



The National Forest Genetics Laboratory

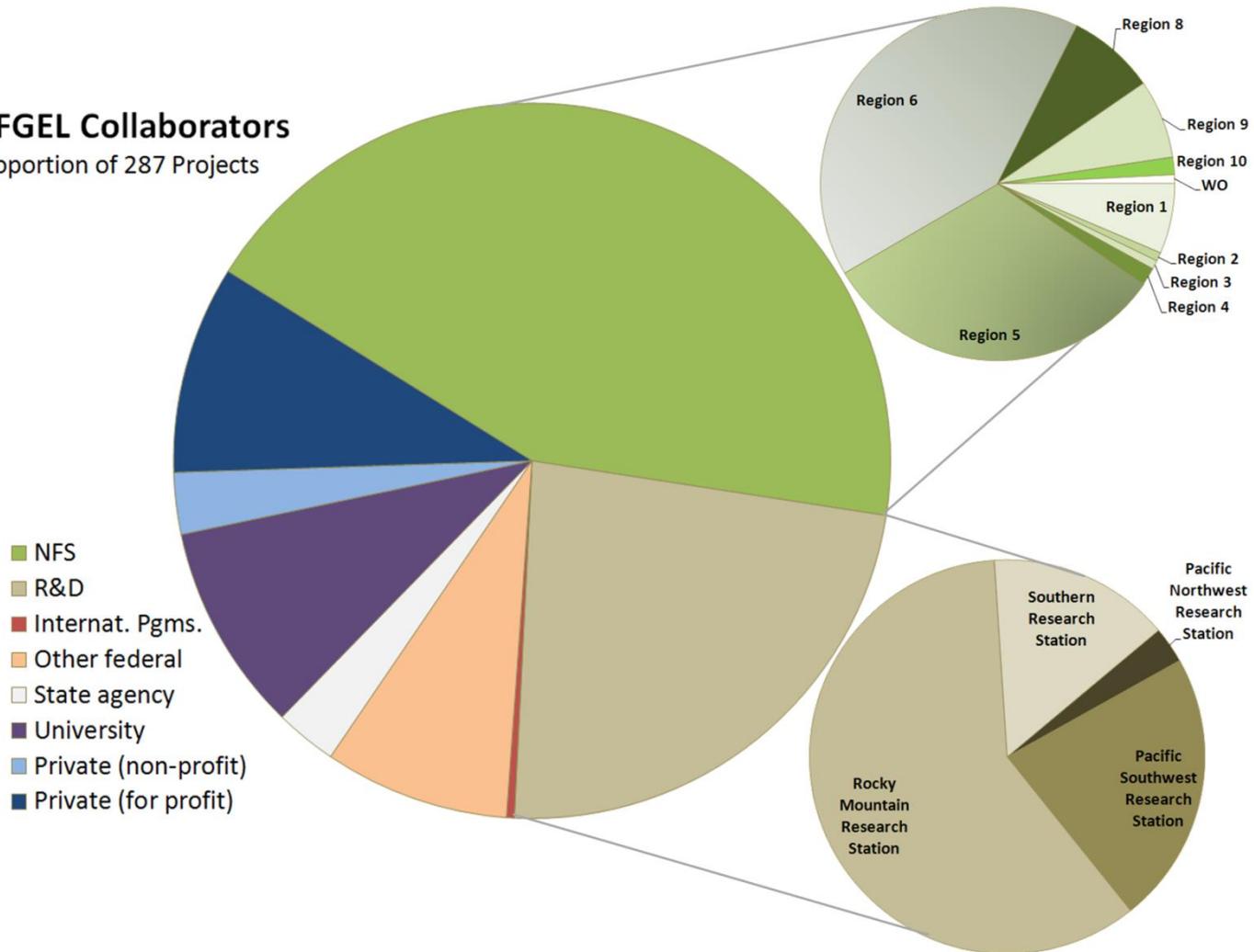
Steering Committee Meeting

May 20-21, 2014
Washington Office

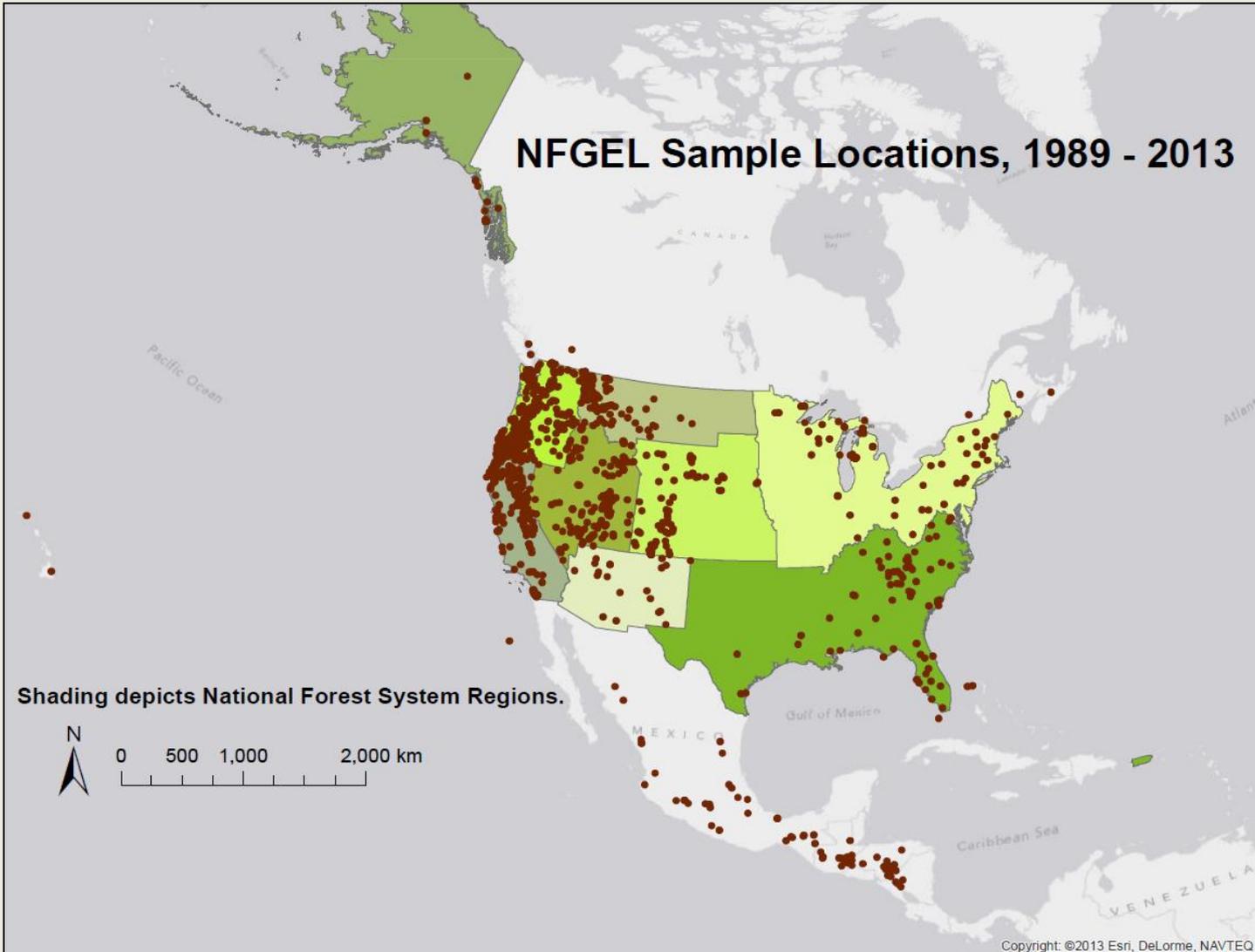
Overview and Trends

NFGEL Collaborators

Proportion of 287 Projects

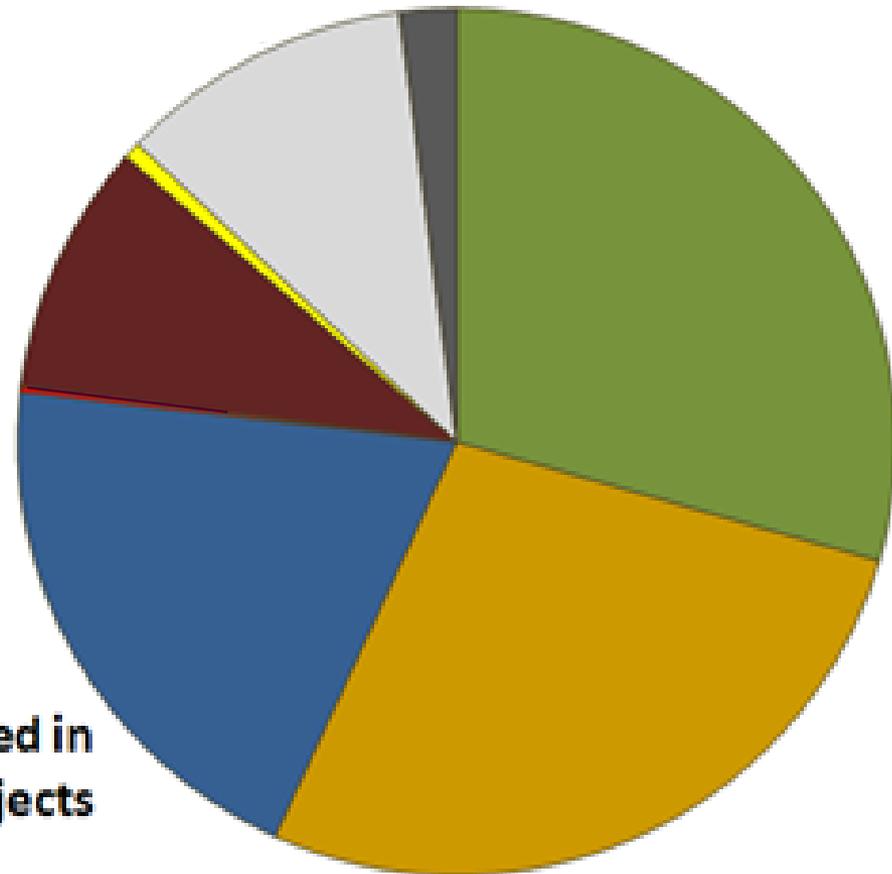


Overview and Trends



Overview and Trends

- Nurseries, seed collections
