Columbia Estuary Environmental Education Program

Nelson Creek Project

Hatchery Activities

Cleaning a salmon rearing pond and clipping adipose fins on Coho.

Wood Duck Monitoring

Macroinvertabrates Surveys

Water Quality

Dissolved Oxygen Testing and Chemical Titration Method

Stream Reach Survey

Mosquito Surveillance

Trapping Mosquitos to Test for West Nile Virus

Lewis and Clark Activity

Water Quality Data

	Coordinates	Width (ft)	Avg. Velocity (ft/sec)	Max. Velocity (ft/sec)	Avg. Depth (ft)	CFS (VxA=CFS)
1	46.25081N 123.31770°W	7.87	1.63	2.7	0.25	3.21
2	46.25081N 123.31770°W	12.14	0.29	0.7	0.52	1.83
3	46.25075N 123.31768W	13.12	0.68	1.3	0.53	0.4
4	46.25132N 123.31757W	15.12	0.66	1.6	0.32	3.19
5	46.25156N 123.31733W	12.47	0.75	1.8	0.49	4.58
6	46.25154N 123.31684W	18.25	1.33	2.7	0.33	8.01
7	46.15455N 123.18850W	10.5	0.89	2.1	0.29	2.71
8	46.25132N 123.31745W	7.02	1.38	2.7	0.19	1.84
9	46.25841N 123.31438W	9.22	0.48	0.8	0.41	1.81
10	46.25762N 123.31762W	8.86	0.99	2.5	0.25	2.19
11	46.25898N 123.31814W	9.06	0.48	0.41	0.26	1.14
12	46.25957N 123.31839W	8.86	0.66	1.2	0.45	2.63
13	46.25927N 123.31919W	6.56	1.54	3.1	0.33	3.33
14	46.26059N 123.32144W	15.09	0.37	1	0.53	2.95

Culvert Data

Culvert Number	Coordinates	Upstream	Downstream	Extra Comments
Culvert F1	46°25.154N 123°31.68W	Normal	Perched 12"	Both causing erosion in stream bank
Culvert F2	46°25.154N 123°31.68W	Normal	Perched 4"	Both rusted through
Culvert 1	46°15.613N 123°19.319W	Sunk 8"	Perched 15"	
Culvert 2	46°15.613N 123°19.319W	Sunk 26"	Perched 12"	Upstream is dammed all the way across, and water has to flow through the blockage.
Culvert 3	46°15.739N 123°19.710W	Normal	Perched 6"	

Knotweed Data

	Coordinates	Shade/Sun	% Cover	Stem Density (#/1/4meter)	Size of Population (ft)
1	46.25081N 123.31770°W	**None**	**None**	**None**	**None**
2	46.25081N 123.31770°W	**None**	**None**	**None**	**None**
3	46.25075N 123.31768W	**None**	**None**	**None**	**None**
4	46.25132N 123.31757W	**None**	**None**	**None**	**None**
5	46.25156N 123.31733W	**None**	**None**	**None**	**None**
6	46.25154N 123.31684W	Half	100	8	18x10
7	46.15455N 123.18850W	Sun	100	5	35x10
8	46.25132N 123.31745W	Sun	100	7	6x23
9	46.25841N 123.31438W	3/4 Shade	100	27	6X60
10	46.25762N 123.31762W	Shade	70	7	9x15
11	46.25898N 123.31814W	Shade	70	6	30x8
12	46.25957N 123.31839W	Shade	70	7	9x15
13	46.25927N 123.31919W	Shade	100	3	1x1
14	46.26059N 123.32144W	Shade	100	6	6x15

