Individual Species Treatments

The rest of this manual consists of descriptive information on each of the 31 species for which we gathered information, based on published sources and our own research and experience. Each species description includes a range map for northern B.C., photographs of the plant's habit and seeds, general background information, description of the growth form, site preferences, seed information, techniques for seed production, harvesting and seed processing information, considerations for use in revegetation, and other general comments on the properties or husbandry of the species. If not otherwise cited, information has been derived from the Symbios Research & Restoration research program, some results of which have been previously summarized in Burton and Burton (2001b). Reference is also made to a number of other sources and researchers, particularly from Alberta where valuable research on the use of native grasses has been carried out over the last two decades. General comments from growers and practitioners are used when no quantitative information is available on a particular species. When noted, information from related species has been extrapolated to similar species presented in this manual.

A map of its geographical distribution in northern British Columbia is provided for each species. Each map is first and foremost a "dot map" at a scale of 1:7,000,000, documenting the location of verifiable plant collections or sightings. Three primary sources of information are portrayed, each by a different symbol (as shown in the map keys):

- Herbarium collections, as accessioned at the National Museum of Nature (Aylmer, Quebec), Agriculture and Agri-foods Canada (Ottawa, Ontario), the Royal British Columbia Museum (Victoria, B.C.), the University of Victoria (Victoria, B.C.), the University of British Columbia (Vancouver, B.C.), the University of Northern British Columbia (formerly the herbarium of the Prince George Forest Region, in Prince George, B.C.), and the Prince Rupert Forest Region (B.C. Forest Service, Smithers, B.C.);

- Relevé data from the master database of more than 7000 sample plots collected over more than 20 years throughout the province in support of the biogeoclimatic ecological classification (BEC) program; this was made available to the authors by the B.C. Ministry of Forests; and

- 1076 accessions of seed collected by Symbios Research and Restoration in support of the five-year research program described in Burton and Burton (2001b).

The biogeoclimatic subzone in which a species was observed has been shaded yellow, and represents an extrapolation of the likely range of the species. It should be noted, however, that the central Interior of northern British Columbia has been only sparsely botanized, especially away from main roads. So it is likely that sub-zones similar and adjacent to those shaded in each map also support the species in question. The subzones represented by Symbios seed lines is further highlighted with green shading.

There is a considerable reference list associated with this manual because an effort was made to gather as much information as possible about each species. Some of the information is old (dating back to the 1930's) and second-hand (as denoted by an asterisk and footnote), but it was considered important to provide the reader with access to all primary sources. We downloaded much valuable information from the Fire Effects Information System (available at www.fs.fed.us/database/feis/plants; FEIS various dates), maintained by the U.S. Forest Service; many of the obscure references were derived from this database. Most species descriptions were derived from the *Illustrated Flora of British Columbia* (in seven volumes, by Douglas et al. 1998-2001). Growth form and site preferences were gleaned from a variety of sources but *Plants of Northern British Columbia* by MacKinnon et al. (1992) was particularly useful in this regard.

Standard biogeoclimatic acronyms, as utilized for ecological site classification and land management across B.C., are employed in the text. The biogeoclimatic zones found north of the 52nd parallel in B.C. are:

- AT = Alpine Tundra;
- BWBS = Boreal White and Black Spruce;
- CWH = Coastal Western Hemlock;
- ESSF = Engelmann Spruce - Subalpine Fir;
- ICH = Interior Cedar-Hemlock;
- MH = Mountain Hemlock;
- SBPS = Sub-Boreal Pine and Spruce;
- SBS = Sub-Boreal Spruce; and
- SWB = Spruce-Willow-Birch.

Interior subzone designations use the following notation, referring to the precipitation regime and temperature regime relative to other subzones within the same biogeoclimatic zone:

- First letter, x = very dry, d = dry, m = moist, w = wet, v = very wet;
- Second letter, h=hot, w = warm, m=mild, k = cool, c = cold, v = very cold.

So "the SBSdk," for example, refers to the dry cool subzone of the Sub-Boreal Spruce zone. For background and details of the British Columbia BEC system, and environmental and ecological descriptions of the BEC zones and subzones, readers are referred to Meidinger and Pojar (1991).

Site or ecosystem affinities of individual species can also be identified in some cases. Here we follow BEC ecosystem classification protocols (Meidinger and Pojar 1991, Banner et al. 1993), in which the range of soil moisture regime (SMR) and soil nutrient regime (SNR) conditions are coded on an edatopic grid as follows:

SMR:	SNR: Very poor A	poor B	med-ium C	rich D	very rich E
very xeric 0					
xeric 1					
subxeric 2					
submesic 3					
mesic 4					
subhygric 5					
hygric 6					
subhydric 7					

A “modal site” or “modal ecosystem” refers to those conditions characterized by a more or less mesic SMR and a more or less medium SNR, such that the vegetation expresses the influence of the regional climate more than the influence of local soils and topography. In the individual species treatments, site preferences for individual species (when known) are expressed on the basis of SMR (where 0 is dry and 7 is wet, as above) and SNR (where A is very poor and E is very rich) affinities as documented for different biogeoclimatic subzones in northern B.C. by Beaudry et al. (1999).

Collectively, this information provides the practitioner a good picture of the ecology of these native plants, and where and how you might use them. Some published descriptions have been modified to reflect recent observations and experience of the authors. Where specific information is available, recommendations for row spacing, seeding density and seeding depth are made. If no species-specific information was available, general guidelines gleaned from various guides and propagation manuals are recommended. Sometimes recommendations are made based on information for different species of the same genus and are duly noted as such.

Once again, we emphasize that this manual is a work in progress. The recommendations provided here are undoubtedly inappropriate for many different scenarios, and should not be used as rigid prescriptions. Rather, users of this information are encouraged to experiment and try new approaches for growing, seeding, mixing, and monitoring these and other native plant species. Growers and revegetation practitioners are urged to record their own observations and experience with each species in the space provided for notes after most species descriptions.