Riparian Buffer Considerations

Richard Fleenor

NRCS State Range Management Specialist

Riparian Forest Buffer (391)

An area predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.

Riparian Forest Buffer (391)

Purpose

Create shade to lower or maintain water temperatures to improve habitat for aquatic organisms

Riparian Forest Buffer (391)

Purpose

Create or improve riparian habitat and provide a source of detritus and large woody debris

Riparian Forest Buffer (391)

Purpose

Reduce excess amounts of sediment, organic matter, nutrients and pesticides in surface runoff and reduce excess nutrient and other chemicals in shallow ground water flow.

Riparian Forest Buffer (391)

Purpose

Reduce pesticide drift entering the water body

Riparian Forest Buffer (391)

Purpose

Restore riparian plant communities

Riparian Forest Buffer (391)

Purpose

Increase carbon storage in plant biomass and soils

Riparian Forest Buffer (391)

Purpose

Riparian Forest Buffer is not applied to stabilize stream banks or shorelines.

Critical Area Planting

Establishing permanent vegetation on sites that have or are expected to have, high erosion rates ……

- Stabilize stream and channel banks, pond and other shorelines, earthen features of structural conservation practices.

- Stabilize areas such as sand dunes and riparian areas.

Riparian Forest Buffer (391)

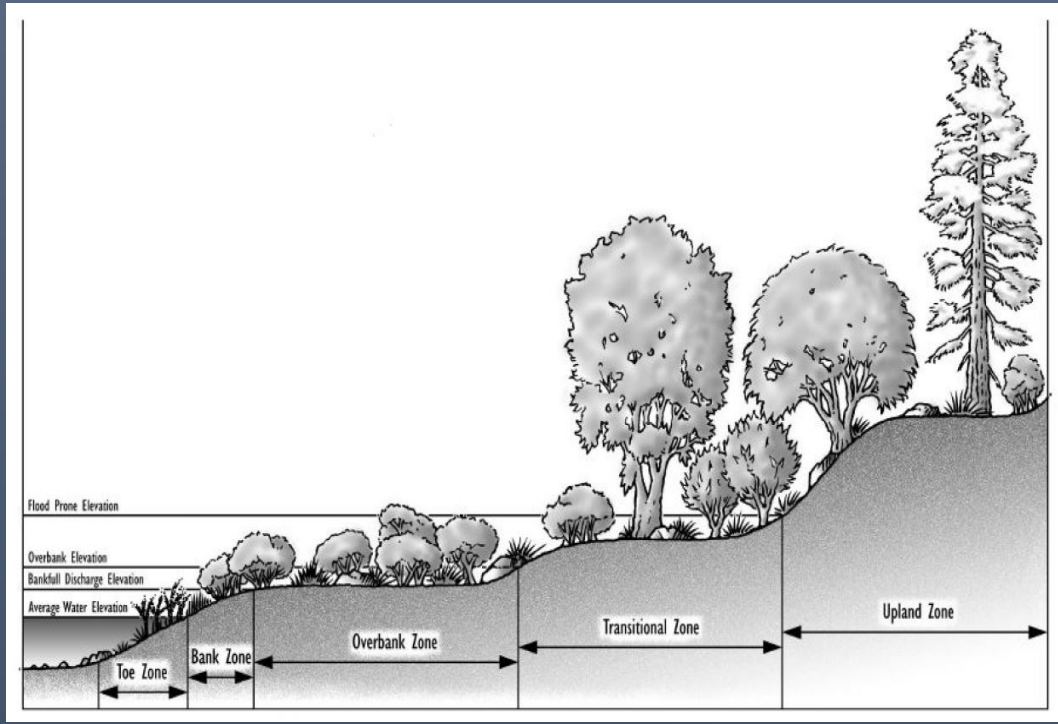
Purpose

Riparian Forest Buffer is not the practice for Beaver Dam Analog (BDA) installation

Riparian Plantings

A riparian area is the border between a waterway and the land. In plain language, riparian means river bank. The riparian area is made up of vegetation that is adapted to wet conditions.

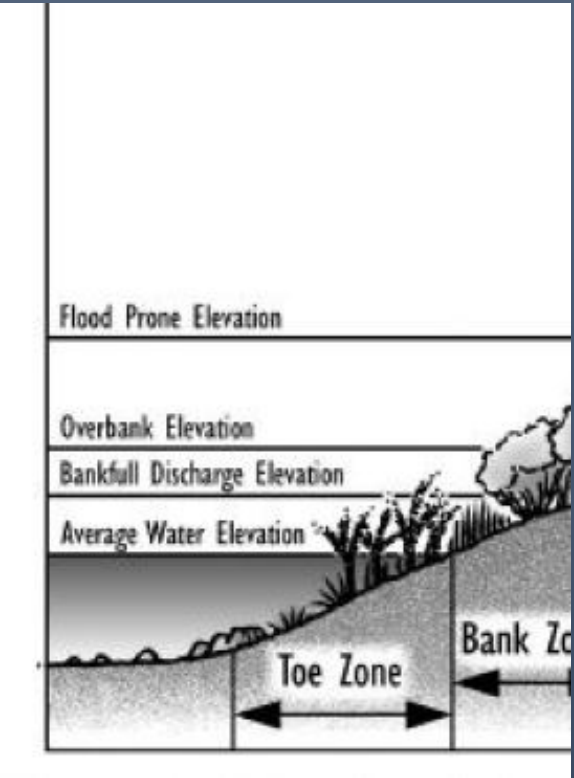
The Riparian Area



Riparian Area Zones

Riparian/Wetland Project Information Series No. 16: Riparian Planting Zones in the Intermountain West (PDF; 2.2 MB) ***Hoag, J.C., F.E. Berg, S. K. Wyman, and R.W. Sampson 2001****. USDA-NRCS Aberdeen Plant Materials Center. Aberdeen, ID. Mar. 2001. 24p. (ID# 1084).*

Toe Zone



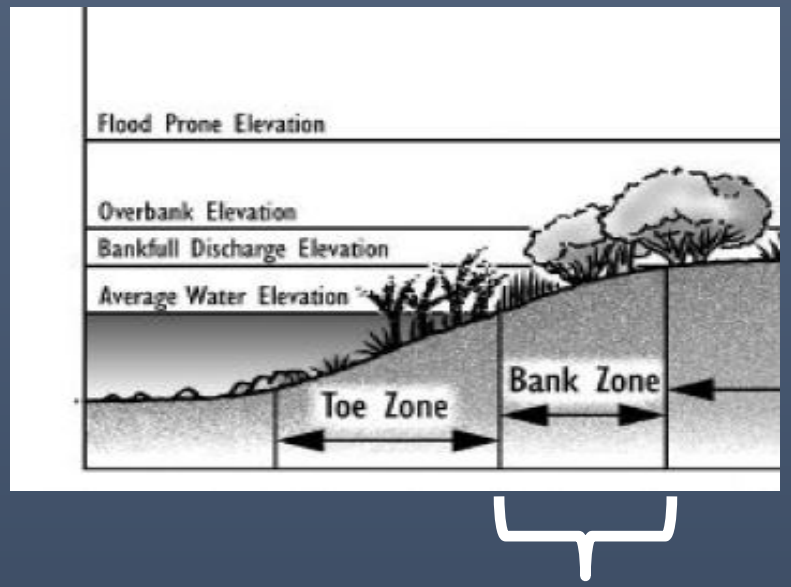
- Located below the average water elevation or the baseflow.
- The baseflow is that level where there is flow all summer long.

- Not a good place for woody species.
- Species appropriate for this area?

Toe Zone Vegetation

Bank Zone

- The area between the average water elevation and the bankfull discharge elevation.