- Genetic diversity & structure
- Conservation & restoration
- Species identification
- Forensics
- Product delivery
- Dropped



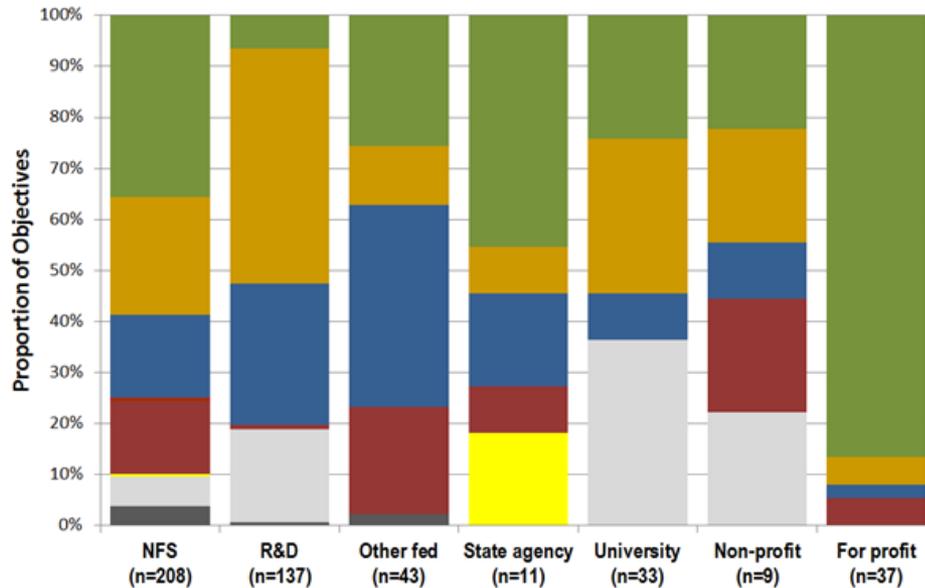
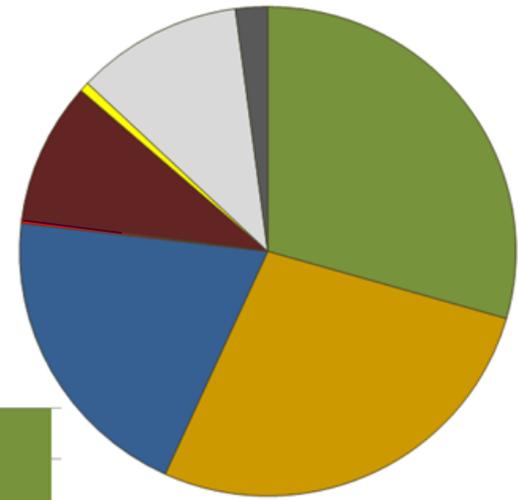
**479 Objectives assessed in
287 Projects**

Overview and Trends

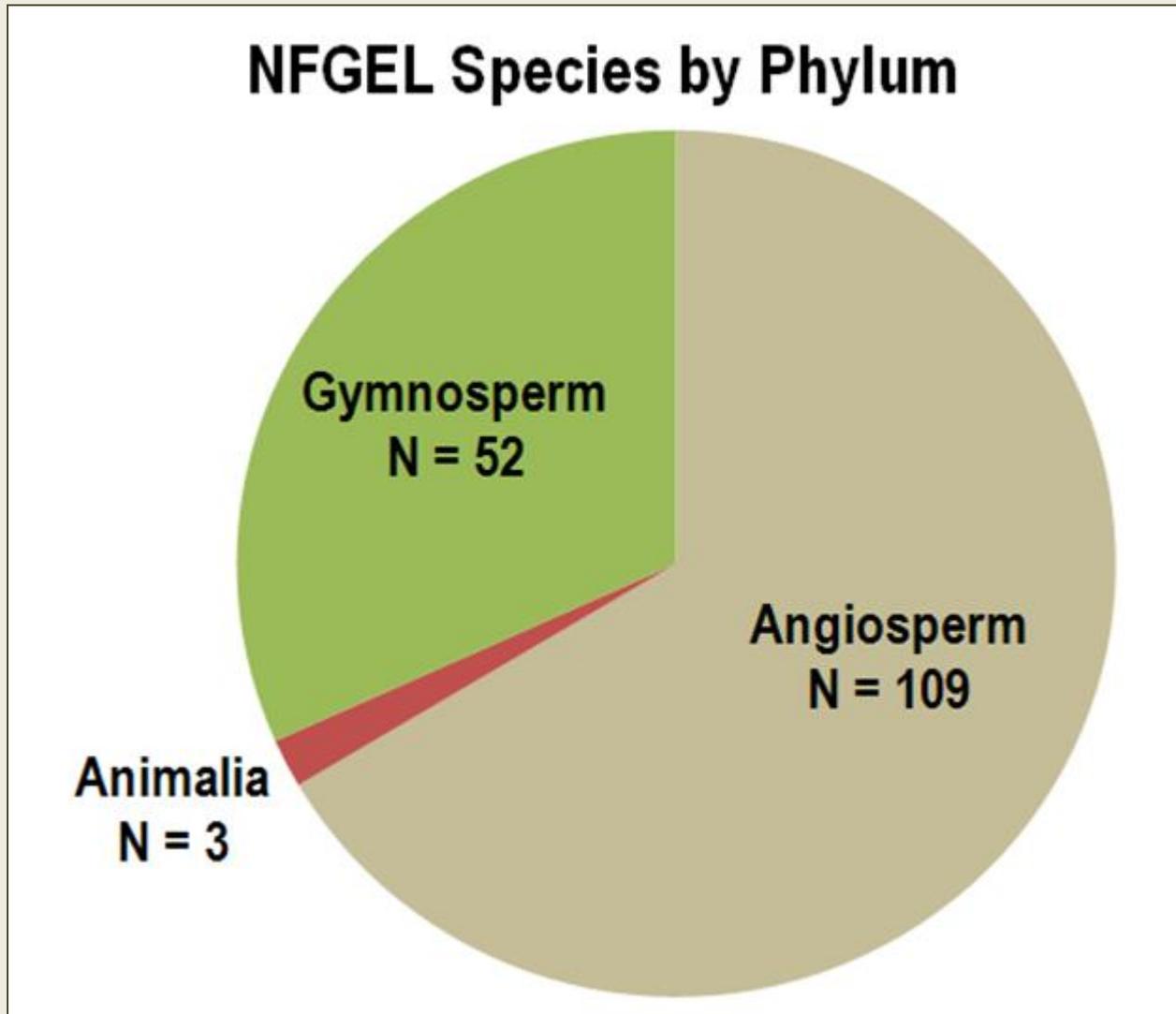
NFGEL Project Objectives by Category and Collaborator

