

### Riparian Areas

Riparian areas (also known as 'riparian zones') are located next to watercourses and can broadly be described as the upland areas adjacent to and nearby a watercourse. Riparian areas can include stream and river banks or lakeshores and are associated with all types of watercourses including swamps, wetlands, tributaries, side channels and intermittently wetted areas.

Riparian areas have a direct influence on aquatic habitat, and form important transition zones between the aquatic and upland environments. As such, riparian areas directly contribute to fish habitat by providing shade, cover, food and nutrients for fish, as well as help to maintain water quality and moderate flows and temperatures that are critical for healthy fish habitat.

Leave strips are identified areas of land and vegetation that should remain in an undisturbed state and are intended to protect the integrity of the riparian area. Leave strips, usually extend inland a minimum of 15 meters from the high water mark or top of bank of any watercourse.

Where encroachment into a leave strip or riparian area is required, and harm to fish habitat is unavoidable, project plans should be forwarded to your local DFO office and/or appropriate Provincial or Territorial agency, in advance, for review and to obtain any necessary approvals. Please note, DFO does not require review of your project plans, if the project falls under the governance of a Pacific Region Operational Statement or the Provincial Riparian Areas Regulation, as they have been developed to ensure your works do not result in a harmful alteration, disruption, or destruction (HADD) of fish habitat. For further guidance on working in or around riparian areas, please contact your local DFO office.

For guidance on replanting within disturbed riparian areas, please refer to the section below, Riparian Revegetation.

**Please be advised, the information found on this webpage is provided as a general guide and does not constitute approval under any municipal, provincial and/or federal legislation.**

### Riparian Revegetation

Whether enhancing an existing riparian area on a previously disturbed site or re-establishing riparian vegetation from bare ground, it is important to observe the surrounding plant community of the disturbed area, specific to that biogeoclimatic zone, and select the appropriate species for site specific conditions.

- ▶ Revegetate with native plants in disturbed areas in riparian zones as per the criteria set below, and
- ▶ Immediately establish ground cover through seeding and/or other protective materials to control erosion and sediment, and to enhance germination of plants, and
- ▶ Conduct regular maintenance to improve the chances of survival within the first year of plant growth; which may include: routine irrigation, removal of invasive species, observation of poor growth, elevated erosion problems, and/or animal intrusion.

### Riparian Planting Criteria

1. All tree and shrub species should be native to the local area and where available, of guaranteed nursery stock for successful transplanting. Prior removal of invasive plant species (e.g. Himalayan blackberry, Japanese knotweed, scotch broom) may be required to enhance the survival of transplants.
2. When nursery stock is used, the correct botanical name should be used to order planting stock and tags should be left attached for field identification.
3. Purchased plant stock should be a minimum of 2 years old, and if transplanting an entire area, planted no greater than 2.0 meters apart for all stock.
4. Salvage native plants wherever possible for replanting of the disturbed area, which can also be counted as replacement vegetation.
5. For the replacement of individual trees, such as a danger or hazard tree, please refer to the British Columbia Provincial Tree Replacement Criteria. For individual shrub replacement, two shrubs should be replanted for each shrub removed; no replacement of shrubs for trees.
6. Fruiting trees and shrubs should be planted to promote recolonization by seed and provide wildlife food sources.
7. Stock should be planted in the fall (September to October) or spring (March to April) depending on local conditions.
8. To ensure success of the transplants, at least 80% should survive within the first year of planting.
9. Additional fertilizing, dedicated watering and/or replanting may be required to establish vigorous vegetative cover throughout the first year of growth.

### Suggested Planting Layout

The planting layout will depend on what is required to re-establish or enhance existing vegetation, species selected, density of plants, mature plant heights and planting system: linear, random, grid, etc. A Riparian Plant List is provided below to help with your selection of suitable plants. For site specific advice on plant selection and/or layout, please consult with a qualified professional or other knowledgeable source.

### Ground Seeding

Growth of ground cover after seeding reduces surface erosion, enhances soil absorption and stability, as well as promotes establishment of newly planted trees and shrubs. For optimal germination, seeding should occur in the spring or fall. However, when used as an erosion control measure, seeding is suitable anytime within the growing season to protect disturbed soils. Whether planting is scheduled immediately or not, seed should be placed on any disturbed soils that will lie dormant for a period of time. Laying mulch will further reduce erosion as well as enhance germination by protection of the seeds and retaining moisture.

A seeding mix should be selected based on site specific conditions (e.g. soil type, soil moisture, climate) but will usually include fall rye and local grasses. Advice from a local seed supplier or professional agrologist on seed mixture selection and application rates may be required.

### Riparian Plant List

The following plant list indicates those tree and shrub species native to the Pacific Region, that are recommended for planting within riparian areas next to streams, rivers, lakes and wetlands to enhance or maintain fish habitat values. This is not an exhaustive list as plant selection will vary according to site conditions and should serve only as a guide. Please consult with a qualified professional or other knowledgeable source for site specific advice.