Fence Building

Stream Flow and Macroinvertatabrates Suveys

Fresh Water Mussels and more Macroinvertbrates

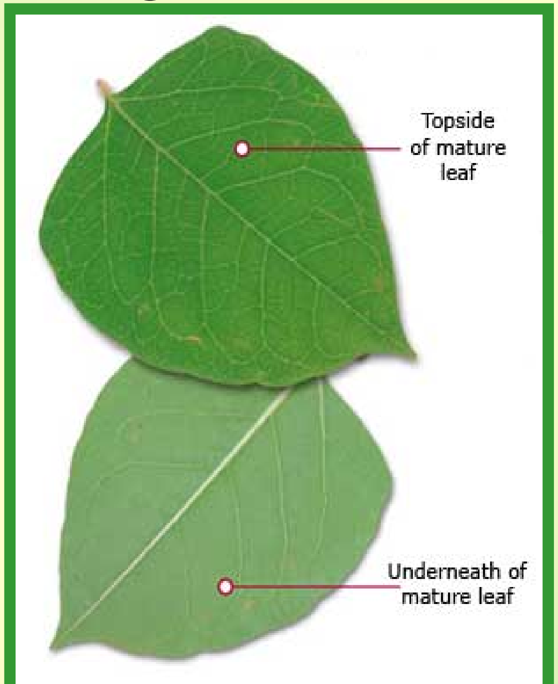
Japanese Knotweed

- Herbaceous Perennial
- Four to eight feet
- Stems round and hollow

* An herbaceous perennial plant is one that dies back to the ground at the end of the growing season.

Leaves

- Deltoid shaped
- Alternate
- Form at nodes
- 10 to 15 cm
- Flattened
- Dark green above and lighter green below.



Flowers

- Greenish-white
- Bloom in clusters
- Bloom at leaf axils
- Between August and September.

Reproduction

Spreads by:

~Rhizomes ~Soil ~Water

Affecting Ecosystems

-Creates a monoculture which prevents native plants from growing.

-When Japanese knotweed starts growing the insects leave because they do not feed on it. This causes a gap in the food chain.

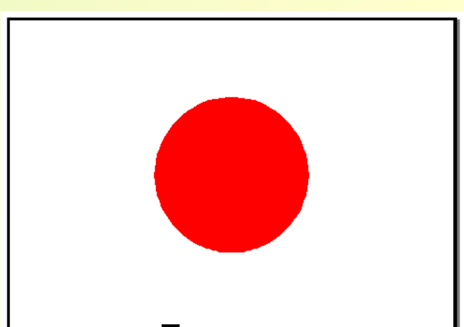
Where did it come from?

Korea

Native in countries in eastern Asia.

It isn't a problem in these countries because Natural predators such as insects and diseases that control the noxious weed naturally.

China



Japan

Bio Control

Lixus Weevil
Lixus Coleopteran

Plant Louse
Aphalara Psyllid

Leaf spot fungus
Pyricularia grisea

Why was it brought to us?

- Used for ornamental purposes.
- The young stems of Japanese Knotweed were used for cooking.

Injection Guns & AquaMaster

We chose AquaMaster because it contains the glyphosate necessary to kill the plant, but does not contain surfactants, which can clog the fish's gills.

You inject by inserting the needle at a 90 degree angle between the first and second or second and third nodes, then you squeeze the trigger all the way which will deliver a measured dose (5 mL) AquaMaster directly into the stem of the plant.

The injection process in riparian areas has been the most effective control method against plant re-growth.

Plants will normally take up the herbicide within 20 minutes of the injection, moving down the plant and killing the rhizomes. After about 3 weeks, the plant will begin to die.

Glyphosate (N-phosphonomethyl glycine)

Glyphosate kills plants by inhibiting enzyme action, which shuts down protein synthesis, and inhibits photosynthesis.

AquaMaster is considered to be less toxic than a number of other herbicides and pesticides. It poses no health risk to humans because it lacks surfactants. Glyphosate is one of the most common chemicals used in herbicides. It is not toxic to humans, but if mixed with a surfactant, it may be harmful if ingested.

Disrupts <u>only</u> the shikimate acid pathway in plants and in effect ceases any and all development within a plant.

Rapidly bonds with soil particles and becomes inactive.

Degraded by bacteria and converted to CO_2.

Half-life is generally 3 days.

How the Herbicide Kills the Plant

The Shikimate Acid Pathway is found in all higher plants. It is the process by which plants produce amino acids that lead to protein production needed for photosynthesis and growth.

Glyphosate replaces one of the essential chemicals in the shikimate acid pathway. Glyphosate attaches to the PEP and disables it, which shuts down the whole system. By doing this, proteins are not created, which are necessary for photosynthesis. So, in turn, the plant dies.