479 Objectives assessed in 287 Projects

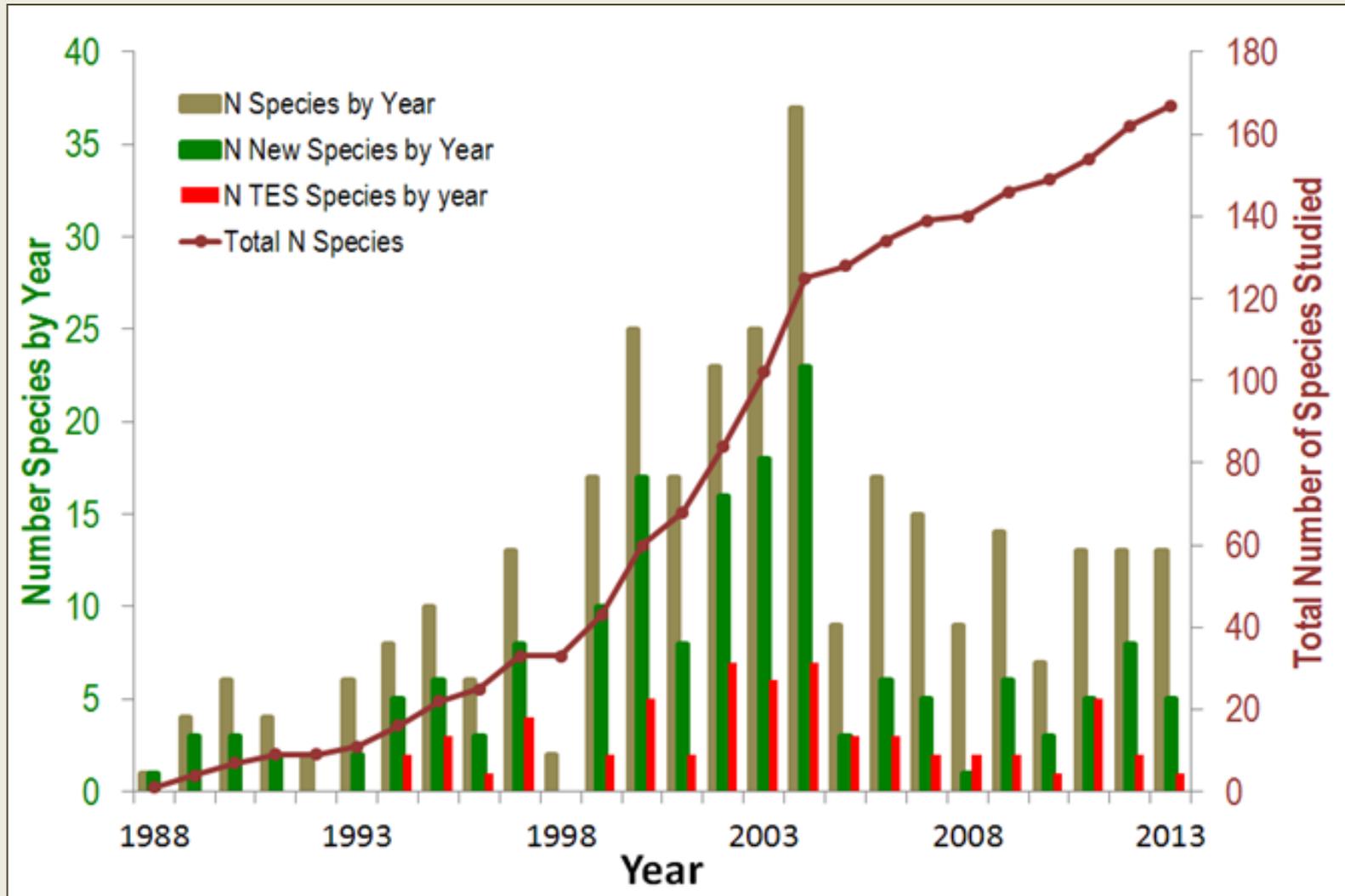
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Overview and Trends



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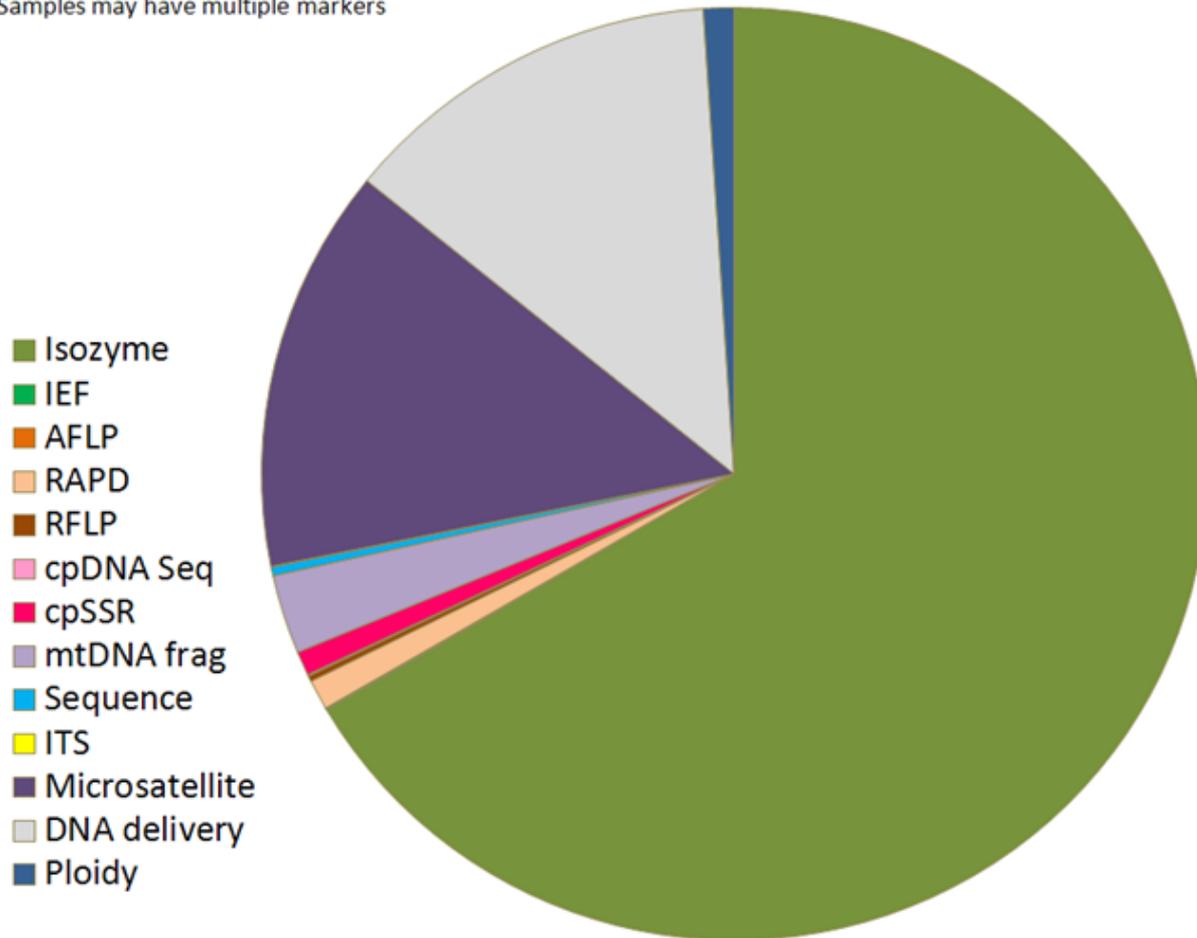