Bank Zone Vegetation:

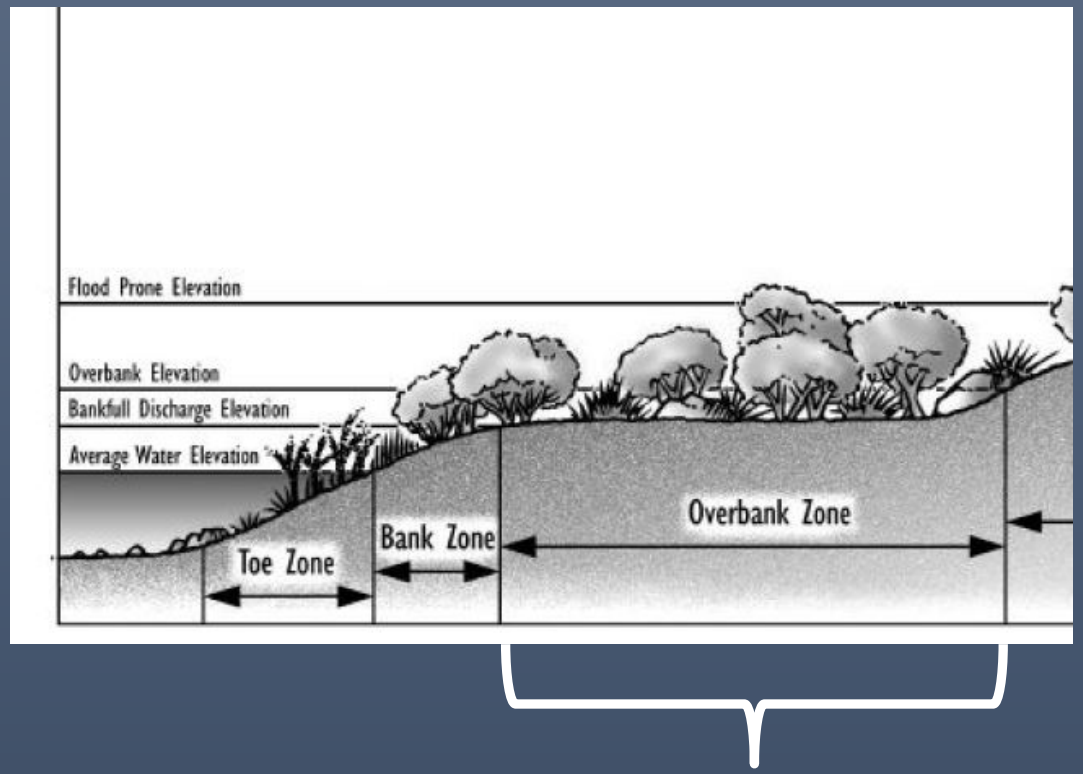
- Shrubby, flexible shrubs
- Plants that can handle long periods of inundation
- Examples: willows, alders, dogwood

Bankfull Discharge – The discharge corresponding to the stage at which the natural channel is full. This flow typically has a recurrence interval of 1.5 to 2 years.

Bank Full Level

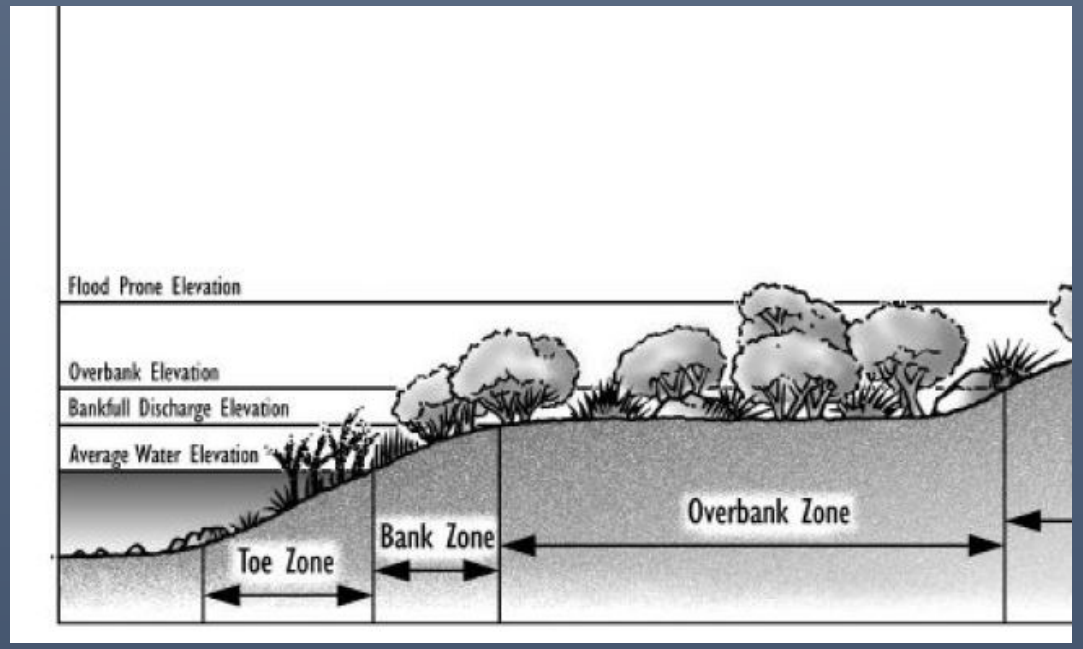
Overbank Zone

- Area between the bankfull discharge elevation and the overbank elevation.
- Generally flat and sporadically flooded about every 2 – 5 years



Overbank Zone

Redosier dogwood

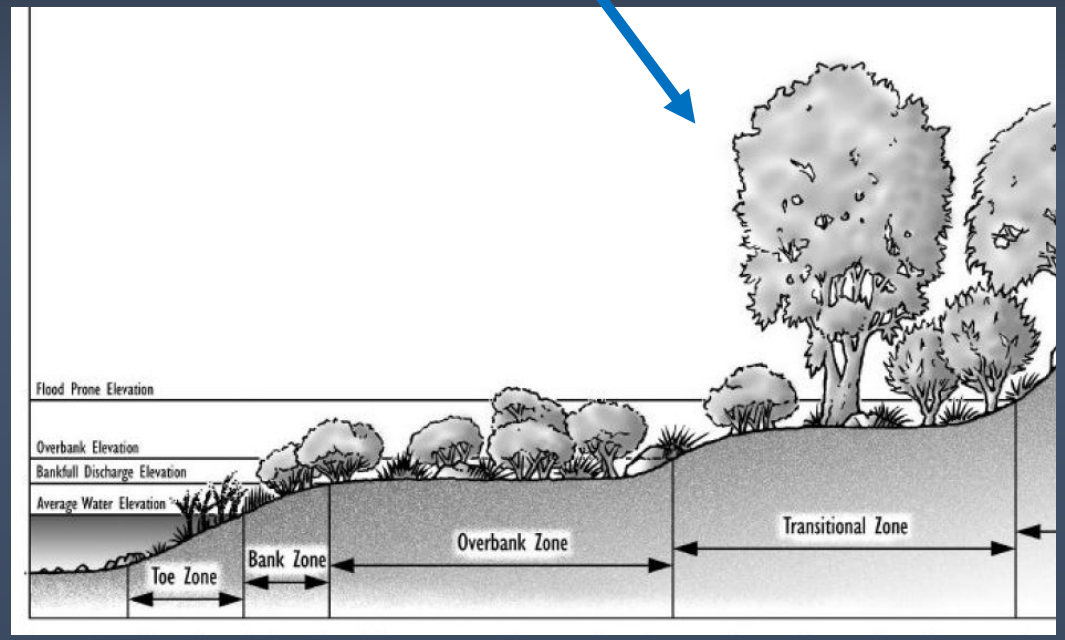


Overbank Zone

Overbank Vegetation

- Similar to Bank Zone vegetation (willows, dogwoods, etc.)
- Including (for MLRA 9) species like golden current, woods rose, black hawthorn, etc.

Transition Zone



- Located between the **overbank** elevation and the **flood prone** elevation
- The flood prone elevation is flooded about every 50 years.

