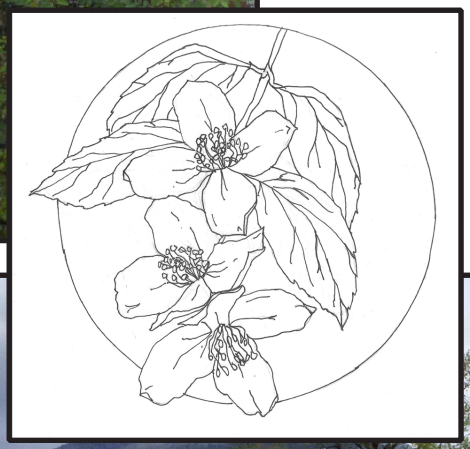
North Cascades National Park

Native Plant Restoration Program

2014 Year End Report

PROGRAM MISSION

PURPOSE and CONTENT



2014 is the first year for a Native Plant Restoration Program year end report. The function of this report, and subsequent annual reports, is to document the accomplishments of the program, report progress on individual restoration projects, summarize the data collected throughout the season, and lay out plans for the upcoming seasons.

Creation of an annual report in a standardized form will help to provide continuity of program management and provide a tool for restoration program staff, management and partners.

The report includes:

- Status of all ongoing Restoration Projects
- Summary of Completed projects
- Highlights of Nursery/Greenhouse Projects and Special Projects
- Funding and Expenditures
- Summary of Nursery Activities
- Volunteer and Youth Involvement Summary

Restoration Program Highlights

Projects

- Completed Projects at Environmental Learning Center/Sourdough Parking Lot, NOCA West Entrance, NOCA East Entrance and Gorge Parking Lot.
- Completed Contract work for Tulalip Tribe- Harlan Meadows Restoration.
- Began propagation of subalpine plants for Maple Pass and Sahale Arm Trail Reroute.
- Completed propagation of plants for camps at North Fork and South Fork of Bridge Creek, planting to be completed fall 2015.
- Provided remaining plants from 2009/2010 Lorenzen Creek Student Propagation Project for installation at riparian site in Mt. Vernon by Skagit Fisheries Enhancement Group.

Funding and Expenditures

- Total Expenditures for 2014: $113,000
- Grants and Funding Request – Received grant from Washington's National Park Fund and the Snoqualmie Tribe to support Native American Interns in 2014-2015. Completed funding requests through PLC and YCC to support Program Interns and Youth Conservation Corps members through 2018.
- Completed Memorandum of Agreement with Seattle City Light to fund plant production for SCL Projects on NPS and SCL lands
- Finalized Interagency Agreement with Okanagan-Wenatchee National Forest to fund production of subalpine plants for restoration at Maple Pass

Youth and Volunteer Programs

- Volunteers Logged 1,885 Hours
- Student Conservation Association – Continued work with SCA with support of a 6-month intern.
- Youth Conservation Corps - Employed 4 crew members and 1 crew lead for 8 weeks.
- Northwest Indian College – Hosted 2 student interns and started development of internship program guidelines.
- Youth Programs – Continued work with North Cascades Institute, Concrete Summer Learning Adventure Program and College Living Experience.

Restoration Program Highlights

Nursery Program Managment Accomplishments

- Implemented standard data forms for all program data. This will facilitate the creation of a database for data management and reporting.
- Built template for restoration project planning, status and completion reports.
- Completed Planning, Status or Completion Reports for all outstanding projects.
- Installed ArcMap GIS software and purchased a GPS to collect data on restoration projects to create project maps and track area of restoration projects.
- Created SCA, YCC, and NPS Crew check lists and guidelines to manage program requirements.
- Designed and began construction of two new capillary bed watering systems using year-end funds.
- Designed and built mist propagation bed to increase capacity for propagation of vegetative cuttings.
- Installed seed increaser bed to facilitate collection of large amounts of grass seed for SCL and NPS projects.
- Engaged over 50 volunteers, including 38 youths volunteers, who contributed 1,885 hours.
- Assisted Botanist in completion of Hazard Tree Surveys
- Completed Vegetation Surveys for Stehekin – Head of Lake Restoration Project.
- Worked with Botanist to facilitate job share position with a crew member working on Restoration Program and Subalpine Monitoring.
- Completed grant writing and team building workshops, attended Adobe InDesign training and participated in a cultural fluency seminar through receipt of Albright Wirth Grant.

North Cascades National Park
Native Plant Restoration Program
2014 YE Report

2014 Plant Production

7,431 Plants were successfully propagated in 2014 including 24 species of plants for six project sites.

On average each flat of seed sown in 2014 produced 54 plants which is an increase from 2013's average seedling density of 30 plants per flat. Most propagation goals were met. Some species - such as Acer circinatum recieved additional stratification in 2014 which should increase germination success. Other more difficult to germinate shrubby species will be grown from cuttings in subsequent seasons. Seed with low/no germination success was culled from the inventory and will be replaced as needed on a project specific basis.

Transplanting survival for seedlings averaged 77% and many species had survival rates over 90%. Seedlings of red flowering currant suffered high mortality but extra plants were transplanted to offset losses. Foam flower and ceanothus also had low survival rates.