Overview and Trends

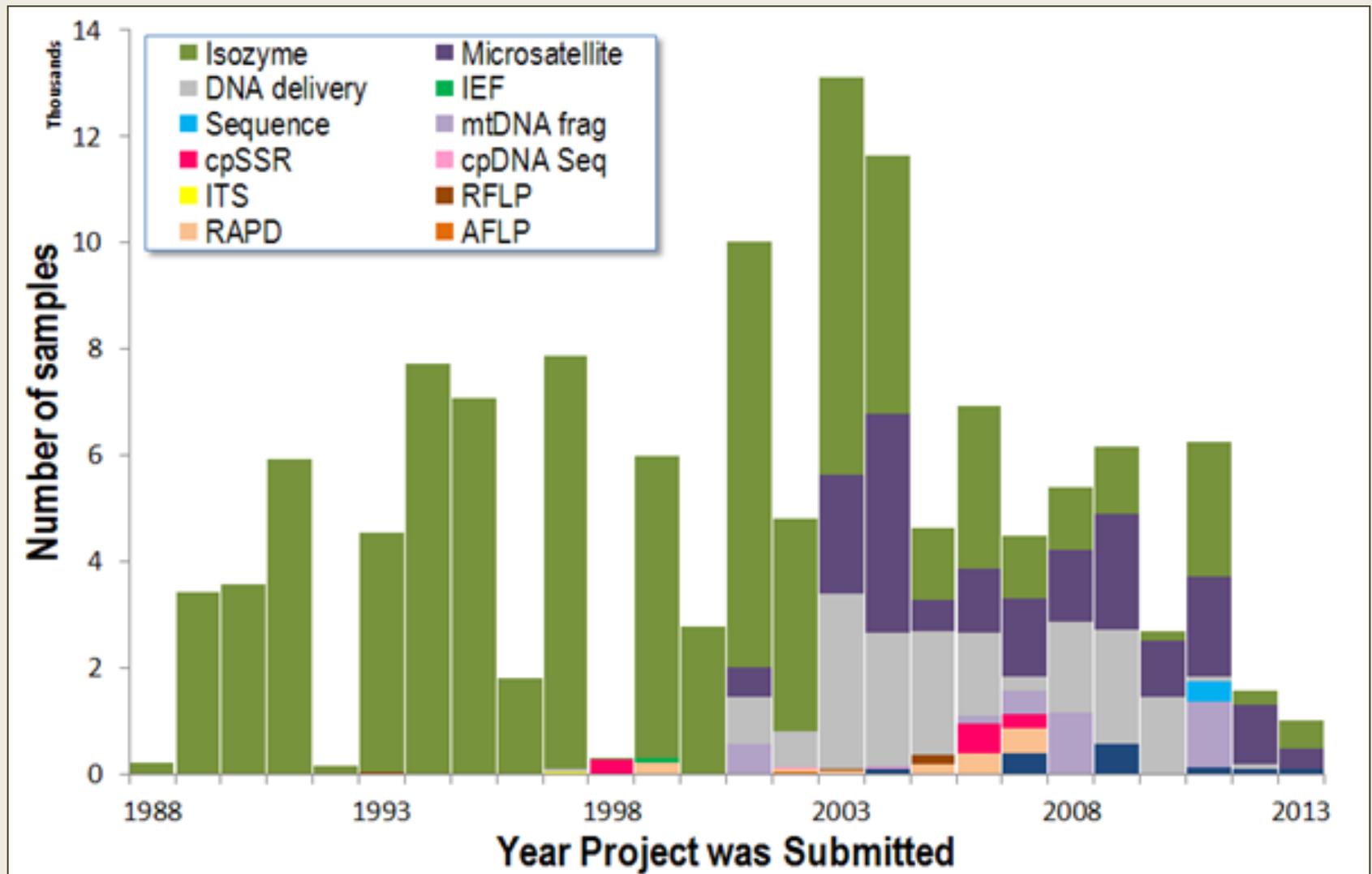
NFGEL Samples by Marker Type

Proportion samples analyzed for each marker type

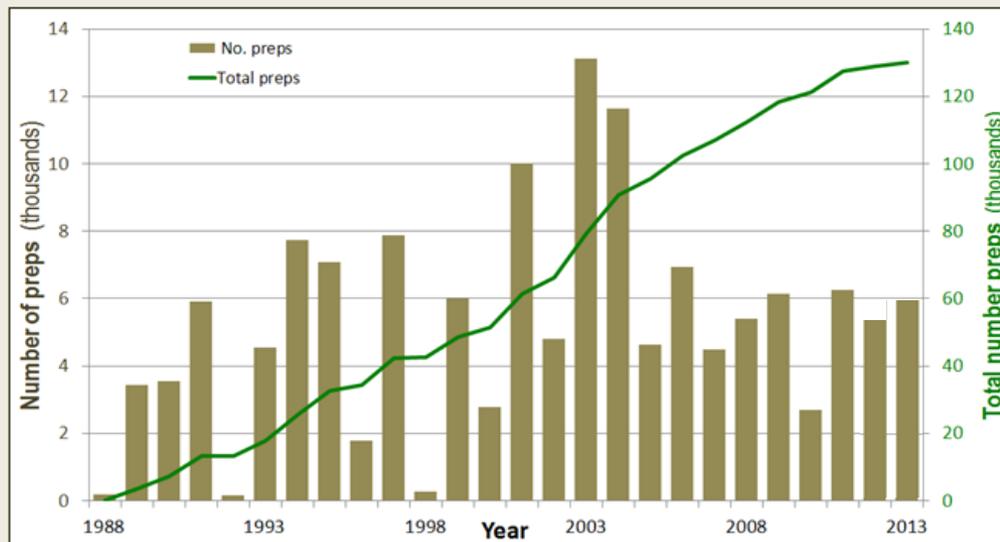
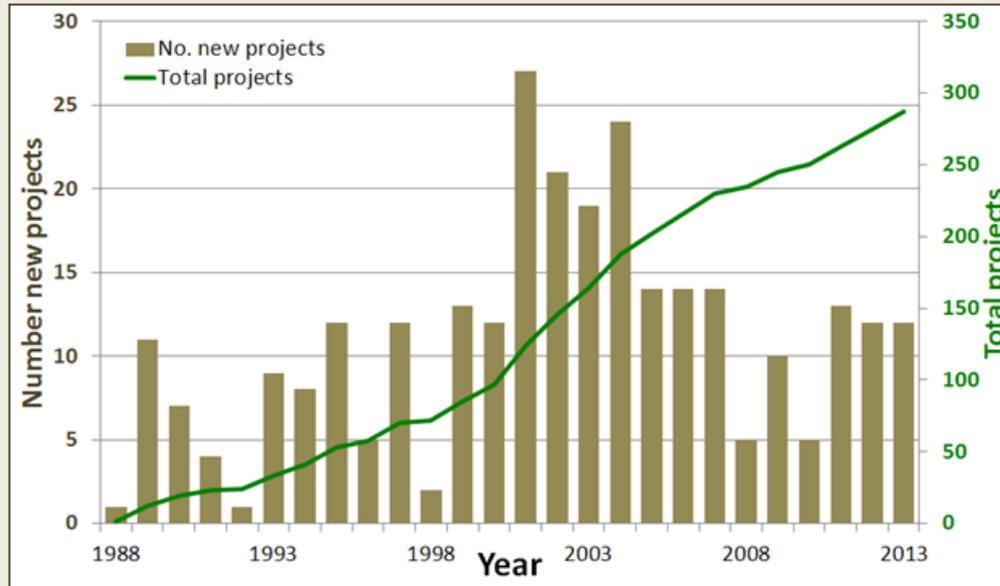
Samples may have multiple markers



Overview and Trends



Overview and Trends



Budget

ALLOCATION	FY13 Actual	FY14 Estimate
WO - Forest Management (NFVW allocation)	\$480,000	\$473,500
Soft Money (non-allocation)	\$59,190	\$168,000
TOTAL	\$539,190	\$641,500
EXPENDITURES		
Salary - Permanent Employees	\$241,527	\$300,000
Salary - Temporary Employees	\$113,383	\$100,000
Site Utilities and Rents	\$16,800	\$20,786
Chemicals and Supplies	\$76,076	\$80,000
Equipment and Repair	\$54,438	\$50,000
Computer and Office Supplies	\$11,477	\$10,000
Postage	\$1,092	\$1,000
Administrative Costs (page charges, Linc passes)	\$2,894	\$3,000
Hazardous Waste Removal	\$957	\$1,500
Vehicle	\$5,082	\$5,000
Contracts	-----	\$60,000
Travel and Training	\$15,683	\$11,000
TOTAL	\$539,409	\$642,286
BALANCE	\$0	\$0

Staffing

EMPLOYEE	POSITION	TOUR (% FTE)	SERIES-GRADE
Valerie Hipkins	Director	Permanent (100%)	0460-13
Jennifer DeWoody	Geneticist	Permanent (100%)	0440-12
Randy Meyer	Lab Biotechnician	Permanent (55%)	0404-07
Jody Mello	Biol Sci Technician	Temp-Pathways (75%)	0499-05
Rosanna Hanson	Forestry Tech (Research)	Temp-1039 (50%)	0462-05