Transition Zone

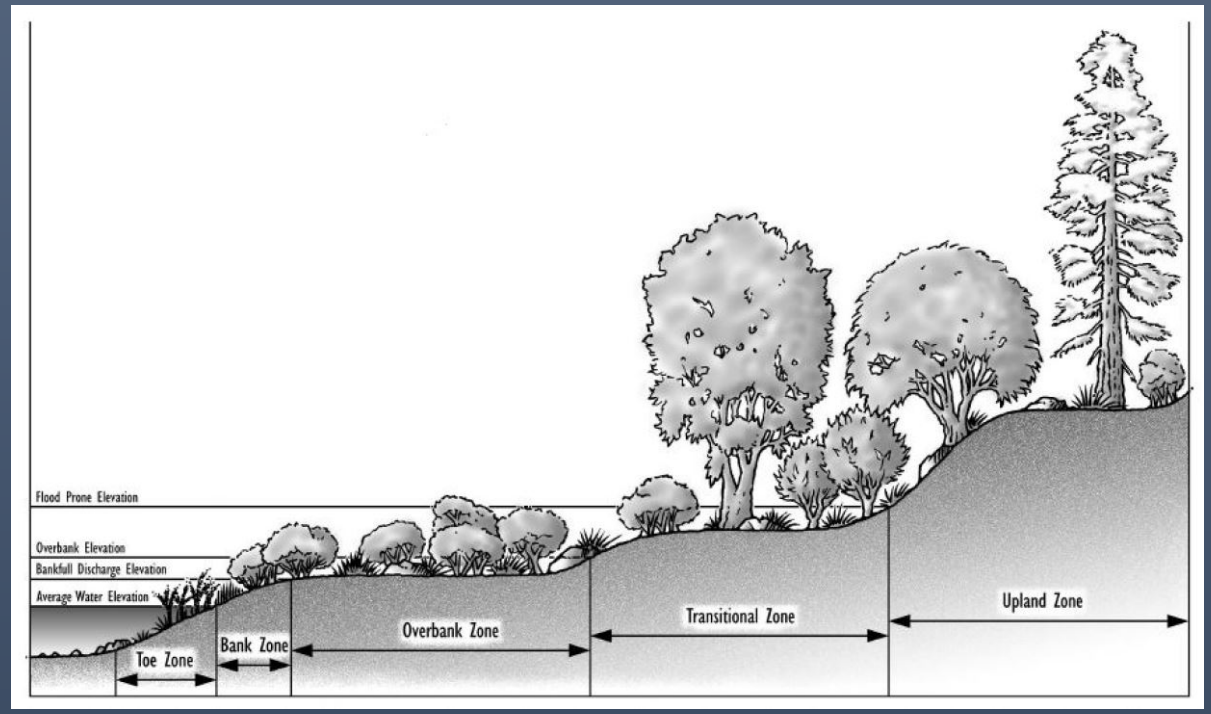
Transition Zone Vegetation

- Zone where larger trees are typically found, e.g. Black cottonwood, quaking aspen, etc.
- Also more drought tolerant plants such as chokecherry, snowberry, blue elderberry, etc.

Chokecherry

Aspen

Upland Zone

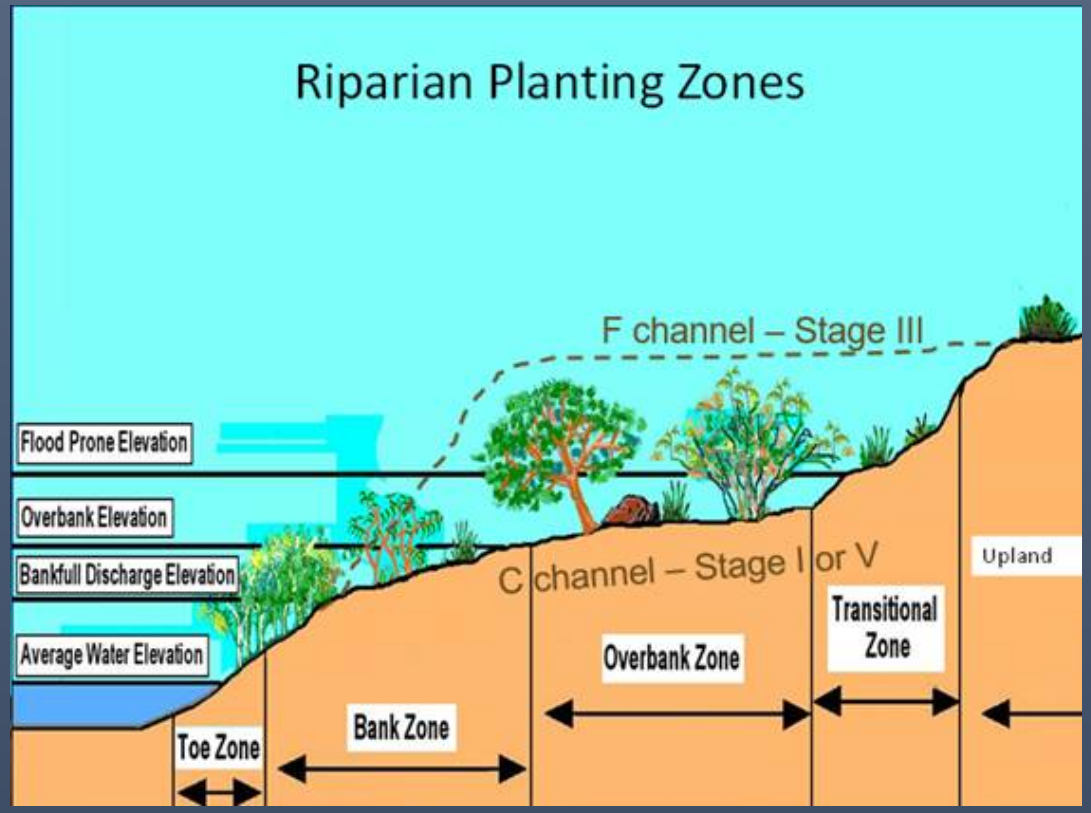


- Area above the flood prone elevation.
- Vegetation is predominantly upland species

Upland Zone Vegetation
- Trees and shrubs that can be expected to thrive without any access to ground water from stream/river.

Ponderosa Pine, woods rose, snowberry, Rocky Mt. juniper, etc.

Very often the majority of trees and shrubs planted in a Riparian Forest Buffer practice are upland species.



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WQQT-West National Technology Support Center
USDA-Natural Resources Conservation Service

Channel Evolution Model

- Determine the physical processes dominating the system (*may need hydrologists, engineers, etc*.)
- Evaluate morphological state of the stream (channel evolution)