Plant Production and Average Seedling Density

Year	Average Number of Plants per flat sown	Number of Plants Produced
2013	30	8,689
2014	54	7,431
2015*	-	20,165

*target number of plants

Average Transplanting Survival by Species

TREES		
Pseudotsuga menziesii	Douglas Fir	81.5%
Pinus contorta	Lodgepole Pine	78.7%
SHRUBS		
Acer circinatum	Vine Maple	100.0%
Amelanchier alnifolia	Serviceberry	100.0%
Arctostaphyllus uva-ursi	Kinnickinnick	100.0%
Berberis aquifolium	Tall Oregon Grape	100.0%
Paxistima myrsinities	Mountain Boxwood	100.0%
Sorbus scouleriana	Mountain Ash	100.0%
Spiraea betulifolia	Birch-leaved Spirea	100.0%
Spiraea douglasii	Hardhack	100.0%
Vaccinium membraneceum	Black Huckleberry	99.3%
Gaultheria shallon	Salal	97.3%
Rubus sp	Rubus	83.3%
Sherperdia canadensis	Buffaloberry	80.0%
Penstemon davidsonii	Shrubbly Penstemon	76.9%
Linnea borealis	Twin Flower	71.7%
Ribes sanquineum	Red Flowering Currant	69.3%
Ceanothus velutinus	Snowbrush Ceanothus	25.0%
HERBACEOUS		
Geum macrophyllum	Large Leaved Avens	100.0%
Achillea millefolium	Yarrow	99.7%
Anaphalis margaretacea	Pearly Everlasting	94.1%
Penstemon sp.	Penstemon	90.9%
Tiarella triafoliata	Foam Flower	46.0%
GRASSES		
Elymus glaucus	Blue Wild Rye	99.4%
SUBALPINE		
Leutkea pectinata	Partridgefoot	99.3%
Vaccinium deliciosum	Subalpine Huckleberry	98.9%
Potentilla flabellifolia	Fan-leaf Cinquefoil	75.0%

2014 Number of Plants Producted by Project Site

Project	*Species*	Common name	Total Plants Produced
Ross Haul Road	*Acer circinatum*	Vine Maple	54
Ross Haul Road	*Achillea millefolium*	Yarrow	389
Ross Haul Road	*Anaphalis*	Pearly Everlasting	304
Ross Haul Road	*Berberis aquifolium*	Tall Oregon Grape	5
Ross Haul Road	*Elymus glaucus*	Blue Wild Rye	778
Ross Haul Road	*Gaultheria shallon*	Salal	450
Ross Haul Road	*Penstemon*	Shrubbly	52
Ross Haul Road	*Penstemon sp.*	Penstemon	351
Ross Haul Road	*Pinus contorta*	Lodgepole Pine	94
Ross Haul Road	*Pseudotsuga*	Douglas Fir	65
Ross Haul Road	*Ribes sanquineum*	Red Flowering	857
Ross Haul Road	*Rubus sp*	Rubus	36
Reflector Bar	*Acer circinatum*	Vine Maple	20
Stehekin	*Spiraea betulifolia*	Birch-leaved Spirea	260
South Fork Bridge Creek	*Vaccinium*	Black Huckleberry	29
South Fork Bridge Creek	*Elymus glaucus*	Blue Wild Rye	458
South Fork Bridge Creek	*Amelanchier alnifolia*	Serviceberry	147
South Fork Bridge Creek	*Spiraea douglasii*	Hardhack	210
South Fork Bridge Creek	*Geum macrophyllum*	Large Leaved Avens	231
South Fork Bridge Creek	*Tiarella triafoliata*	Foam Flower	150
South Fork Bridge Creek	*Sorbus scouleriana*	Mountain Ash	2
North Fork Bridge Creek	*Ceanothus velutinus*	Snowbrush	4
North Fork Bridge Creek	*Amelanchier alnifolia*	Serviceberry	48
North Fork Bridge Creek	*Spiraea betulifolia*	Birch-leaved Spirea	858
North Fork Bridge Creek	*Vaccinium*	Black Huckleberry	390
Maple Pass	*Sorbus sitchensis*	Mountain Ash	45
Maple Pass	*Vaccinium*	Subalpine	818
Maple Pass	*Leutkea pectinata*	Partridgefoot	294
Maple Pass	*Potentilla flabellifolia*	Fan-leaf Cinquefoil	32
Totals			7431

2014 Propagule Collection

In 2014 staff, volunteers and youth groups collected and cleaned:

71.4 ounces of seed including

48 plant species for

11 project sites.

All seed was collected from within one mile of its project site to ensure the genetic integrity of plant populations is maintained and to provide plants the best chance of surviving after installation on site.

Year	Oncses of Seed Collected	Ounces of Seed Sown	Number of Plants Produced*
2013	24.0	10.0	7,431
2014	71.4	28.0	20,165

* 2014 target number of plants

Ounces of Seed Collected by Plant Type

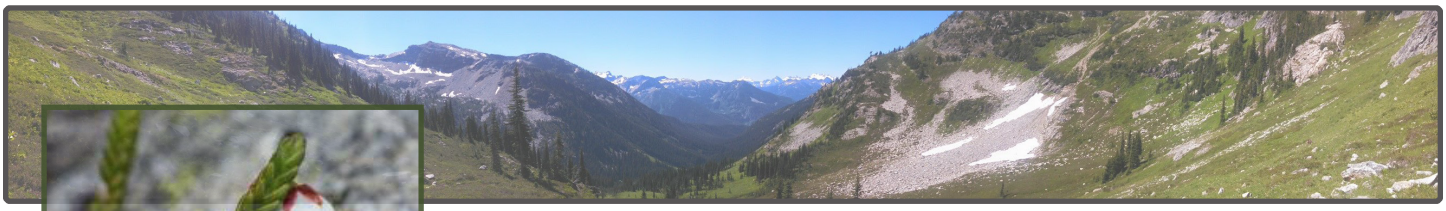
Plant Type	Ounces
Trees	10.65
Shrubs	15.95
Forbs and Grasses	9.56
Subalpine Plants	8.41
Wetland Species	26.85
Total	**71.42**