Projects – *FY14 complete*

PROJECT#	PARTNER	SPECIES	CONTACT	PROJECT TITLE	STATUS
251	FS-R5	Fritillaria eastwoodiae	J. Nelson	Population genetics study of Fritillaria eastwoodiae	Original lab report submitted in FY12. One population added and a report addendum submitted late 2012. Additional sample collections received in 2013. Isozyme and ploidy analyses complete. DNA extracted and stored. Information has been re-analyzed and a second report addendum submitted February 2014.
279	Center for Natural Lands Management	San Diego Thornmint	D.Rogers	Population Genetics Study of Acanthomintha ilicifolia	Project Complete
281	Private Company	Slash Pine, Loblolly Pine	-----	Ramet identification in slash and loblolly pine clones	Project Complete
289	FS-PSWRS	Poplar	M.Zinkgraf	DNA extraction of poplar samples	Project Complete
291	UC Davis	Douglas-fir	M.Crepeau	Confirmation of haploid nature of Douglas-fir megagametophyte samples	Project Complete
282	FS-R5	Vaccinium spp	J.Nelson	Genetic differentiation in Vaccinium from northern California: resolving differences between Lake Shasta and Sierra populations	Project Complete
292	UC Davis	Douglas-fir	D.Young	Fine scale spatial genetic structure in Douglas-fir: understanding out climate change will impact California forests	Project Complete
296	R5	Giant Sequoia	G.Lunak	Archiving genetic material for Giant Sequoia conservation	Project Complete
297	Olympic Resource Management	Douglas-fir	D.Cress	Clonal identity of five Douglas-fir ramets	Project Complete

Projects - *ongoing*

PROJECT					
#	PARTNER	SPECIES	CONTACT	PROJECT TITLE	STATUS
232	BLM/FS-R1-4	Ponderosa Pine	R.Means; MF Mahalovich	Genetic testing of disjunct Ponderosa Pine stands on BLM lands in Wyoming and throughout the west	In reporting.
248	FS-R6	Golden Chinquapin	A. Bower	Genetic structure of Golden Chinquapin (<i>Chrysolepis chrysophylla</i>)	716 samples. Isozymes extracted; 1/3 of samples run; marker dropped due to poor resolution. DNA isolated; 10 SSRs have been tested: 8 have been applied to current set of full samples. 10 additional SSRs are awaiting testing. A next-generation sequencing approach is being tested with partners from Oregon State University.
254	BLM	Ponderosa Pine	B. Means	Genetics relationships of isolated, disjunct ponderosa pine stands	In reporting.
258	FS-R6	<i>Sisyrinchium sarmentosum</i>	A. Bower	Hybridization and species identity in <i>Sisyrinchium sarmentosum</i>	Ploidy complete; SSR marker development unsuccessful; DNA sent to Rich Cronn (USFS-PNWRS) for next-gen sequencing (cpDNA SNPs). Data is in analysis and reporting.
259	FS-R8	Longleaf Pine	B. Crane	Is there a genetic difference between the traditional coastal sources and the piedmont sources of longleaf pine?	Isozyme data complete. SSR data complete. SSR data sent to Craig Echt (USFS-SRS) for combination with SRS data and full analysis.

Projects - *ongoing*

PROJECT					
#	PARTNER	SPECIES	CONTACT	PROJECT TITLE	STATUS
268	FS-R6	Oregon White Oak	A.Bower	Oregon white oak genetic diversity and geographic differentiation	Isozyme prepped and DNA extracted from samples that have arrived. Waiting for additional samples to arrive before lab analysis begins.
270	Oregon State Univ.	Douglas-fir, Western White Pine	G.Howe	SNP development in Douglas-fir and western white pine	DNA extracted and shipped to University of Arizona for SNP development. Report pending.
273	FS-R1-6/BLM	Ponderosa Pine	M.Mahalovich / R.Means	Genetics relationships of isolated, disjunct ponderosa pine stands	DNA extracted, isozymes prepped, needles counted. Awaiting any additional collections before analysis. These samples will fill in holes in the ponderosa database or be off site stands that need seed source identification.
277	Northwest Tree Improvement Cooperative (NWTIC)	Douglas-fir	K.Jayawickrama	Genetic Quality Control Study in Coastal Douglas-fir	To date, we have received samples over 750 clones (over 2,800 ramets). DNA has been extracted from clonal bulk collections and some individual ramet collections to verify mislabeling. SSR data has been collection on all samples at 6 loci. We also sent DNA from 282 samples to University of Arizona to test the utility of SNP data to address project objectives (data has been received and is being assessed). Further clonal samples are still expected to be received.
285	Private Company	Poplar	-----	DNA fingerprinting elite populus clones	SSRs (12 loci) complete on samples received to date. Waiting for 10 additional samples to arrive.

Projects - *ongoing*

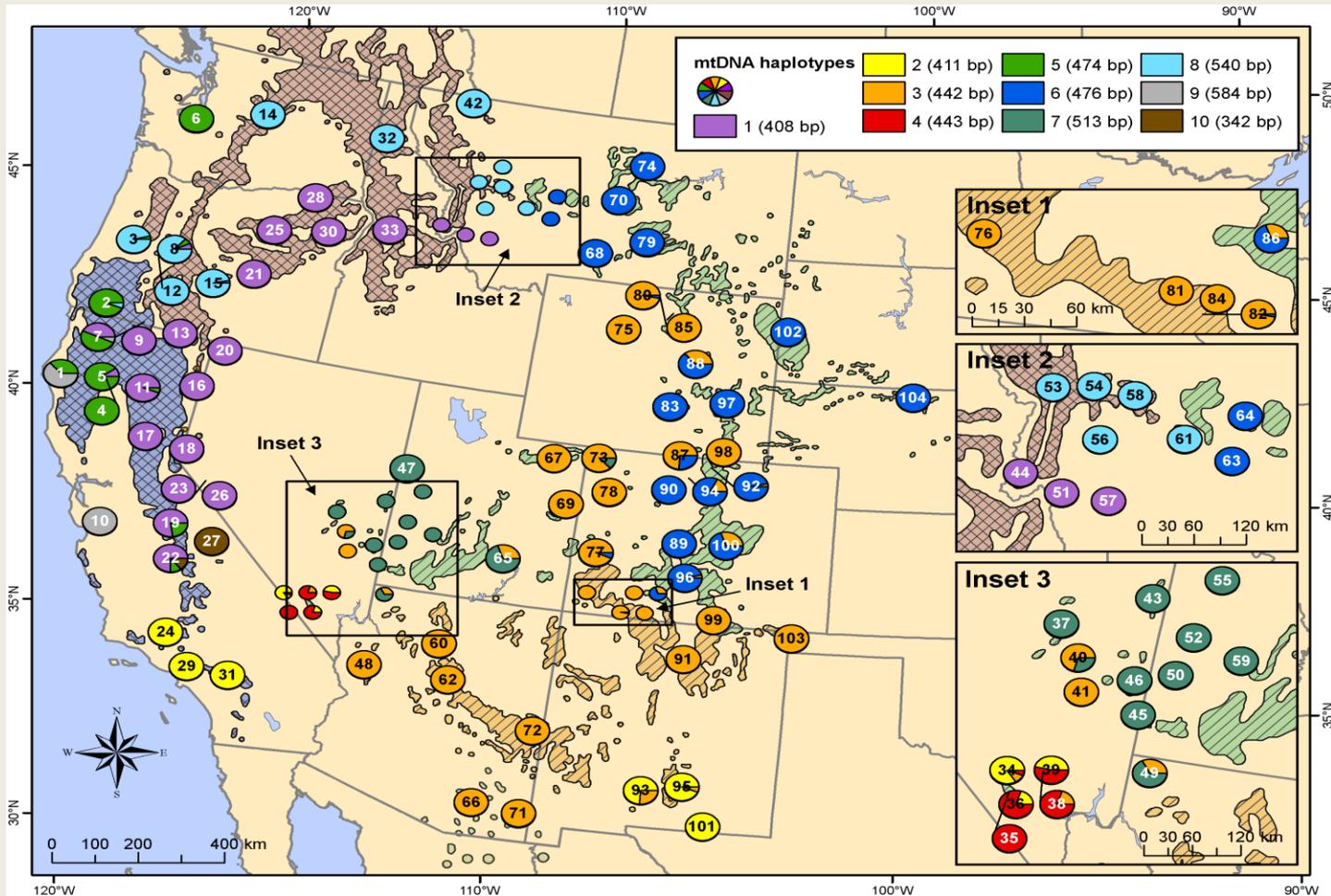
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286	FS-R9	Butternut	S.Rogers	Identifying butternut (<i>Juglans cinerea</i>), Japanese walnut, and their hybrids	DNA extracted. Laboratory analysis using 4 markers in underway. (CAPS and SCAR markers of ITS, other nuclear loci, and cpDNA loci are being used).
288	FS-R5	Ponderosa Pine	G.Lunak	Verification of controlled mass pollination (CMP) in two ponderosa pine seedlots	DNA has been extracted from 380 meg/embryo pairs. Samples are waiting for SSR analysis to be conducted.
290	FS-R8	Atlantic white cedar	B.Crane	Atlantic white cedar conservation and restoration	37 samples from four locations received. DNA extracted and isozymes prepared. Waiting for additional samples and proposal form.
295	FR-R1	Festuca species	M.F.Mahalovich	Species identification and cultivar detection in <i>Festuca</i> collections from Montana	Seed received. Seed germinated and is in early growing phase in greenhouse. DNA/isozyme/ploidy analysis planned.
294	FS-R8	Table Mtn Pine	B.Crane	Table mountain pine conservation and restoration	Waiting for additional samples to arrive. DNA extracted from the samples received. SSR analysis planned.
293	FS-PSW	Poplar	M.Zinkgraf	DNA extraction from poplar	Waiting for additional samples to arrive. DNA extracted from the samples received.

