "Description of Vancouver Island," 283.

<sup>101</sup> Janice Ringuette, *Beacon Hill Park History*, chapter eight, pages 12,17 available at <http://www.beaconhillparkhistory.org> (viewed 17 July 2009).

<sup>102</sup> "An Hour on Beacon Hill," *Daily Colonist* (Victoria), 22 June 1913, II. Cited in Ringuette, *Beacon Hill Park History*, chapter nine, pages 10-11.

<sup>103</sup> "Broom," *Daily Colonist* (Victoria), 21 October 1900. It is unclear to what actual road this article is referring. In fact, both May Street and Fairfield Road run west from Ross Bay Cemetery to Moss Street.

<sup>104</sup> *Ibid.*

was struck down, but, in 1907, broom was planted on the north side of Rockland Avenue as part of a boulevard beautification project.<sup>105</sup> The following year, Alstair Munro, an American tourist, suggested that Victoria should have a “Bringing Home the Broom” festival. He believed that “people would come to it from far and near ... [and that] it would be the gathering of the nations.”<sup>106</sup> The broom growing on Victoria’s boulevards, gardens, and parks undoubtedly impressed Munro. But broom’s rapid growth was also becoming a problem. In 1901, some park users complained that broom was blocking the view of cyclists on the southeast corner of Beacon Hill. Concerned that poor visibility would cause a “collision,” they suggested that the broom should be cut back “fifty-feet” from either side of the path.<sup>107</sup>

Broom’s rapid growth, pervasive rooting, and beauty were considered assets by the British Columbia Ministry of Highways and British Columbia Hydro, both of which, in the late 1940s, began using broom to stabilize and beautify their roadsides and power line rights-of-way.<sup>108</sup> Perhaps this was a result of the United States Department of Agriculture’s (USDA) successful experiments with broom as a dune stabilizer. In the 1930s, at their Astoria nursery, the USDA Soil Conservation Service tested seventy-five species of plants for their ability to stabilize sand dunes. The top three candidates were all non-native plants, one of which was Scotch broom.<sup>109</sup> The provincial government’s use of broom as a stabilizer undoubtedly facilitated its spread throughout Vancouver Island and the Lower Mainland.

In Hughes’s painting, *Trees, Sooke Harbour, BC*, there is no indication that Scotch broom is an invasive or alien element in the landscape. Today, under the rubric of biodiversity and ecosystem restoration, this “notorious green invader” is considered unwelcome.<sup>110</sup> That a plant that was in vogue at one time can become a pariah at another illustrates the socially constructed nature of weeds.<sup>111</sup> While some have suggested that broom was introduced by a single person and consequently spread throughout southern Vancouver Island, the evidence suggests that it was introduced multiple times by various vectors, with human activities playing a key role in its naturalization. Given the important role that

<sup>105</sup> “Adopted Plans for Street Boulevards,” *Daily Colonist* (Victoria), 25 July 1907, 11.

<sup>106</sup> “Carnival Should Be Instituted Here,” *Daily Colonist* (Victoria), 19 June 1908, 6.

<sup>107</sup> “Grass Fires,” *Daily Colonist* (Victoria), 27 August 1901, 4.

<sup>108</sup> Zielke et al., *Broom and Gorse*, 500.

<sup>109</sup> Frank Reckendorf, Don Leach, Robert Baum, and Jack Carlson, “Stabilizing of Sand Dunes in Oregon,” *Agricultural History* 59, no. 2 (1985): 266.

<sup>110</sup> Gilkeson et al., *Alive and Inseparable*, 226.

<sup>111</sup> Evans, *War on Weeds*, 2.

culture played in the establishment of broom it would follow that its “invasive” designation may be a misnomer. Broom did not act alone; rather, it partnered with humans as they moved into and modified new landscapes. It is difficult to know exactly what southern Vancouver Island looked like prior to European contact. However, it is clear that, as Europeans and their biota arrived in British Columbia, dramatic transformation of the landscape began.