Ounces of Seed Collected by Project Site

Project Site	Ounces
Cascade Pass	*5.7*
Cat Island	0.2
Devil's Creek	0.2
Dry Creek	21.4
Juanita Camp	1.1
Lodgepole	1.0
Maple Pass	4.1
Ross Haul road	9.4
Seattle City Light - Diablo	8.2
Stehekin	5.1
Stehekin - Head of Lake	15.1
Total	**71.4**

North Cascades National Park
Native Plant Restoration Program
2014 YE Report

2014 Propagule Collection



Our target succes rate for cuttings was 60%. The actual success rate, which only includes softwood cuttings was 35%. 3,940 hardwood cuttings have been stuck and will root in the Spring of 2015. Once the cuttings are rooted the overall success rate can be established.

The achieved results were satifactory as this is the first season using the newly installed mist system and the first time softwood/semihard wood cuttings were collected.

9069 Hardwood and Softwod Cuttings were collected in 2014 including

16 collections and

7 species for two project sites.

Survival for 2012 Cuttings - Transplanted Spring 2013

Project	Species	Common name	# Transplanted	Plants in Inventory YE 2014	Survival Rate
Maple Pass	*Phylodoce empetriformis*	Pink Mountain Heather	40	21	53%
Maple Pass	*Cassiope mertensiana*	White Mountain Heather	62	52	84%

does not included cutting transplanted in 2014

HARDWOOD CUTTINGS COLLECTED 2014

Project	Species	Common name	Propagation Goal	Number of cuttings stuck	
Maple Pass	***Phylodoce empetriformis***	Pink Mountain Heather	**2600**	2991	cuttings to be rooted in spring 2015
Maple Pass	***Cassiope mertensiana***	White Mountain Heather	**900**	969	

CUTTING SUCCESS - Softwood and layering (collected 2014)

Project	Species	Common name	Propagation Goal	Number of cuttings stuck	# Plants transplanted	% Succes	
Ross Haul Road	***Shepardia canadensis***	Buffalo Bush	**50**	50	8	16%	Collected too early in season
Ross Haul Road	***Paxistima myrsinites***	Mountain Boxwood	**100**	100	97	97%	
Ross Haul Road	***Arctostaphylus uva-ursi***	Kinnickinnick	**200**	200	42	21%	
Ross Haul Road	***Linnea borealis***	Twin Flower	**50**	50	60	120%	
Maple Pass	***Phylodoce empetriformis***	Pink Mountain Heather	**3000**	2442	393	16%	Increased success shown with hardwood cuttings
Maple Pass	***Cassiope mertensiana***	White Mountain Heather	**3000**	2197	1184	54%	
Maple Pass	***Leutkea pectinata***	Partridgefoot	**70**	70	27	39%	experimental
			6470	**5109**	**1811**	**35%**	

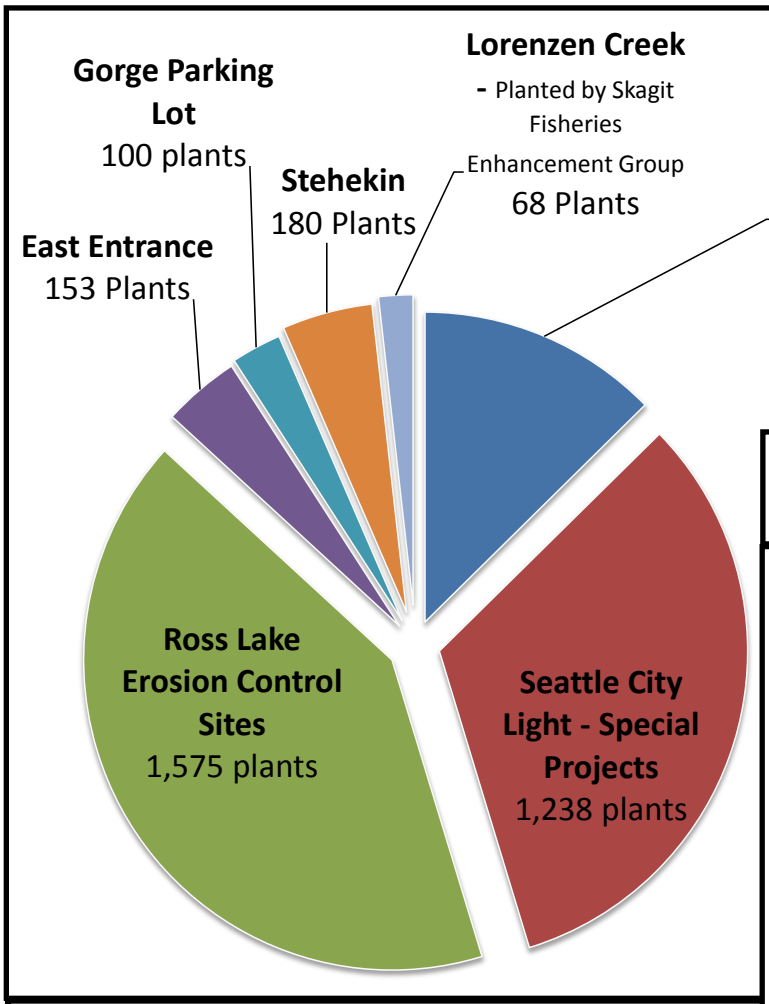
2014 Plant Installations

3,794 Plants (12% of the nursery inventory) were installed at 7 projects sites. Of the seven sites, 5 were in the Ross Lake National Recreation Area, 1 was in the Lake Chelan National Recreation Area and 1 was completed outside of the park boundary.