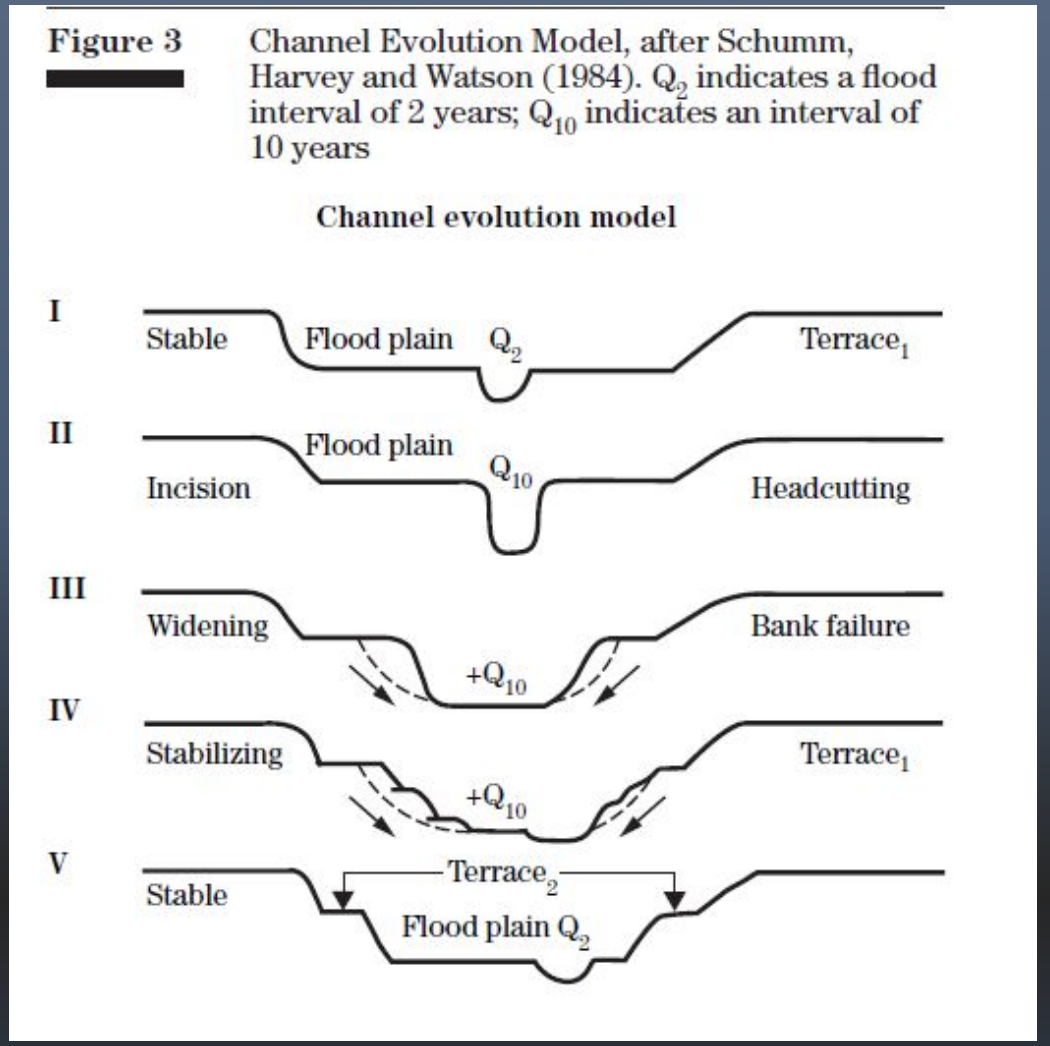
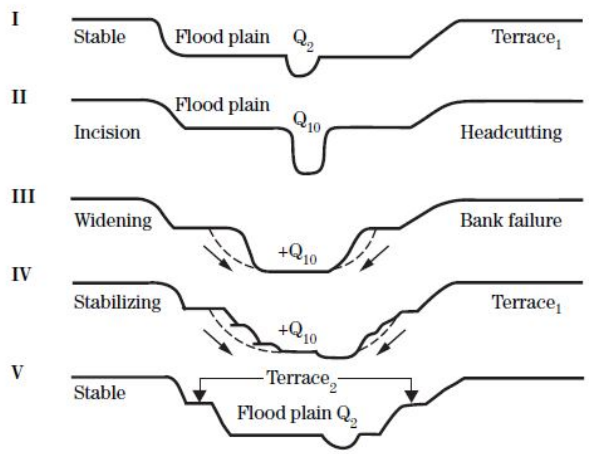
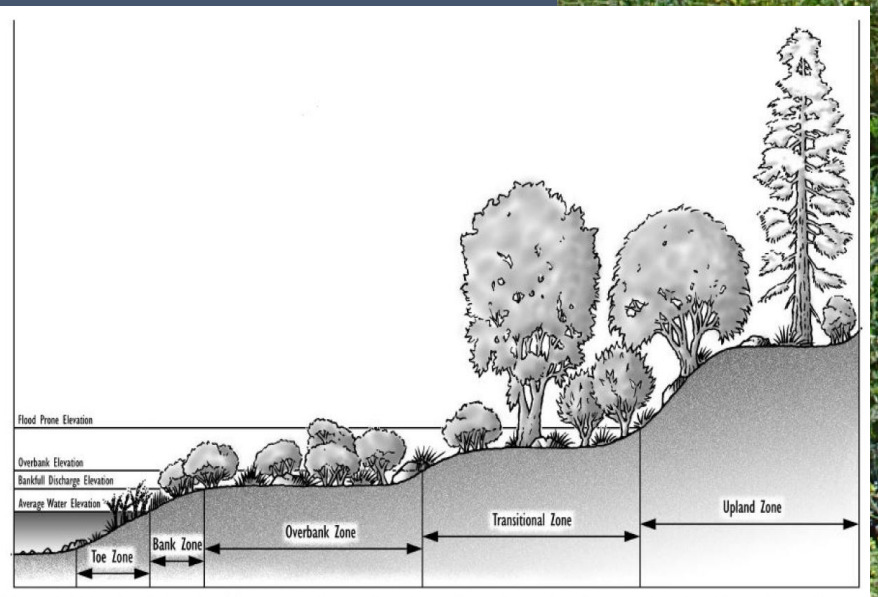


Figure 3 Channel Evolution Model, after Schumm, Harvey and Watson (1984). Q_2 indicates a flood interval of 2 years; Q_{10} indicates an interval of 10 years





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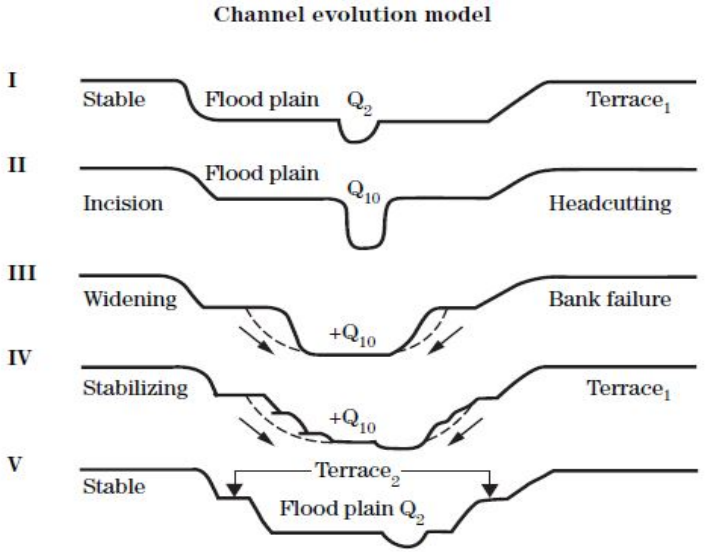