Projects — *in development*

PARTNER	SPECIES	PROJECT TITLE
Center for Natural Lands Management	Spineflower	Genetic studies of <i>Chorizanthe parryi</i> var. <i>fernandina</i> (San Fernando Valley Spineflower)
FS-R6	<i>Sidalcea</i>	Resolving taxonomic confusion around <i>Sidalcea setosa</i> and <i>Sidalcea oregana</i> ssp. <i>spicata</i>
FS-R6	<i>Lewisia columbiana</i>	Taxonomy of <i>Lewisia columbiana</i>
FS-R6	<i>Packera</i>	A molecular genetic comparison of <i>Packera</i> “novum” and <i>Packera cana</i> in Washington State
FS-all regions	<i>Botrychium</i>	Identification of <i>Botrychium</i> species
NRCS	Tanglehead	Is southern Texas Tanglehead more similar to local invasive Tanglehead or to non-invasive Australian Tanglehead
FS-R5	Sugar pine	Genetic diversity and structure of Southern California sugar pine
Green Diamond Resource Company	<i>Erythronium</i> spp.	Identifying <i>Erythronium</i> Species on Green Diamond Resource Company Property
FS-R10	<i>Vaccinium</i> spp.	Examining genetic distinctiveness of <i>V. ovalifolium</i> ssp. <i>alaskaense</i> , and testing the putative hybrid origin of “Beebleberry”.
FS-R10	Dune tansy	Examining the possible migrant source of a disjunct population of dune tansy (<i>Tanacetum bipinnatum</i> subsp. <i>Huronense</i>).
Sierra Pacific Ind.	<i>Lewisia</i> spp.	Morphometric analysis of the <i>Lewisia kelloggii</i> group from California.
FS-PSW	Torrey Pine	Identification of a natural population of Torrey pine.
FS-FHP	Dwarf Mistletoe	Molecular confirmation of the dwarf mistletoe pathogen.
FS-PNW/IP	Timber (wood)	DNA isolation from wood for purposes of timber theft prosecution.
FS-R8	Butternut	Hybrid identification in butternut.
FS-PSW	<i>Cronartium</i>	Molecular confirmation of the <i>Cronartium</i> pathogen.
FS-R10	<i>Elodea</i>	(1) Identification of invasive <i>Elodea</i> species. (2) Genetic variation within and among <i>Elodea</i> occurrences. (3) Clonal and source identification of <i>Elodea</i> occurrences.

Restoration, Silviculture, and Genetic Improvement

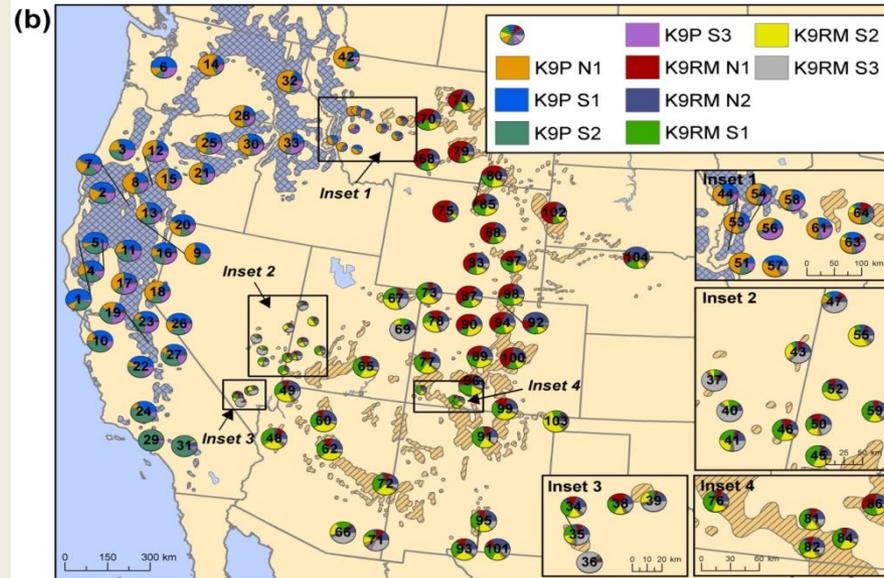
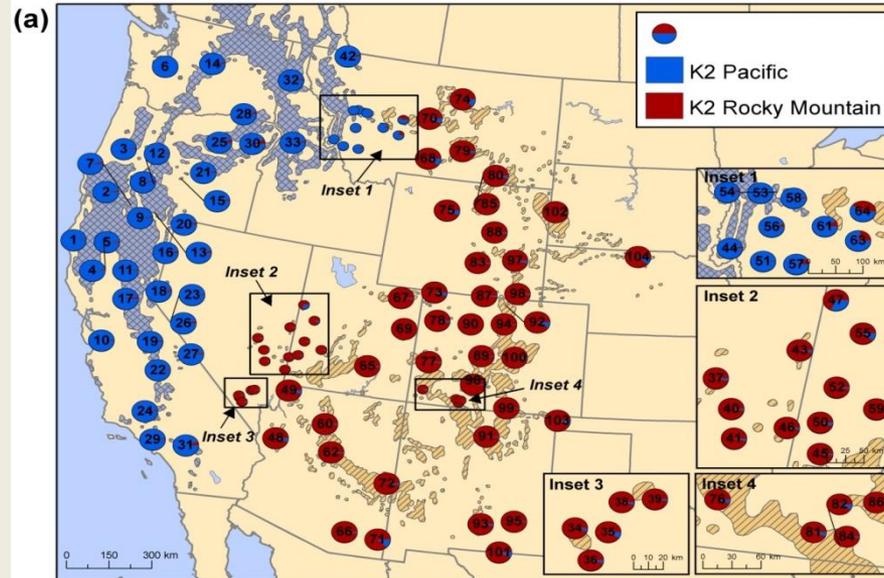
Ponderosa Pine Source Identification mtDNA