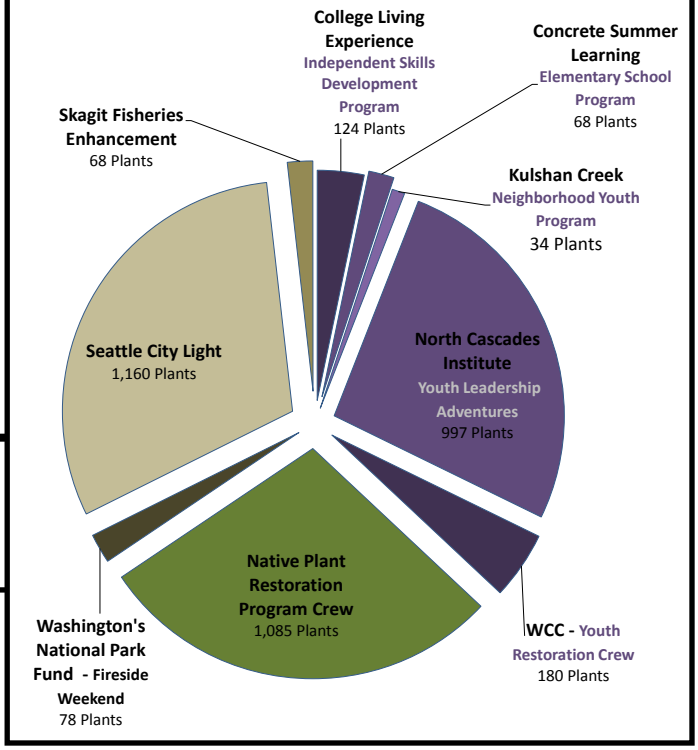
No plantings were completed in 2014 in designated wilderness.

1400 Plants (37%) were installed by Youth and Volunteer Crews in conjuction with our partners at North Cascades Institute, Washington Conservation Corps, Concrete Elementary School, College Living Experience and Kulshan Creek Neighborhood Youth Program