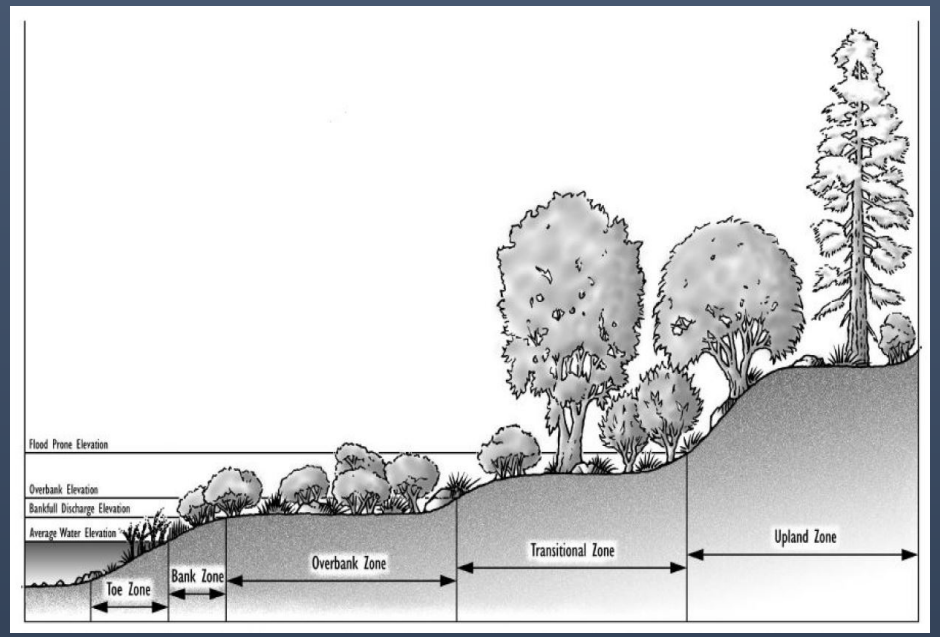

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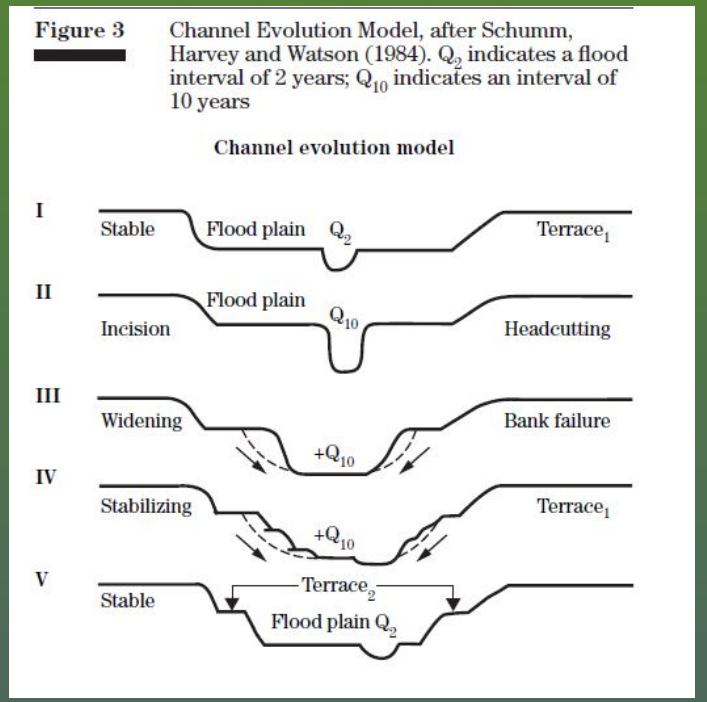

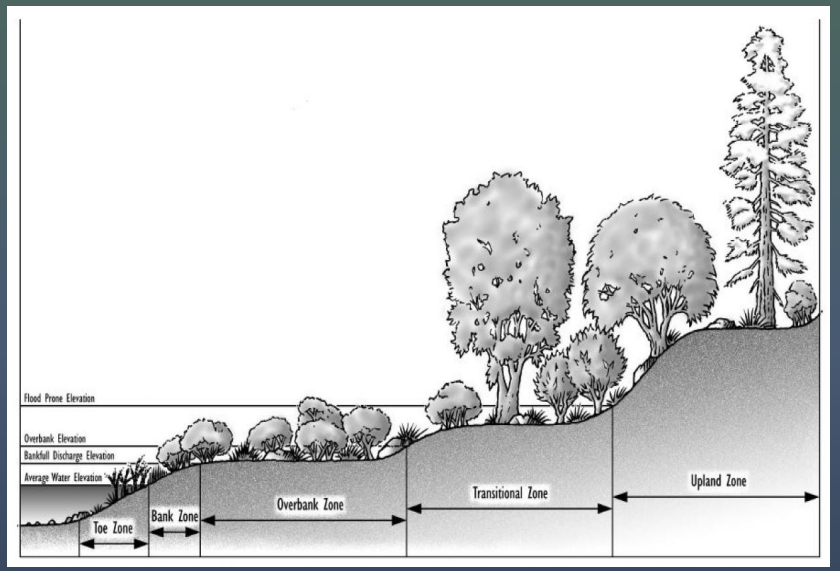

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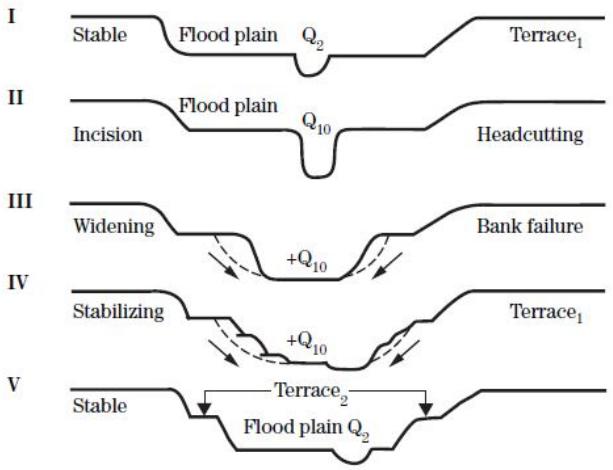

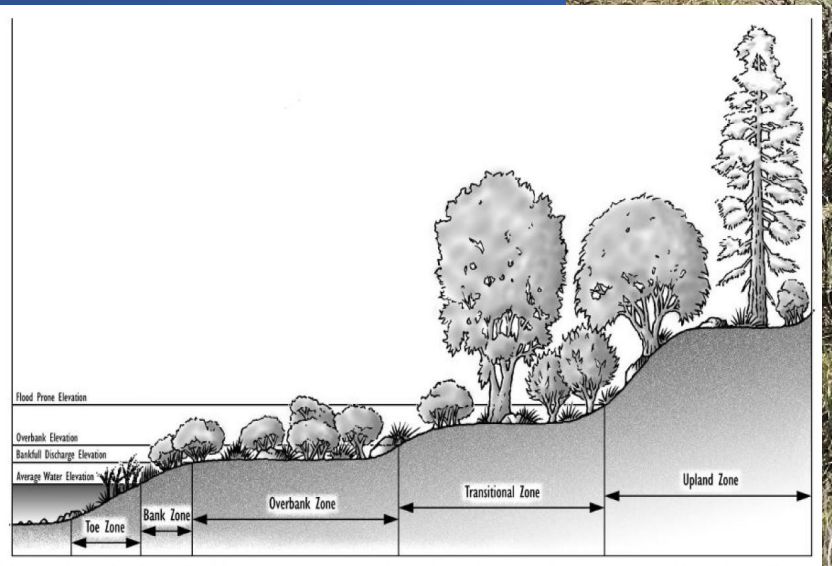

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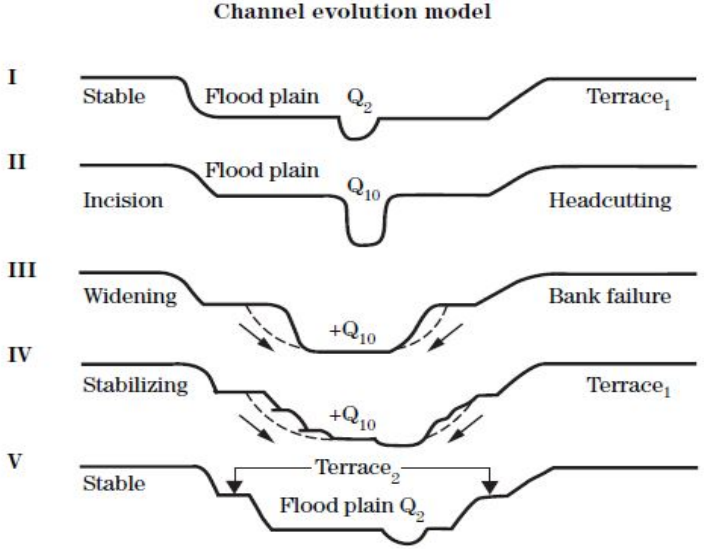
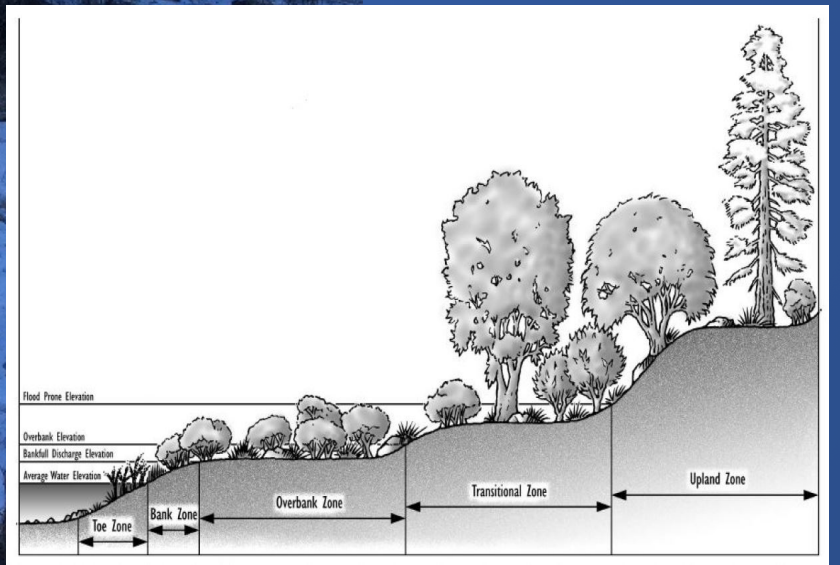