Shikimate-3 phosphate + phosphoenolpyruvate +

(S3P) **(PEP)**

5-enolpyruvylshikimate-3-phosphate synthase
(EPSPS)

↓

5-enolpyruvyl-shikimate-3-phosphate
(ESP)

↓ **dephosphorylated**

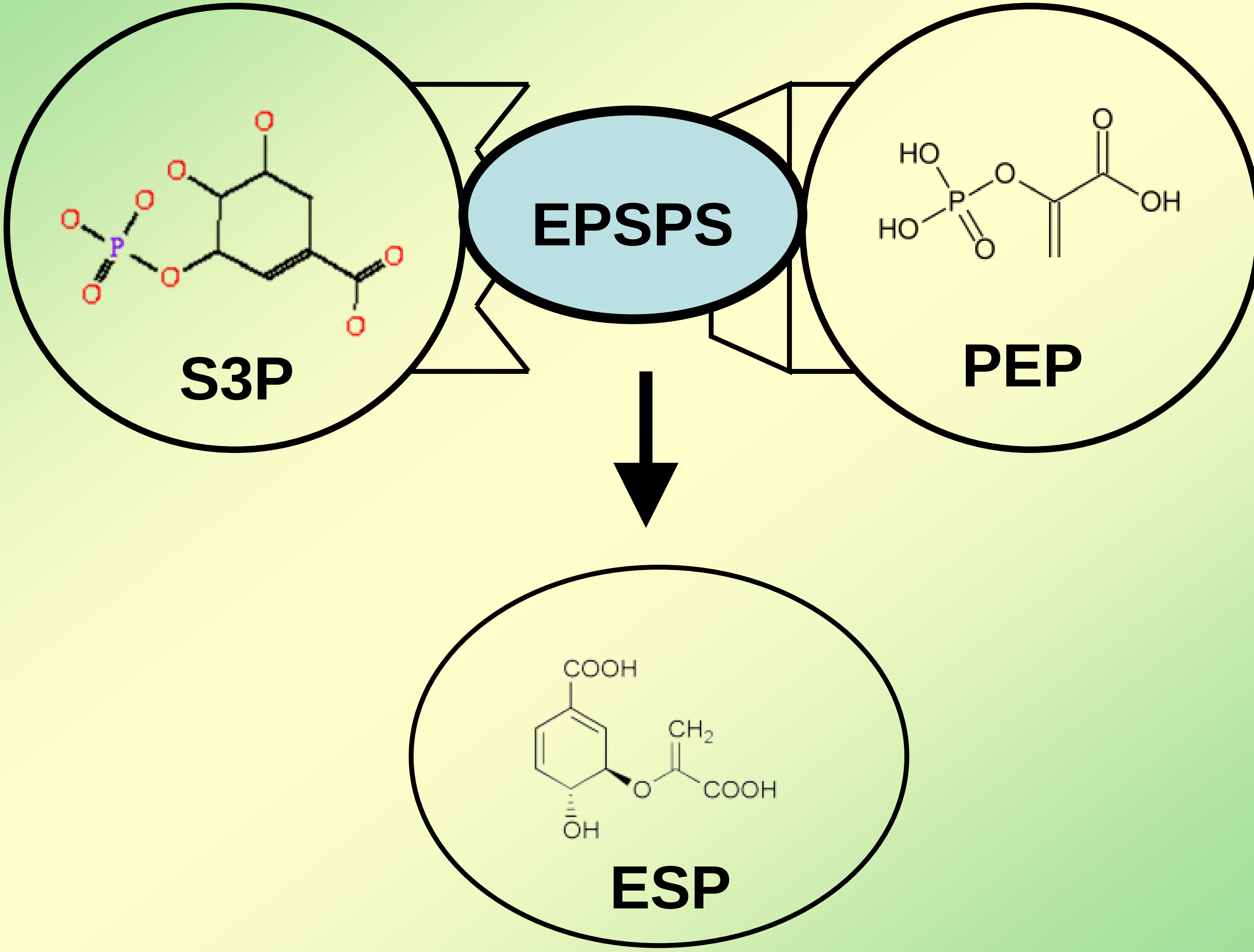
Chorismate

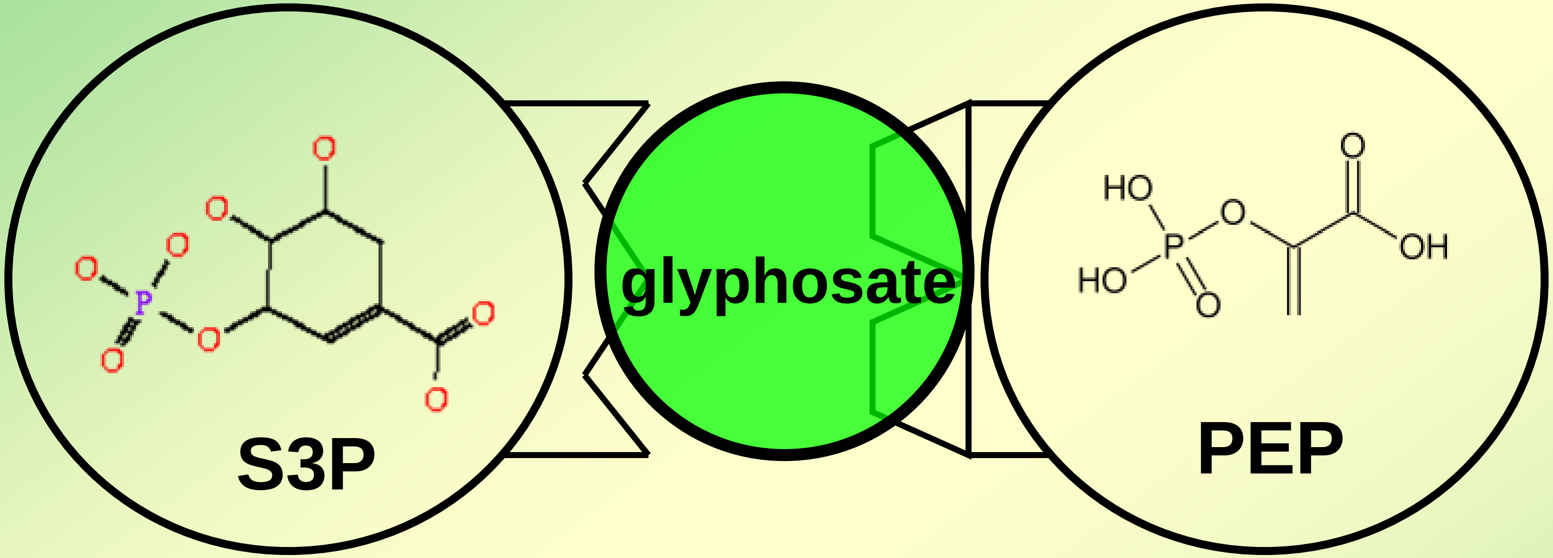
↙ ↓ ↘

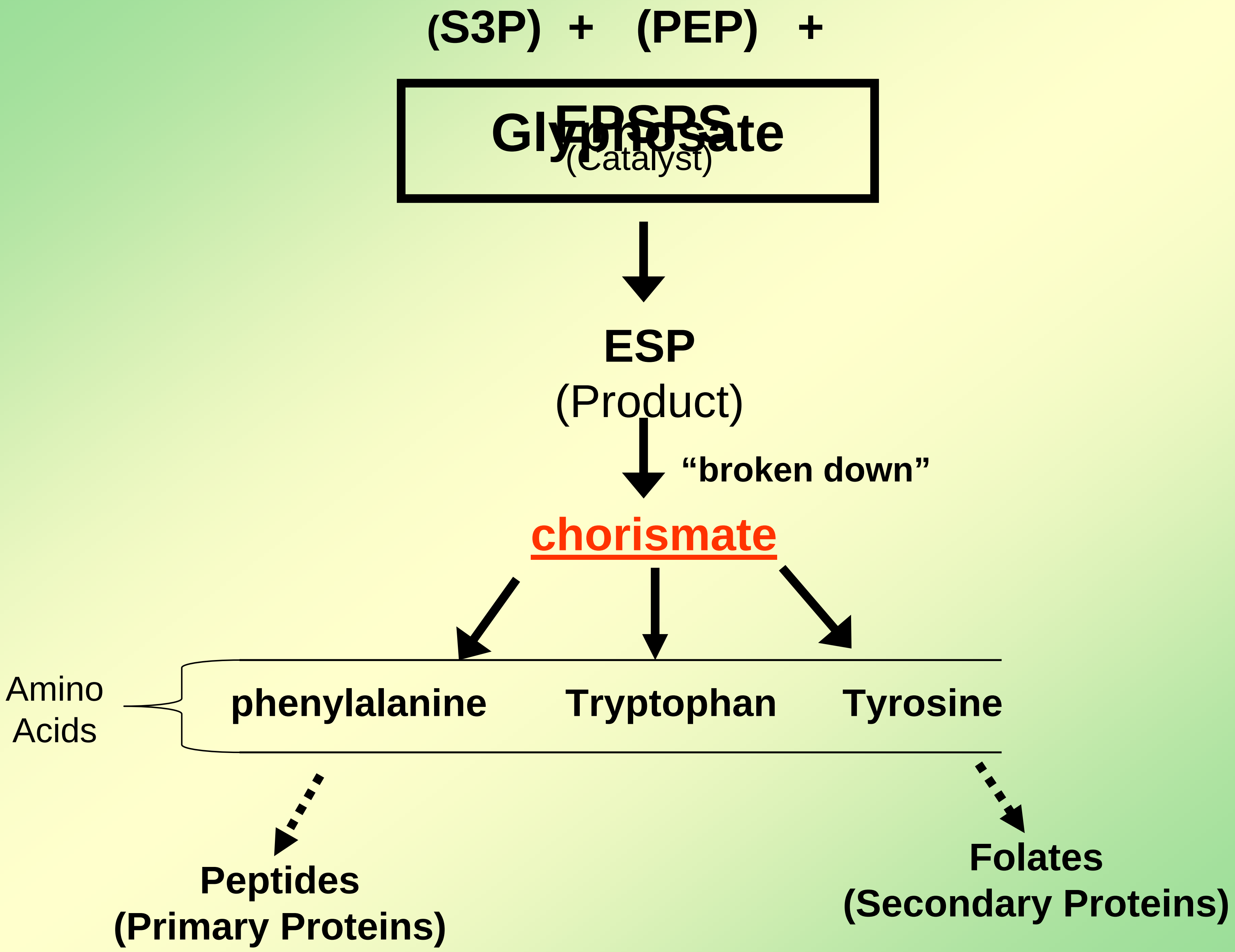
Phenylalanine **Tryptophan** **Tyrosine**