Plant Installation by Project Site



Plant Installation Work Group

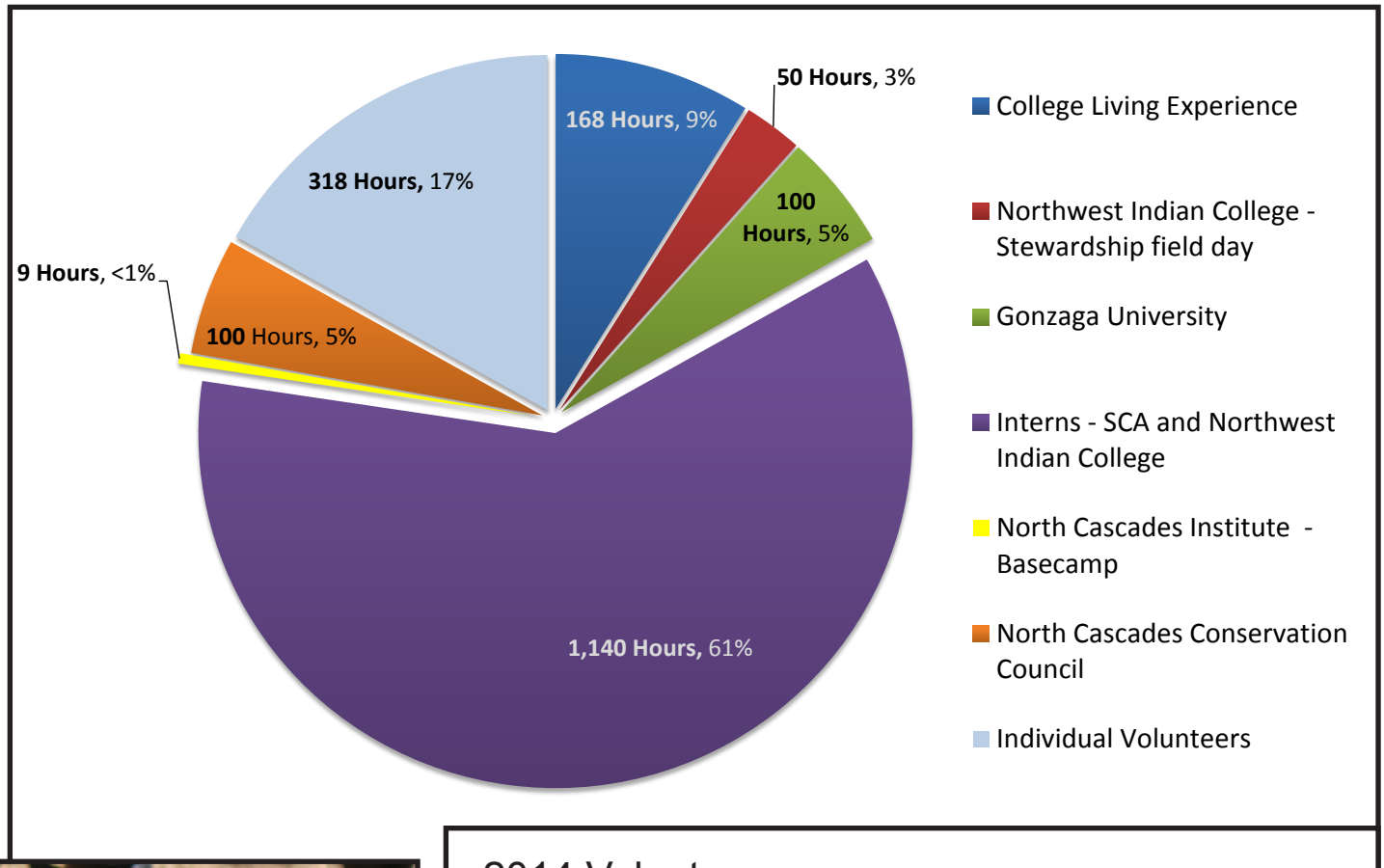


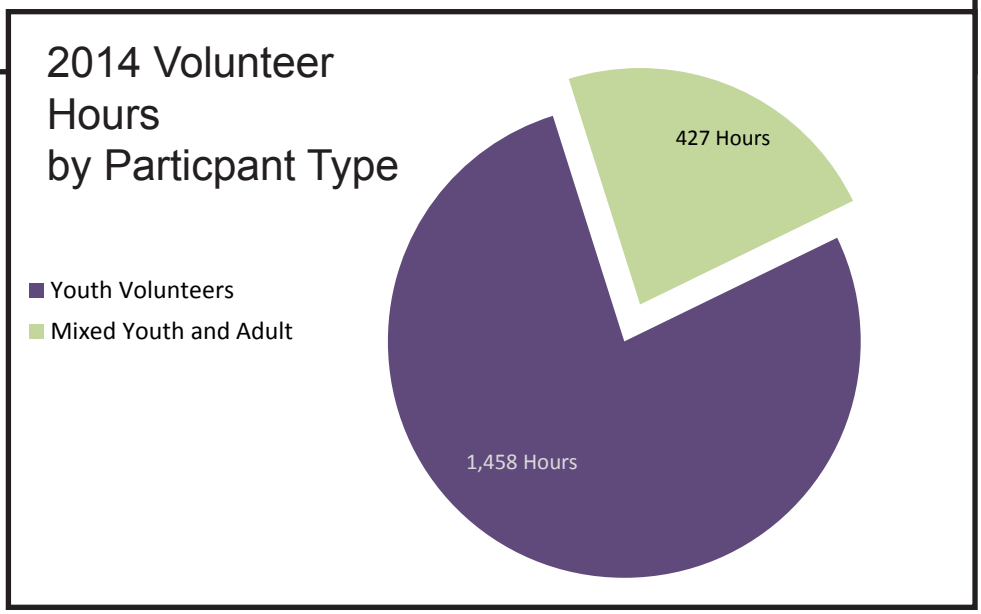
2014 Volunteers

In 2014 the NOCA Restoration Program introduced over 50 volunteers to native plants.

Our volunteers contributed 1,885 volunteer hours throughout the course of the season.

Of these volunteers over 75% were Youth Volunteers and Interns.