Other Considerations:

- Upland topography
- Weed competition/site preparation
- Grazing
- Pests, Rodents
- Access

United States Department of Agriculture
Natural Resources Conservation Service
Washington

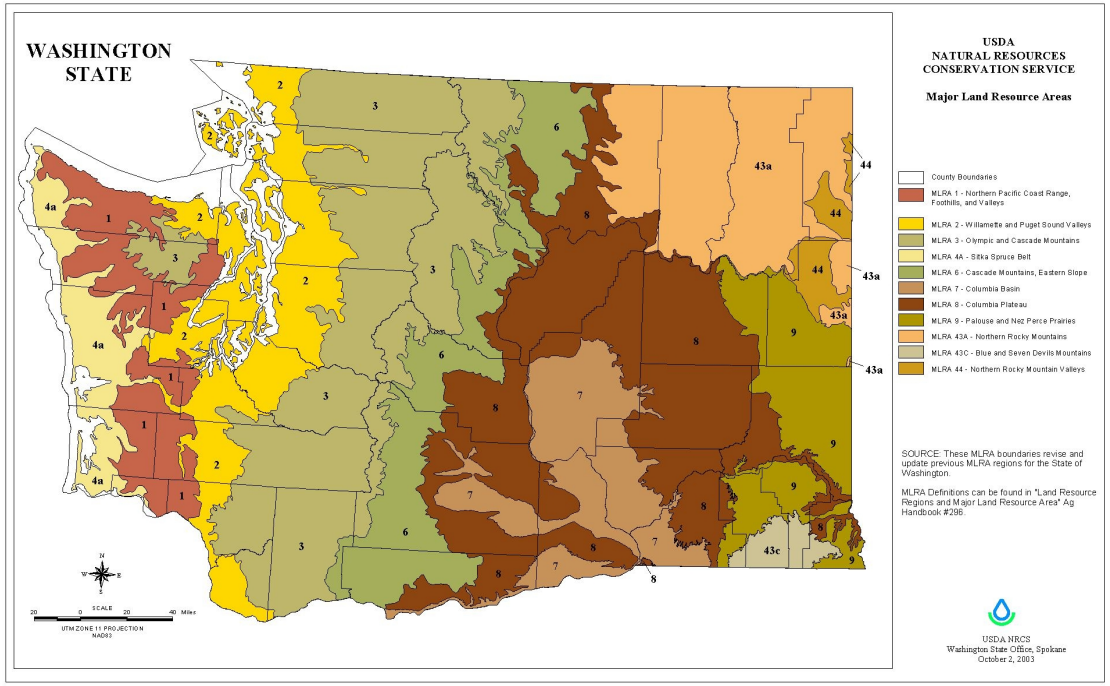
Trees and Shrubs for Riparian Plantings

316 W. Boone Ave., Suite 450, Spokane, WA 99201-2348 | Telephone: 509-323-2900 | Fax: 855-847-5492

The following are lists of riparian trees and shrubs by Major Land Resource Areas (MLRAs) and contain relatively common species available from plant nurseries.

- The original source of plant materials should, if possible, come from the MLRA, ecoregion, or for conifers, the seed zone within which you are working.
- Base the species composition of your planting on a reference community. Reference communities may be found in the watershed or a watershed within the Common Resource Area (CRA). Reference communities should be well-functioning native communities and similar to the planting site in terms of

Major Land Resource Areas (MLRA's)



References

Shrub and Tree Species for Planting Riparian Areas in MLRA 9

Major Land Recource Area 9

					in the water	early seral typically flooded	often hydro-phytic often flooded	mix of species rarely flooded	upland species never flooded	
					Riparian Zones					
Common name	Scientific name	tree = shrub = T/S = short tree/ tall shrub	Minimum Spacing	Height (feet)	Type Zone	Bank Zone	Overbank Zone	Transition Zone	Upland Zone	Notes
redosier dogwood [1,4]	*Cornus sericea ssp. sericea*	S	6	7-10	Herbaceous Zone	x	x	x		
covote willow [3,4,8]	*Salix exigua*	T/S	4	3-15		x	x			cuttings ok
vellow willow [3,4]	*Salix lutea*	T/S	6	↑23		x	x			cuttings ok
Geyer's willow [3,4]	*Salix geyeriana*	T/S	6	10-15		x	x			cuttings ok
thinleaf alder [1]	*Alnus incana ssp. tenuifolia*	T	8	↑40		x	x			nitrogen fixer
water birch [1]	*Betula occidentalis*	T	8	↑50		x	x			
Utah honeysuckle [1]	*Lonicera utahensis*	S	3	5		x	x			
Mackenzie willow [1,3,4]	*Salix prolixa*	T/S	6	↑30			x			cuttings ok
Bebb willow [3,4]	*Salix bebbiana*	T/S	5	10-25			x	x		cuttings ok
peachleaf willow [3,4]	*Salix amygdaloides*	T	8	20-40			upper [2]	x		cuttings ok
golden currant	*Ribes aureum*	S	5	↑10			x	x	x	
Woods' rose	*Rosa woodsii*	S	5	2-6			x	x	x	
bitter cherry [1]	*Prunus emarginata*	T/S	5	↑50			x	x		
black hawthorn [1]	*Crataegus douglasii*	T/S	7	14-35			x	x		has thorns
chokecherry [1]	*Prunus virginiana*	T/S	5	↑25				x		
blue elderberry [1]	*Sambucus nigra ssp. cerulea*	T/S	6	↑25				x		
quaking aspen [1]	*Populus tremuloides*	T	8	30-45				x		
black cottonwood [1,4]	*Populus balsamifera ssp. Trichocarpa*	T	12	↑160				x		large tree

Bank Zone & Overbank Zone Plants

Transition Zone Plants

Shrub and Tree Species for Planting Riparian Areas in MLRA 9

					early seral	often hydro-phytic	mix of species	upland species	
					in the water	typically flooded	often flooded	rarely flooded	never flooded	
Major Land Recource Area 9					**Riparian Zones**					
Common name	**Scientific name**	**T = tree S = shrub T/S = short tree/ tall shrub**	Minimum Spacing	Height (feet)	Toe Zone	Bank Zone	Overbank Zone	Transition Zone	Upland Zone	**Notes**
common snowberry	*Symphoricarpos albus*	S	4	2-5	Herbaceous Zone			x	x	rhizomes
ocean spray [1]	*Holodiscus discolor*	S	8	5-15				x		
wax current	*Ribes cereum*	S	4	2-6				x	x	
Nootka rose [1]	*Rosa nutkana*	S	5	↑9				x		
silver buffaloberry	*Shepherdia argentea*	S	6	6-15				x	x	
ponderosa pine	*Pinus ponderosa*	T	14	↑200				x	x	conifer
Siberian peashrub [6]	*Caragana arborescens*	S	6	↑14					x	non native
Rocky Mt juniper	*Juniperus scopulorum*	T	6	↑50					x	slow growing, conifer
serviceberry	*Amelanchier alnifolia*	T/S	5	↑15					x	
mockorange	*Philadelphus lewisii*	S	5	4-8					x	
Oregon grape	*Mahonia aquifolium*	S	4	↑8					x	
smooth sumac	*Rhus glabra*	S	6	↑12					x	
common lilac [6]	*Syringa vulgaris*	T/S	6	↑14					x	non native

Upland Plants

Plant Selection for Riparian Buffers

- Select plants based on the intended purpose(s) of the buffer
- Select plants suited to the soil and hydrology of the site
- Use tree and shrub species that are native and non-invasive.
- Plant materials from multiple sources can increase genetic diversity
- Use high quality and adapted plant materials
- Favor tree and shrub species that have multiple values (e.g. nutrient uptake, pollinator habitat, etc.)
- Tree and shrub species, which may be alternate host to undesirable pests should be avoided.