peptides

Metabolites such as Folates


EPSPS
S3P
PEP
ESP
HO
HO
OH
COOH
CH2
COOH
OH


glyphosate
S3P
PEP
HO
HO
O
O
O
OH
P


(S3P) + (PEP) +
Glyphosate
EPSPS
(Catalyst)
ESP
(Product)
"broken down"
chorismate
Amino Acids
phenylalanine
Tryptophan
Tyrosine
Peptides
(Primary Proteins)
Folates
(Secondary Proteins)

Location

- commonly grows in disturbed areas such as

  *volcanic slopes *flooded river banks *roadsides

- frequently found in areas with acidic soils

Results after 3 weeks

Before

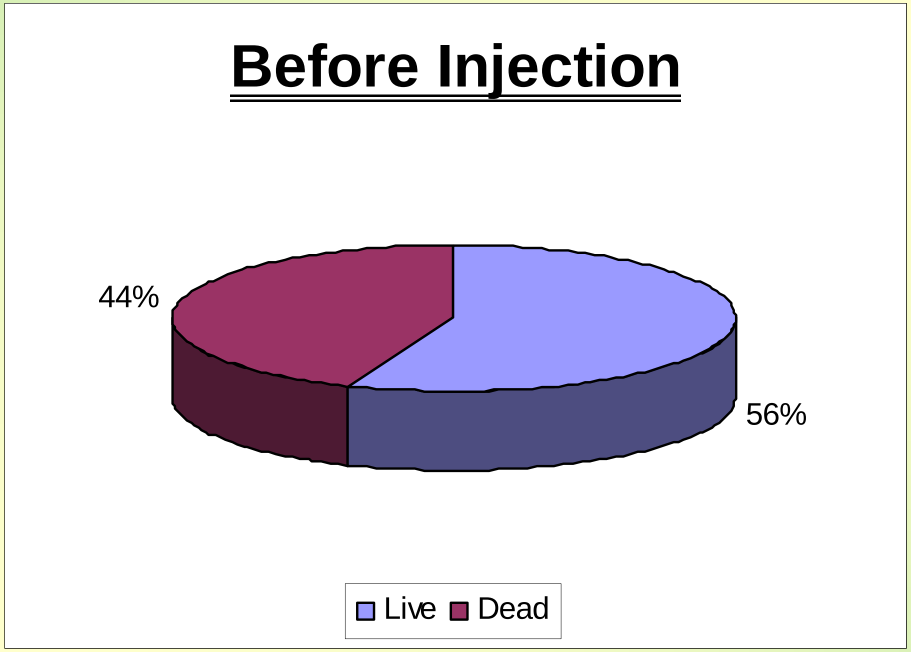
After

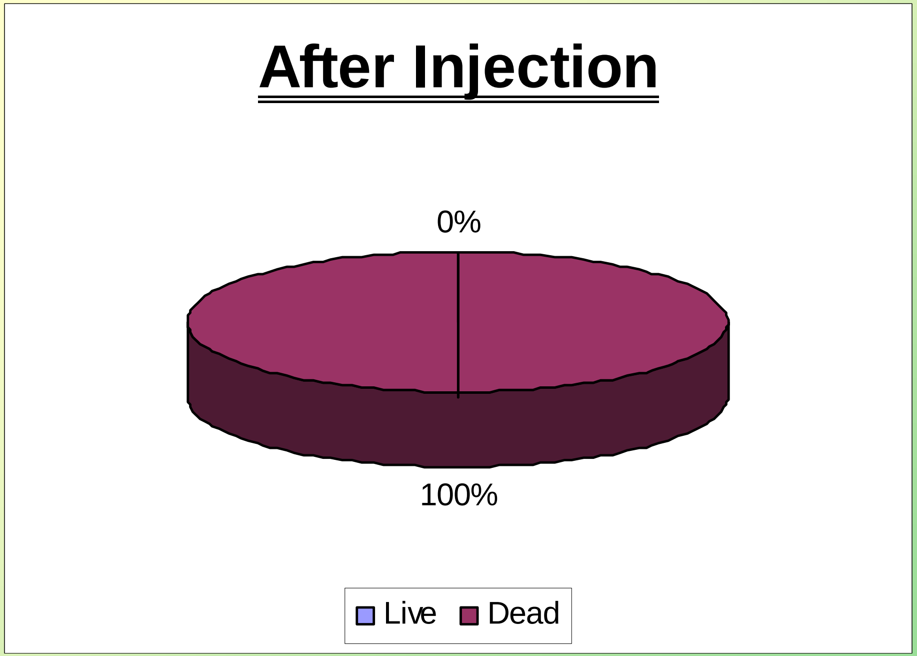

BEFORE


AFTER

Data

We randomly situated three one square meter plots within our study area. We did this to monitor the glyphosate kill rate of this noxious weed. We inventoried all of the live and dead stems before injection, and again three weeks after injection.





Tour with Hancock Forest Management

With David and Wade Boyd, we learned a lot about buffer zones, PIPs (perennial initiation points), and harvesting.

A buffer zone is the area where trees have to be left. It lies around streams, usually about 50 feet off of each side.

A PIP is a the area by a stream where there is water all year round, so the loggers have to leave a cluster of trees around it.

Loggers will harvest tree stands that are about 40 years old.

We witnessed the installation a culvert and observed several clear cuts.

Logging Tour