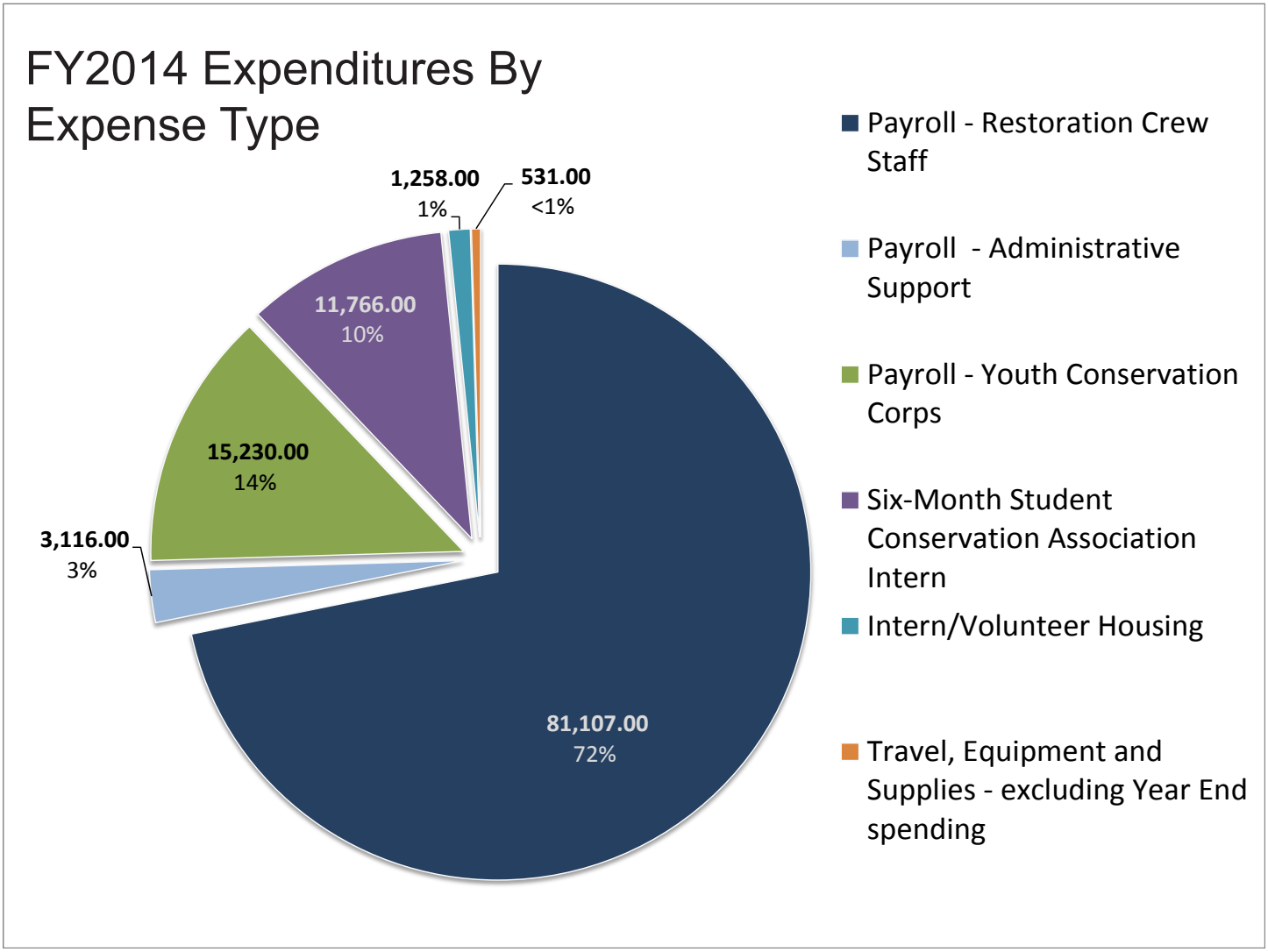


FY2014 Budget and Expenses

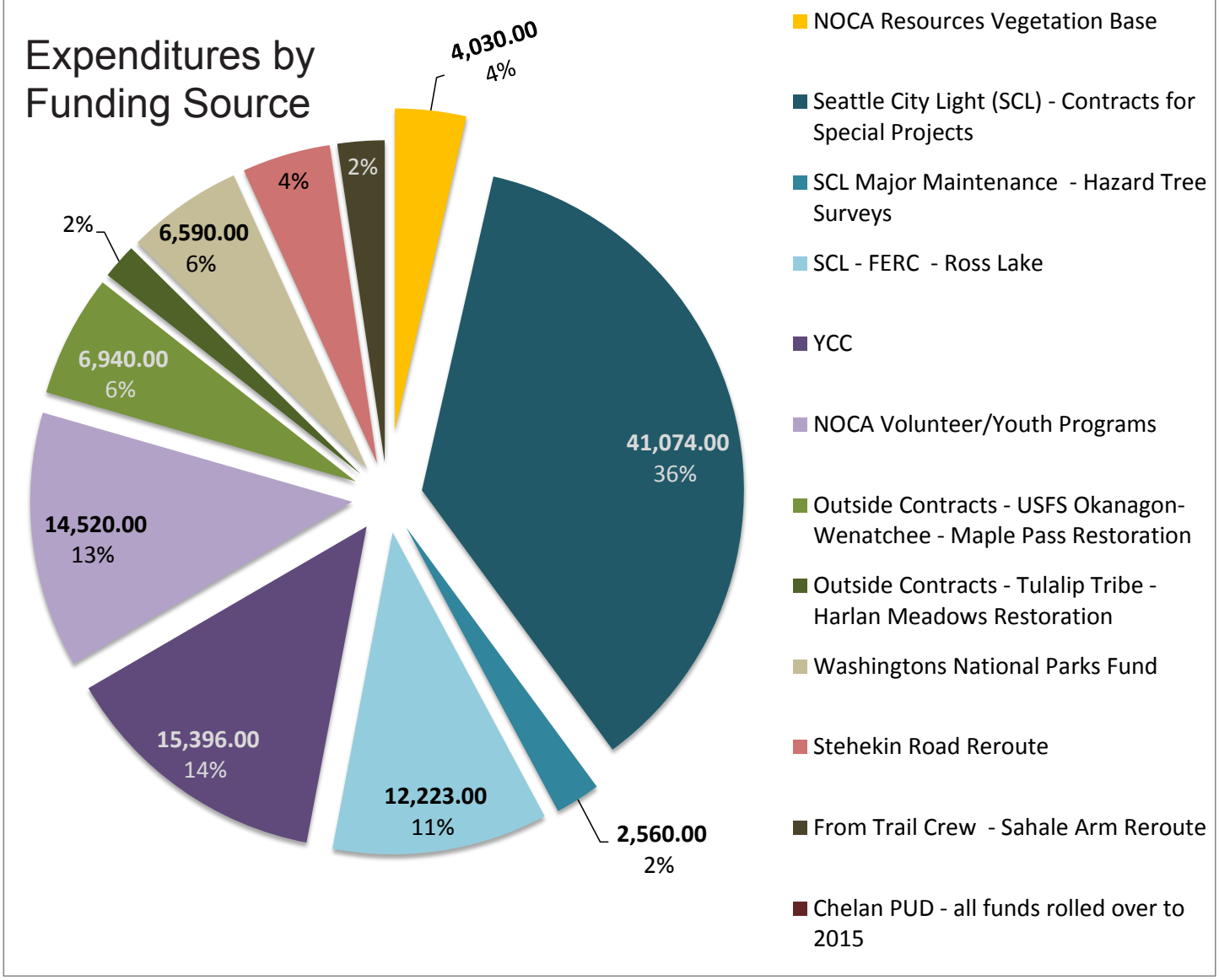
Total expenditures $113,000

Nearly 90% of the 2014 Native Plant Restoration Program budget went to labor costs. Labor makes up the majority of then expenses becaue all of the work of the program depends upon staff and intern hours for collecting and sowing seed, weeding, watering, maintaining plant collections, planning projects, installing plants at revegetaion sites and supervising staff, interns, volunteers and youth program participants.