Restoration, Silviculture, and Genetic Improvement

Ponderosa Pine Source Identification

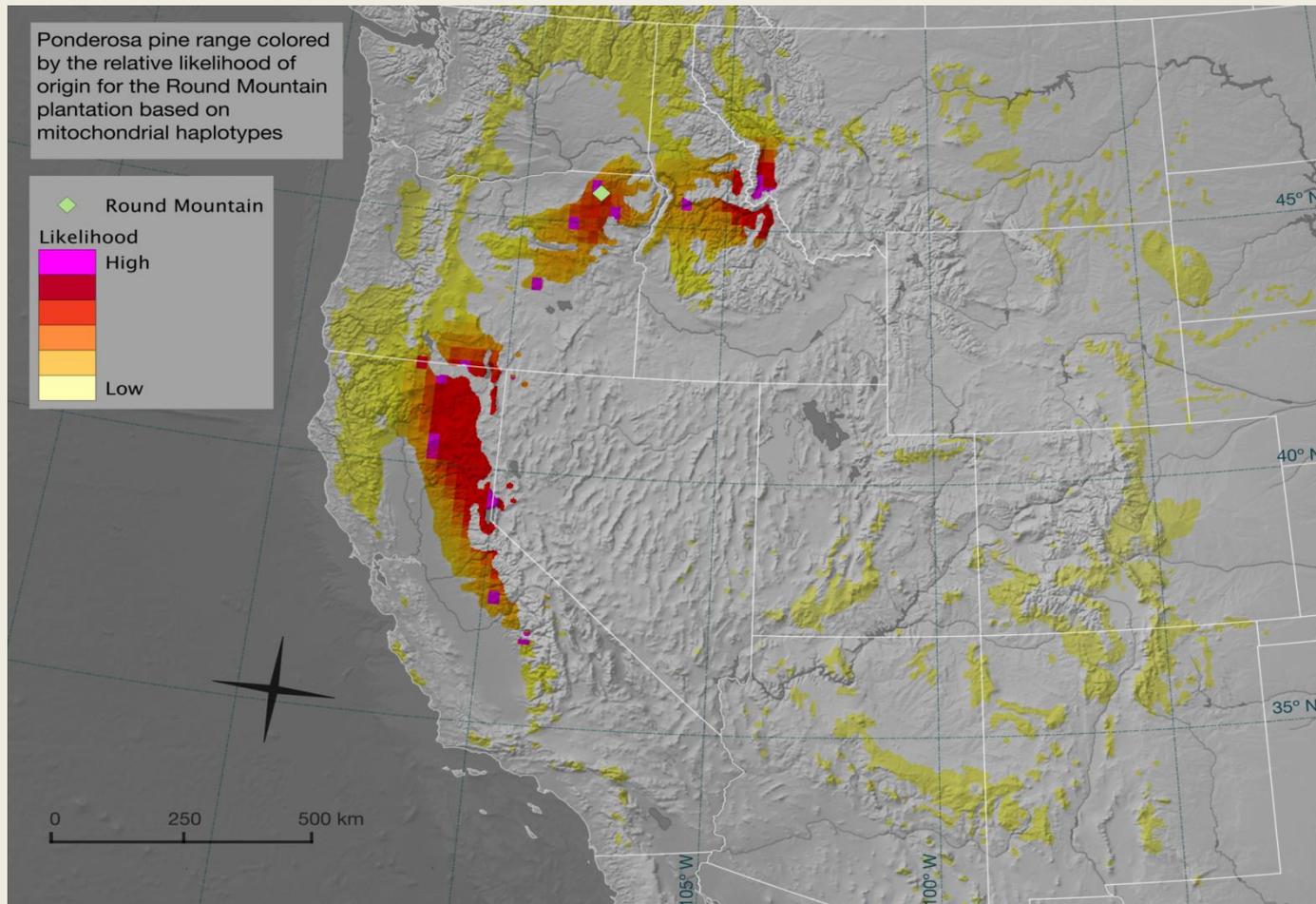
Nuclear DNA



Restoration, Silviculture, and Genetic Improvement

Ponderosa Pine Source Identification

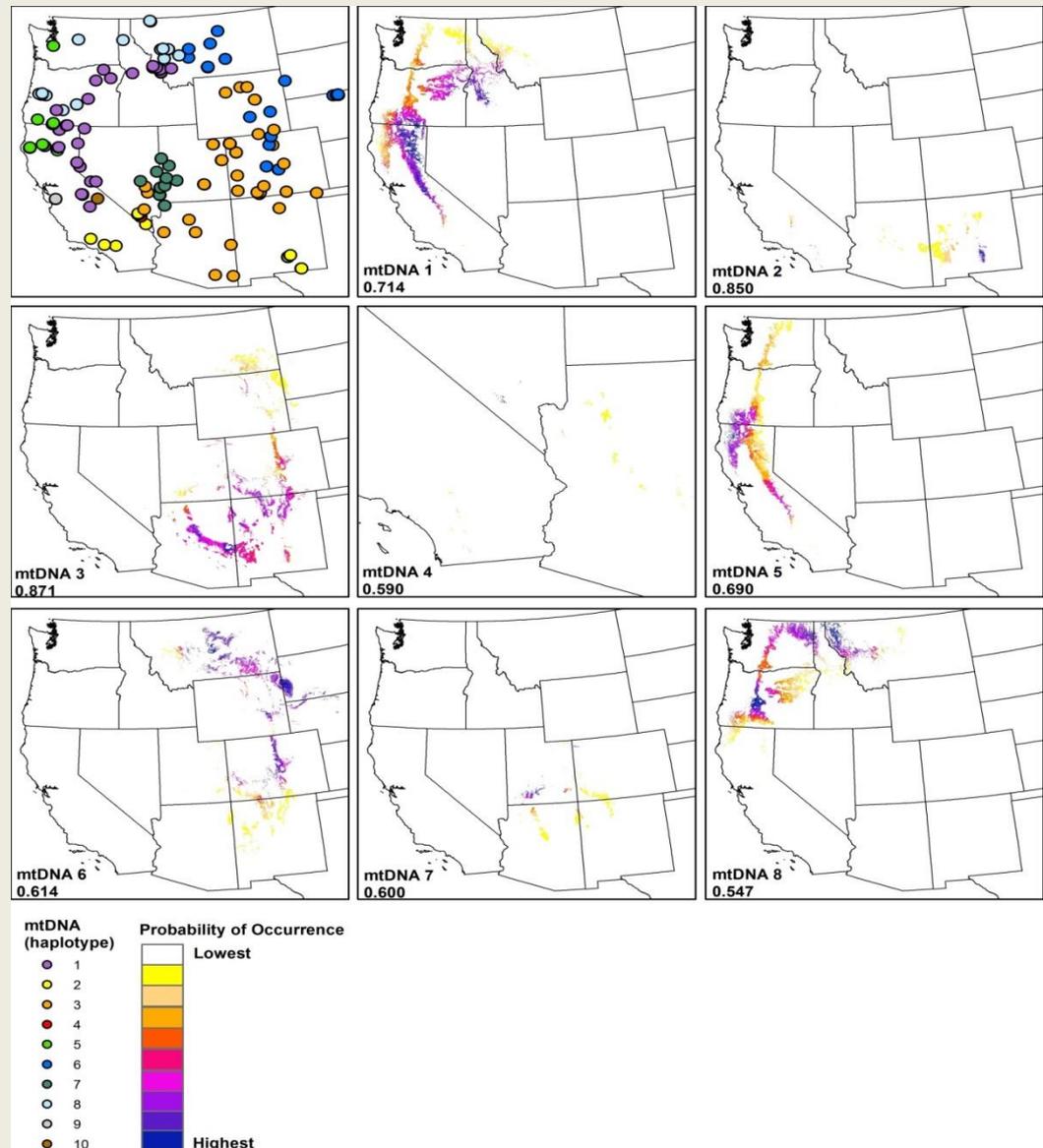
Identifying origin of unknown stands



Restoration, Silviculture, and Genetic Improvement

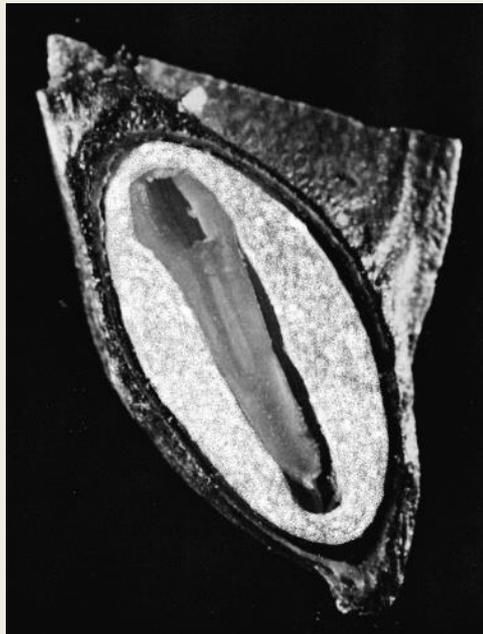
Ponderosa Pine Source Identification

Climate modeling: Doug Shinneman, USGS; Robert Means, BLM; NFGEL



Restoration, Silviculture, and Genetic Improvement