Upland Plants

Plant Selection for Riparian Buffers

- The original source of plant materials should, if possible, come from the MLRA, ecoregion, or for conifers, the seed zone within which you are working.

- Base the species composition of your planting on a reference community.

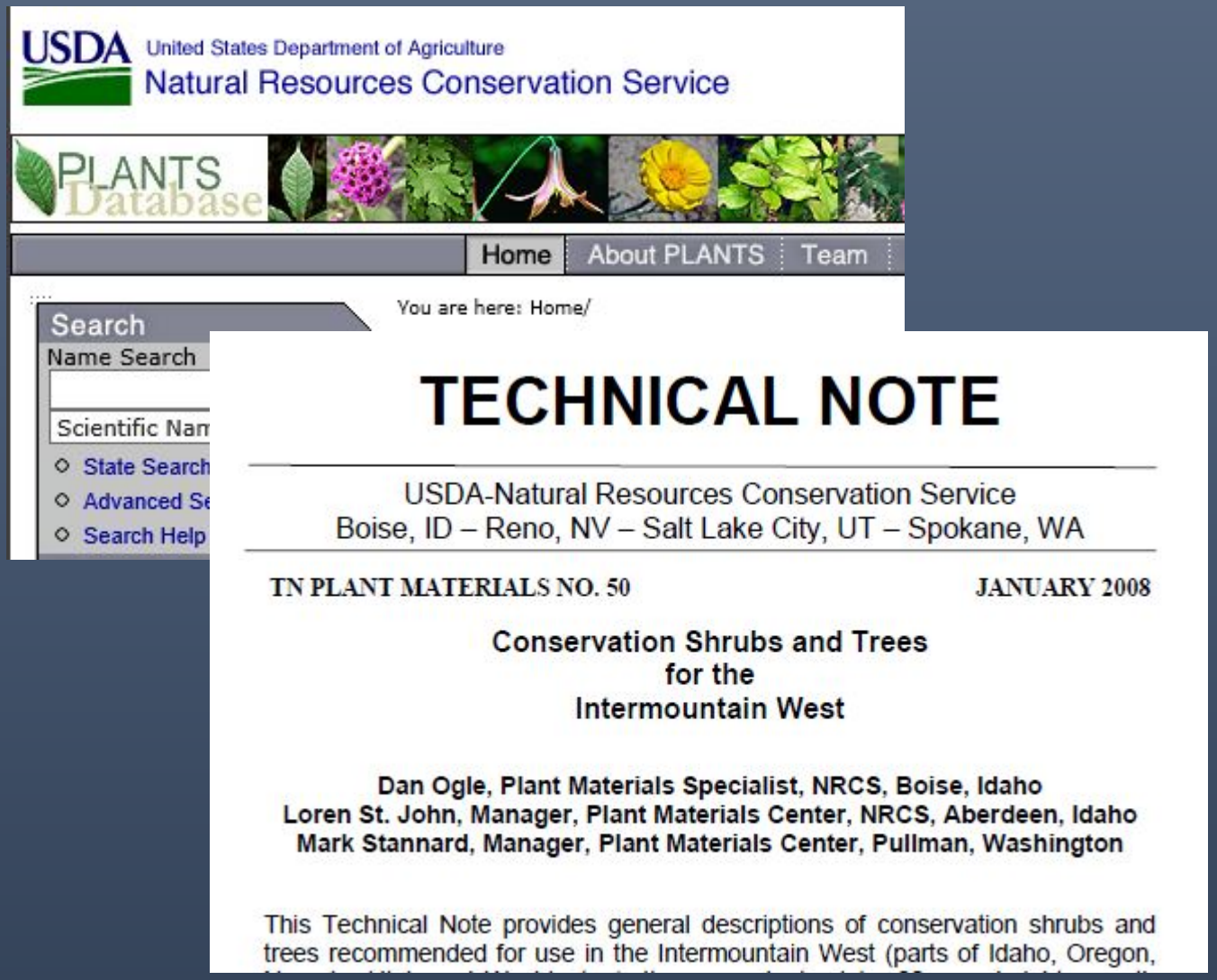
- Plants suited to the Overbank or the Transition Zone may need supplemental water until they develop sufficiently to utilize available ground water.

- The use of mulch for the upland plantings is strongly encouraged.

Plant Selection for Riparian Buffers

- Purpose of the buffer
- Riparian area zones
- Channel evolution
- Quality and appropriate plant materials