	2013	2014
Payroll Expenditures	110,946.00	84,223.00
Youth Conservation Corps	18,988.00	15,230.00
Student Conservation Association Interns	14,825.00	11,766.00
Equipment and Supplies	2,605.00	421.00
Travel	60.00	110.00
Intern Housing	-	1,258.00
TOTAL	147,424.00	113,008.00



FY2014 Budget and Expenses



How We Fund Our Program

The Native Plant Restoration Program at NOCA receives 96% of its support from project funding.

Annually more than 25% of our budget came from support of Youth Programs at NOCA. For FY2014 we received Youth Conservation Corps (YCC), Youth Partnership Programs (YPP) and Volunteers in Parks (VIP) funds to support youths learning about and working on restoration projects in the park. These funds help pay for seasonal staff to supervise and train youth participants while accomplishing our core goal of protecting native plant populations in the Park.

Seatle City Light and Chelan Public Utiltites Department also provides significant funding (25%) to the program through Federal Energy Regulatory Commision (FERC) agreements.

Other essential funding comes from Washington's National Parks Fund , other grants and special contracts/interagency agreements.

2015 Plant Production Goals

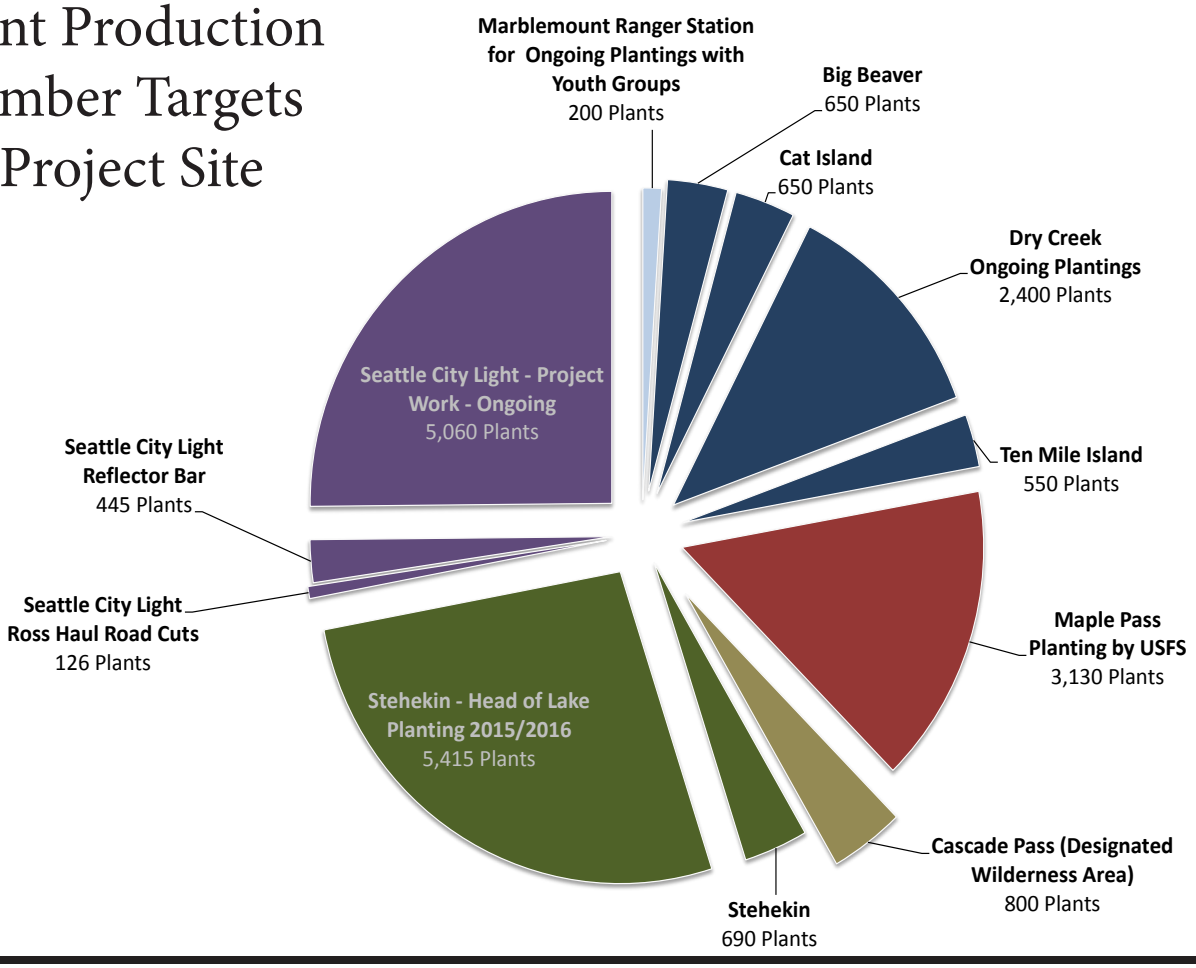
Plant Production for 2015 will be increased. The target plant production number for 2015 is 20,165 plants including 63 species for 12 planting projects. This is an increase of approximately 60% from 2014.