- **Mark Standley brought us on this tour and we were able to watch the actual logging process and learn about all the important people and equipment**

Choker Setter-
Wraps chokers around ends of logs that need to be hauled into the landing

Chaser -
Releases cabled logs after they are pulled in by the Yarder

Stroker

De-limbs logs, and cuts them to length

-Loads logs onto Log Trucks

- Sorts logs

Loader

Yarder

- Pulls logs from cutting area to landing
- Controls direction, speed, and braking of cable drums

Sky Car

- Used primarily to haul logs that need to be completely suspended in air

Guest Speaker: Allen Whiting

Allen demonstrated to us how to use a flow meter and a staida rod.

Flow Meter

The flow meter is used to measure how fast the stream is flowing. It calculates in feet per second.

The stadia rod was used for stream reach. It would assist us in measuring the volume of water in the creek and the overall carrying capacity.

Thank You!

Hancock Forest Management
David and Wade Boyd
Wahkiakum Community Foundation
Pacific University
Lower Columbia River Estuary Partnership
Jerry Debriae Logging Company
Mark Standley and Lonnie Webb
National Fish and Wildlife Foundation
Columbia Land Trust
JBH Wildlife Refuge
Wahkiakum School District
Naselle/Grays River School District
CREST - Americorps
Workforce Development Council
Bradwood Landing
John Doumit
George Hanigan
US Fish and Wildlife
WA Dept of Fish and Wildlife
Monsanto Chemicals
Pete Ringin - Wahkiakum Public Works Dept