References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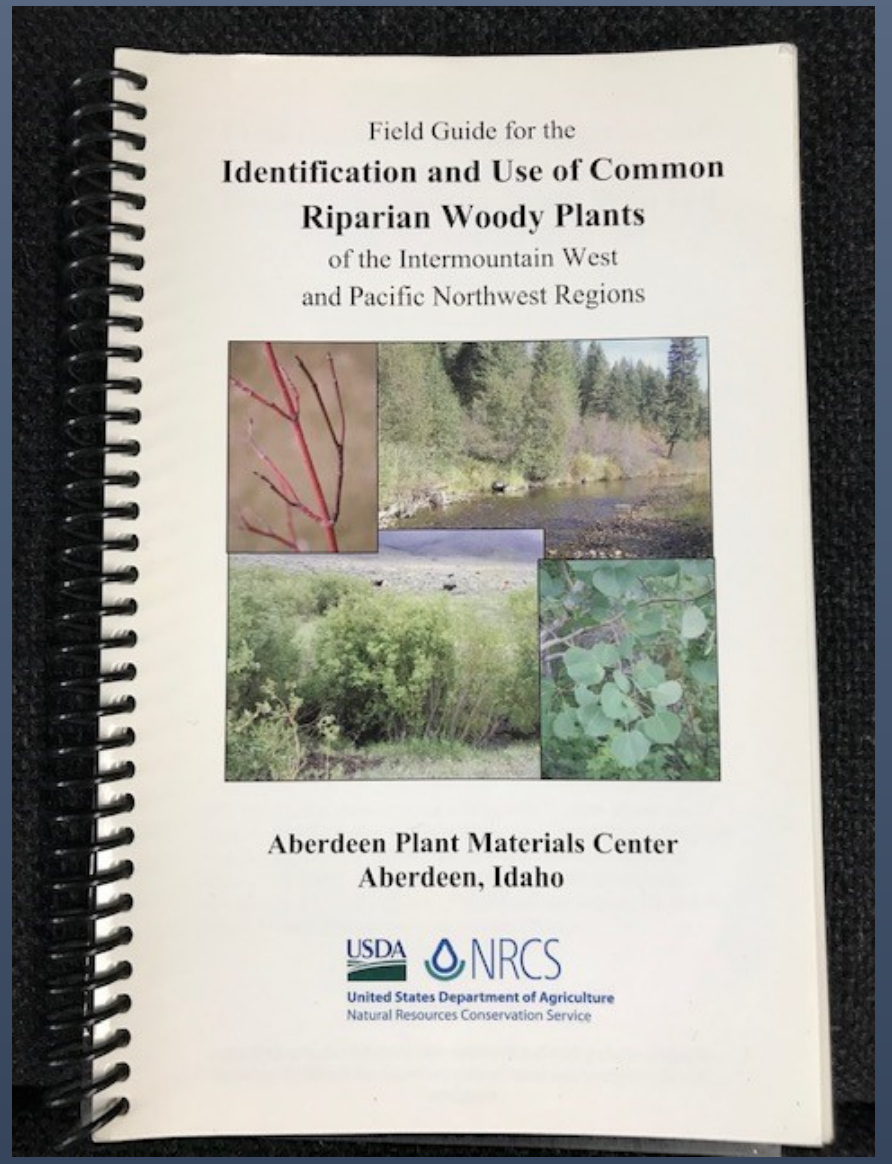
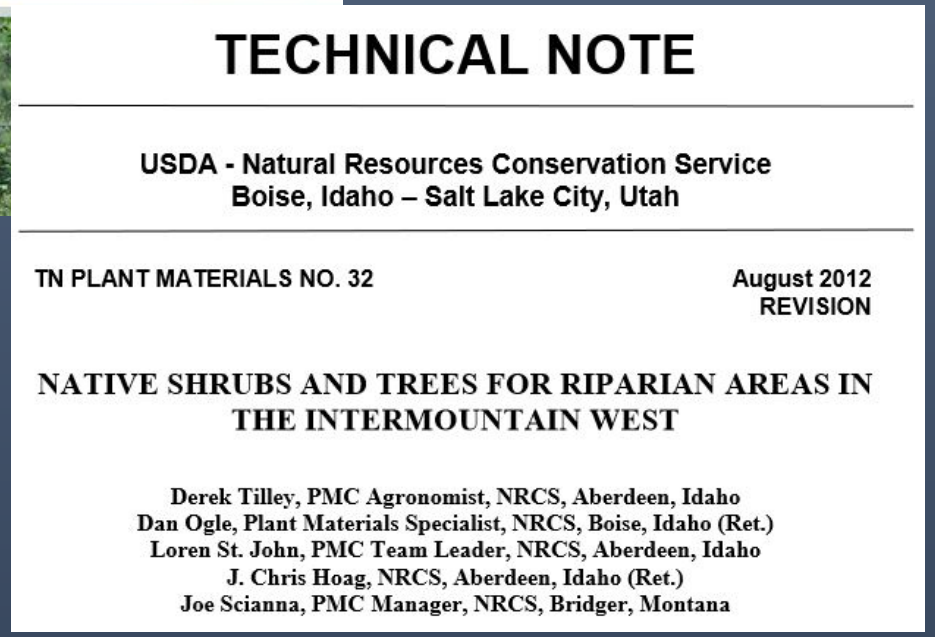
TECHNICAL NOTE
USDA-Natural Resources Conservation Service
Boise, ID – Reno, NV – Salt Lake City, UT – Spokane, WA
TN PLANT MATERIALS NO. 50
JANUARY 2008
Conservation Shrubs and Trees
for the
Intermountain West
Dan Ogle, Plant Materials Specialist, NRCS, Boise, Idaho
Loren St. John, Manager, Plant Materials Center, NRCS, Aberdeen, Idaho
Mark Stannard, Manager, Plant Materials Center, Pullman, Washington
This Technical Note provides general descriptions of conservation shrubs and trees recommended for use in the Intermountain West (parts of Idaho, Oregon,


Field Guide for the
Identification and Use of Common
Riparian Woody Plants
of the Intermountain West
and Pacific Northwest Regions
Aberdeen Plant Materials Center
Aberdeen, Idaho
USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

References

NRCS Plant Materials Program Publications



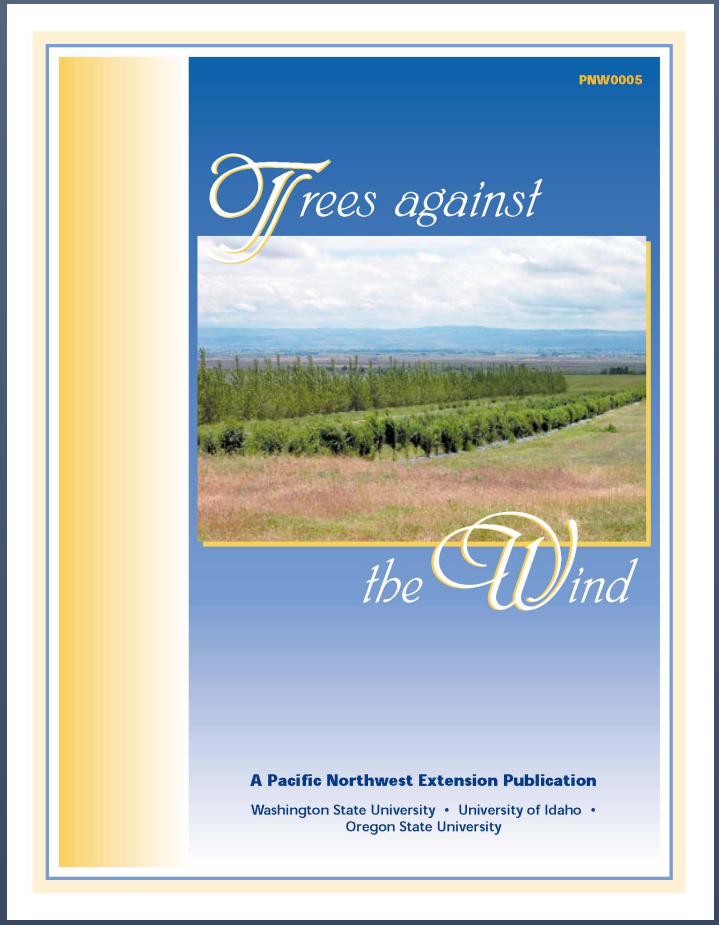
TECHNICAL NOTE

USDA - Natural Resources Conservation Service
Boise, Idaho – Salt Lake City, Utah

TN PLANT MATERIALS NO. 32 August 2012 REVISION

NATIVE SHRUBS AND TREES FOR RIPARIAN AREAS IN THE INTERMOUNTAIN WEST

Derek Tilley, PMC Agronomist, NRCS, Aberdeen, Idaho
Dan Ogle, Plant Materials Specialist, NRCS, Boise, Idaho (Ret.)
Loren St. John, PMC Team Leader, NRCS, Aberdeen, Idaho
J. Chris Hoag, NRCS, Aberdeen, Idaho (Ret.)
Joe Scianna, PMC Manager, NRCS, Bridger, Montana



References

TECHNICAL NOTE

USDA – Natural Resources Conservation Service

Spokane, Washington - Boise, Idaho

ology Technical Note No. 24 Updated November 2

Plants for Pollinators in the Inland Northwest

Pamela Pavek, Agronomist, NRCS Plant Materials Center, Pullman, Washington
Richard Fleenor, Plant Materials Specialist, NRCS, Spokane, Washington
Mark Stannard, Manager, NRCS Plant Materials Center, Pullman, Washington
Tim Dring, State Biologist, NRCS, Spokane, Washington
Jim Cane, Bee Biology and Systematics Lab, ARS, Logan, Utah
Loren St. John, Manager, NRCS Plant Materials Center, Aberdeen, Idaho
Derek Tilley, Agronomist, NRCS Plant Materials Center, Aberdeen, Idaho

Ninebark. Steve Sutherland, Montana Field Guide

Physocarpus malvaceu
Origin: native
Mature Height: 1.5 – 6 ft
Growth Rate: slow
Growth Habit: spreading
Wildlife Value: food, cove
Attracts: bees, butterflies,
Flowers: white
Bloom: June
Precip Range: 18 – 25+ in
In-row Spacing: 6 ft

Chokecherry. Nevada Native Plant Society, PLANTS Database

Prunus virginiana, chok
Origin: native
Mature Height: 10 - 20 ft
Growth Rate: moderate
Growth Habit: oval to rou
Wildlife Value: excellent f
Attracts: bees, butterflies;
two-tailed swallowtail butt
butterfly in the PNW)
Flowers: white
Bloom: May
Precip Range: 12 – 25 in
In-row Spacing: 12 ft

Thank You!

Questions?

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