Much of the anticpated increase is due to the implementation of a production agreement with Seattle City Light (SCL) in which the NOCA Restoration Program will be propagating and maintaining on-hand plant collections for SCL to be available for short term project use. Additional increases are due to 2015/2016 planting plans for the Stehekin - Head of Lake Habitat Enhancement Project and completion of the plant production for the Maple Pass Restoration Project.

Plant Production Target Numbers - by Plant Type

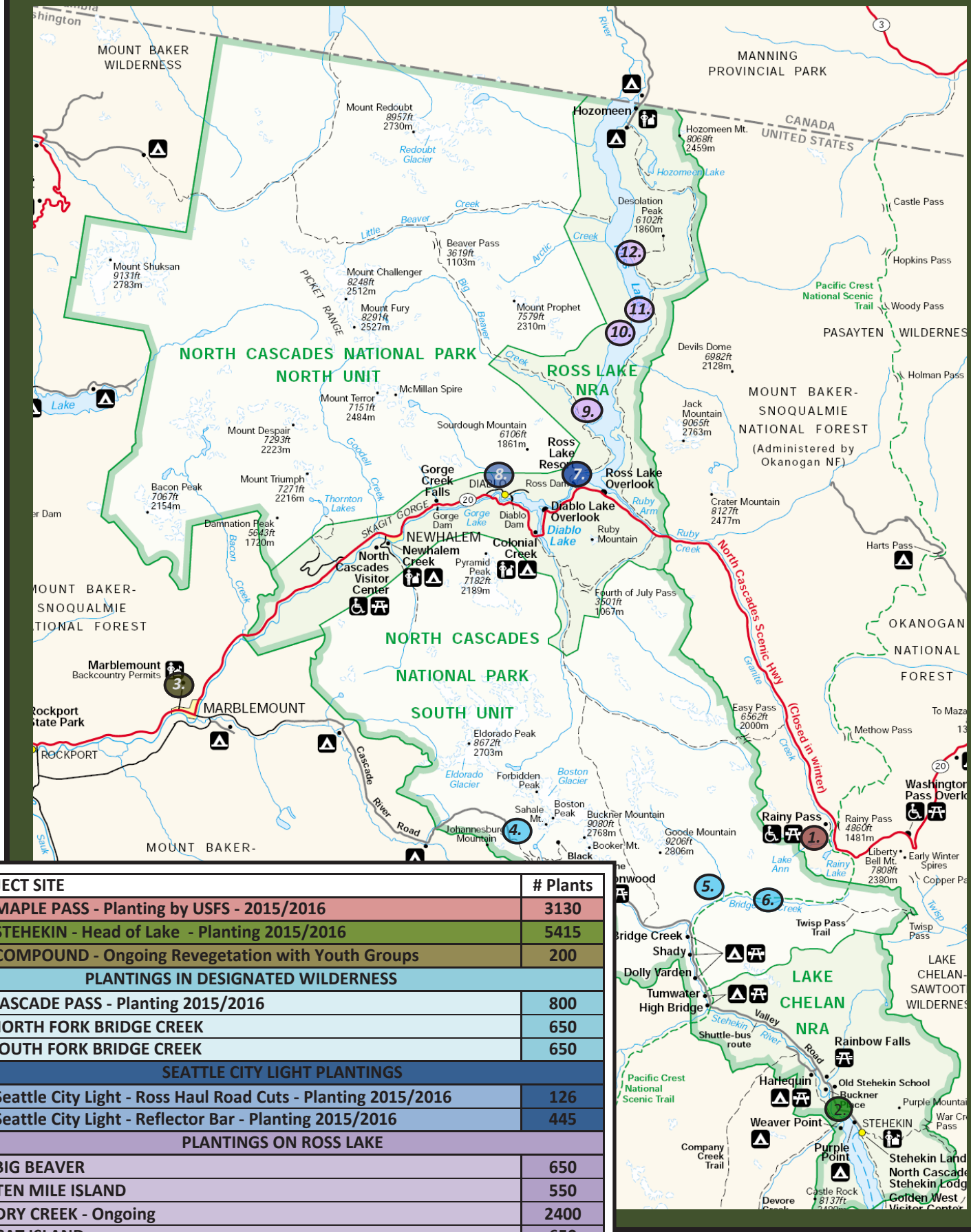
Plant Type	Target		Plant Type	Target
TREES	440		GRASSES	1,700
SHRUBS	6,045		WETLAND	5,700
FORBS and FERNS	1,730		SUBALPINE	4,550
	TOTAL		20,165	

Plant Production Number Targets By Project Site



North Cascades National Park
Native Plant Restoration Program
2014 YE Report

2015 Planned Planting Sites



PROJECT SITE	# Plants
1. MAPLE PASS - Planting by USFS - 2015/2016	3130
2. STEHEKIN - Head of Lake - Planting 2015/2016	5415
3. COMPOUND - Ongoing Revegetation with Youth Groups	200
PLANTINGS IN DESIGNATED WILDERNESS	
4. CASCADE PASS - Planting 2015/2016	800
5. NORTH FORK BRIDGE CREEK	650
6. SOUTH FORK BRIDGE CREEK	650
SEATTLE CITY LIGHT PLANTINGS	
7. Seattle City Light - Ross Haul Road Cuts - Planting 2015/2016	126
8. Seattle City Light - Reflector Bar - Planting 2015/2016	445
PLANTINGS ON ROSS LAKE	
9. BIG BEAVER	650
10. TEN MILE ISLAND	550
11. DRY CREEK - Ongoing	2400
12. CAT ISLAND	650