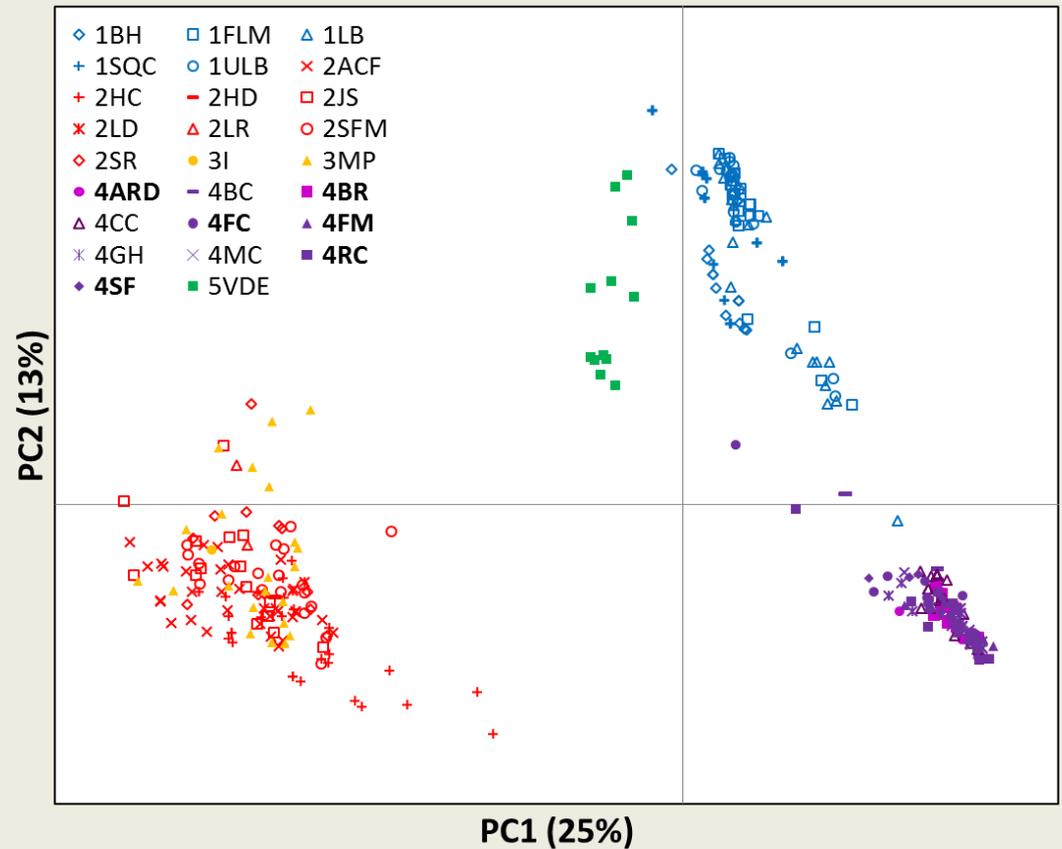
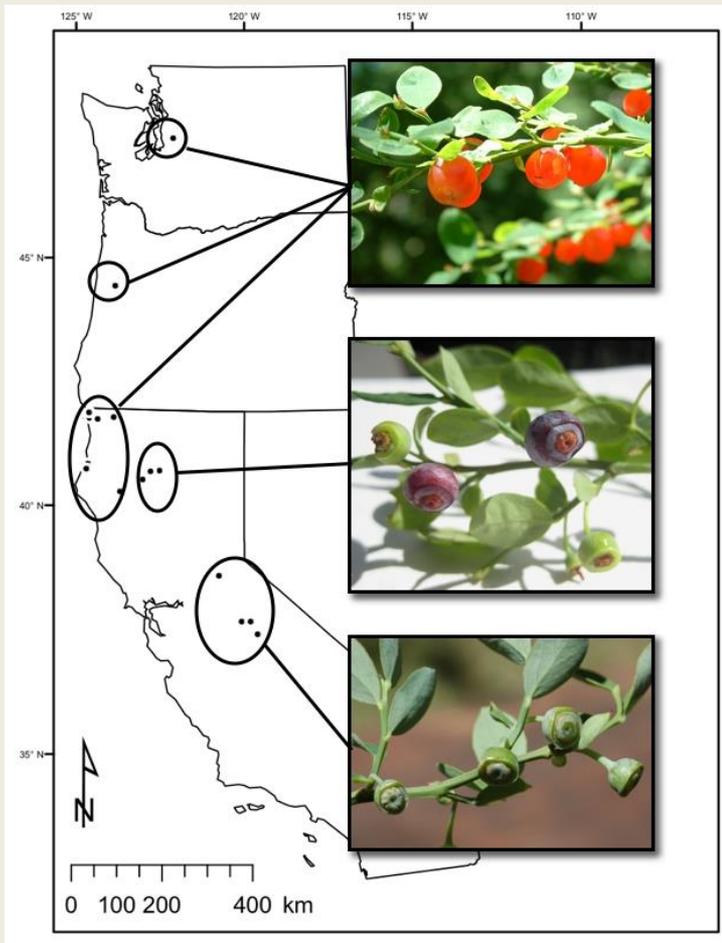
Verify Pollination Success in Conifers



Cross	2012 - light pollen year	2014 - heavy pollen year
	% contamination	% contamination
Mom 1 x Dad 1	5.0%	29.3%
Mom 2 x Dad 1	1.1%	29.5%

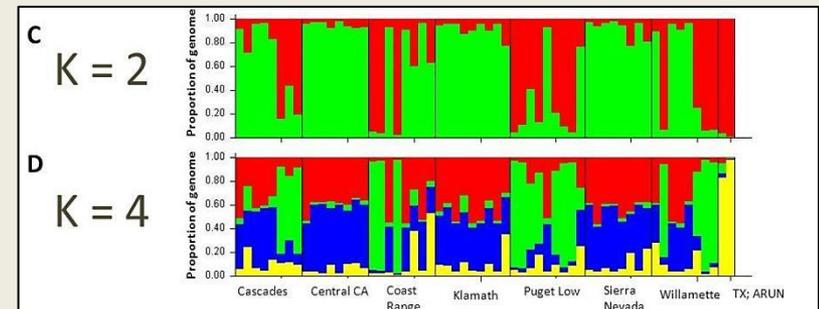
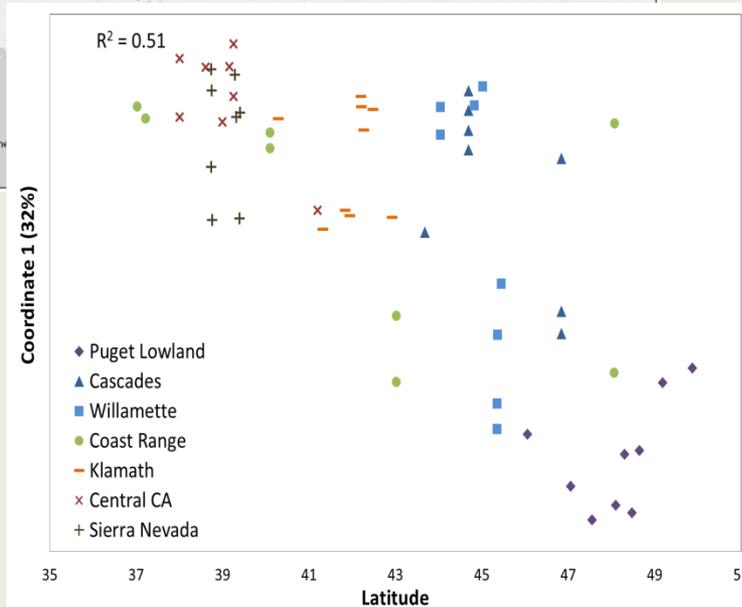
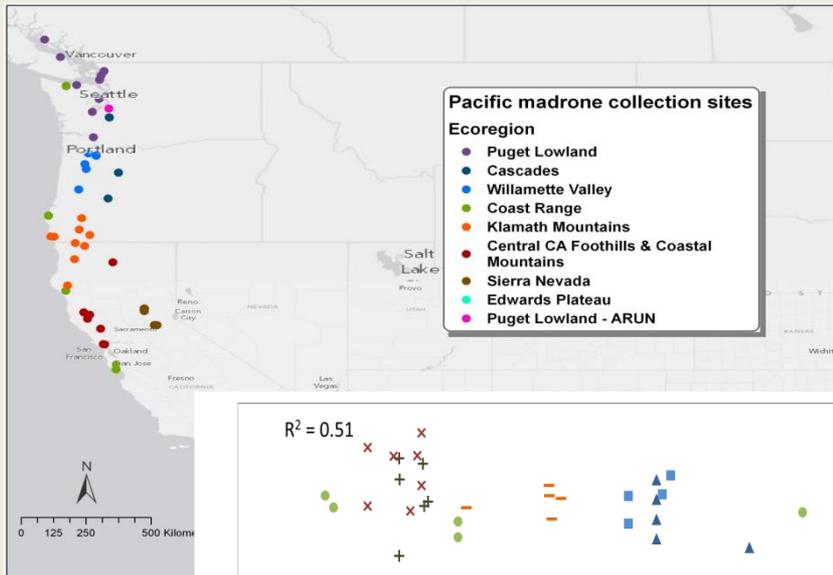
Conservation and TES Species

Genetic Differentiation in *Vaccinium*



Conservation and TES Species

Landscape genetics in Pacific Madrone



Forensics and Special Use

Bigleaf Maple Timber Theft