Although some species below may be suitable for the marine environment, please refer to the Stewardship Series document, Shoreline Structures Environmental Design for further guidance on planting in and around tidal or estuarine areas.



| Common Name                       | Latin Name                         | Coastal <sup>1</sup> | Southern<br>interior <sup>1</sup> | Northern <sup>1</sup> |
|-----------------------------------|------------------------------------|----------------------|-----------------------------------|-----------------------|
| <i>Deciduous Tree Species</i>     |                                    |                      |                                   |                       |
| Vine Maple                        | <i>Acer circinatum</i>             | X                    |                                   |                       |
| Douglas Maple                     | <i>Acer glabrum var. douglasii</i> | X                    | X                                 | X                     |
| Broadleaf Maple                   | <i>Acer macrophyllum</i>           | X                    |                                   |                       |
| Red Alder                         | <i>Alnus rubra</i>                 | X                    |                                   |                       |
| Sitka Alder                       | <i>Alnus viridis ssp sinuata</i>   |                      | X                                 | X                     |
| Western Paper Birch (White Birch) | <i>Betula papyrifera</i>           | X                    | X                                 |                       |
| Black Hawthorn                    | <i>Crataegus douglasii*</i>        | X                    | X                                 |                       |
| Pacific Crabapple                 | <i>Malus fusca*</i>                | X                    |                                   |                       |
| Balsam Poplar (Black Cottonwood)  | <i>Populus balsamifera*</i>        | X                    | X                                 | X                     |
| Trembling Aspen                   | <i>Populus Tremuloides*</i>        |                      |                                   | X                     |
| Pin Cherry                        | <i>Prunus pensylvanica*</i>        | X                    |                                   |                       |
| Choke Cherry                      | <i>Prunus virginiana*</i>          | X                    | X                                 |                       |
| Cascara                           | <i>Rhamnus purshiana*</i>          | X                    | X                                 |                       |
| Mountain Ash                      | <i>Sorbus aucuparia*</i>           | X                    |                                   |                       |
| <i>Coniferous Tree Species</i>    |                                    |                      |                                   |                       |
| White Spruce                      | <i>Picea glauca</i>                | X                    | X                                 | X                     |
| Engelmann Spruce                  | <i>Picea Engelmann</i>             |                      |                                   | X                     |
| Black Spruce                      | <i>Picea mariana</i>               | X                    |                                   | X                     |
| Sitka Spruce                      | <i>Picea sitchensis</i>            | X                    |                                   |                       |
| Lodgepole Pine                    | <i>Pinus contorta</i>              |                      | X                                 | X                     |
| Western White Pine                | <i>Pinus monicola</i>              | X                    | X                                 |                       |
| Ponderosa Pine                    | <i>Pinus ponderosa</i>             |                      | X                                 | X                     |
| Douglas Fir                       | <i>Pseudotsaga menziesii</i>       | X                    | X                                 | X                     |
| Western Red Cedar                 | <i>Thuja picata</i>                | X                    | X                                 |                       |
| Western Hemlock                   | <i>Tsuga heterophylla</i>          | X                    |                                   |                       |



| <i>Shrub Species</i> |                                     |   |                |                |
|----------------------|-------------------------------------|---|----------------|----------------|
| Saskatoon            | <i>Amelanchier alnifolia</i> *      | X | X              | X              |
| Spreading Dogbane    | <i>Apocynum androsaemifolium</i>    |   | X              |                |
| Kinnickinnick        | <i>Arctostaphylos uva-ursi</i> *    | X | X              |                |
| Dwarf Birch          | <i>Betula nana &amp; glandulosa</i> |   |                | X              |
| Redstem Ceanothus    | <i>Ceanothus sanguineus</i>         |   | X              |                |
| Red Osier Dogwood    | <i>Cornus sericea</i> *             | X | X              | X              |
| Beaked Hazelnut      | <i>Corylus cornuta</i> *            | X | X              | X              |
| Ocean Spray          | <i>Holodiscus discolor</i>          | X | X              |                |
| Black Twinberry      | <i>Lonicera involucrata</i> *       | X | X              | X              |
| Mock Orange          | <i>Philadelphus lewisii</i>         |   | X              |                |
| Pacific Ninebark     | <i>Physocarpus capitatus</i>        | X | 2              |                |
| Prickly Rose         | <i>Rosa acicularis</i> *            |   | X              | X              |
| Nootka Rose          | <i>Rosa nutkana</i> *               | X | X              |                |
| Thimbleberry         | <i>Rubus parviflorus</i> *          | X | X              | X              |
| Salmonberry          | <i>Rubus spectabilis</i> *          | X | X              | X              |
| Willow               | <i>Salix spp</i>                    | X | X <sup>3</sup> | X <sup>3</sup> |
| Blue Elderberry      | <i>Sambucus cerulea</i> *           | X | X              |                |
| Red Elderberry       | <i>Sambucus racemosa</i> *          | X | X              | X              |
| Soopalallie          | <i>Shepherdia canadensis</i> *      |   | X              |                |
| Sitka Mountain Ash   | <i>Sorbus sitchensis</i> *          | X | X              | X              |
| Hardhack             | <i>Spiraea douglasii</i>            | X | X              | X              |
| Snowberry            | <i>Symphoricarpos alba</i> *        | X | X              | X              |
| Red Huckleberry      | <i>Vaccinum parviflorum</i> *       | X |                |                |
| Highbush Cranberry   | <i>Viburnum trilobum</i> *          | X | X              | X              |
| Saskatoon            | <i>Amelanchier alnifolia</i> *      | X | X              | X              |

Notes:

\* denotes fruit-bearing species

1 three generalized climatic regions within the Pacific Region

2 wet-belt south of Shuswap Lake only

3 live staking with spp. lasiandra and exigua are recommended if sufficient access to groundwater is available year round

