2017 FIA User Group Meeting
April 4-5, 2017
Madison, WI

Wayne Robbie

USDA Forest Service-Southwestern Region
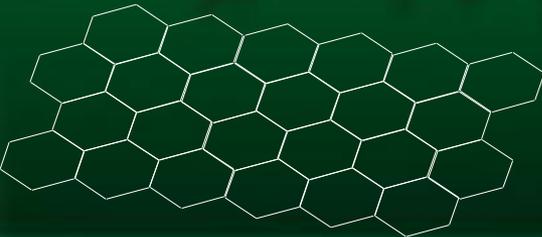
Renate Bush

USDA Forest Service – Northern Region
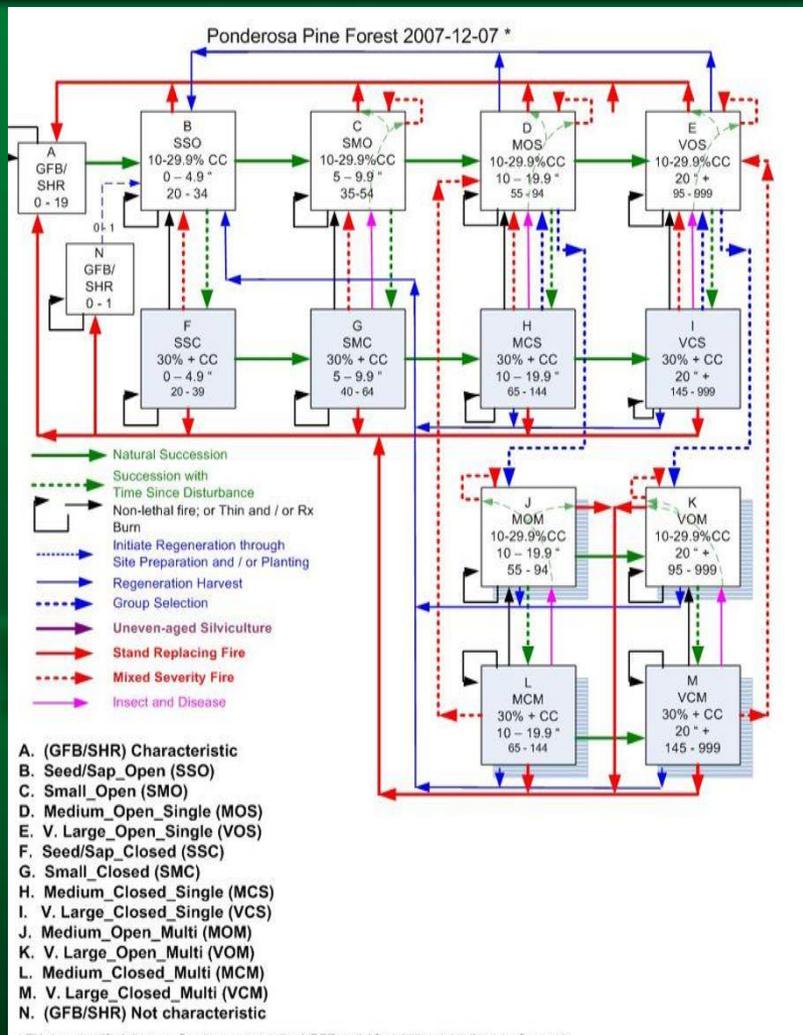
NFS R3 Projects & Applications

- Projects:

  – Mid-scale existing vegetation mapping project II. Collaborating with the Institute of Natural Resources-Oregon State University.

  – Calibration of State & Transition Models (Path/VDDT) with forest structure and cover classes.

  – Carbon Assessments: Regional and Forest Assessments.
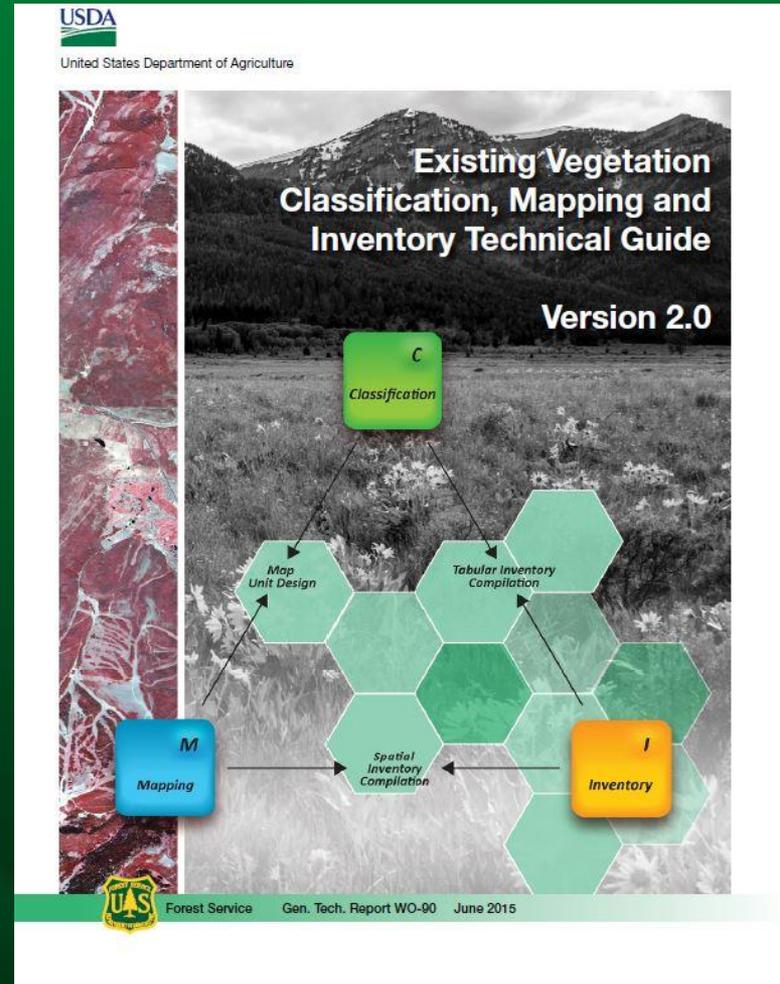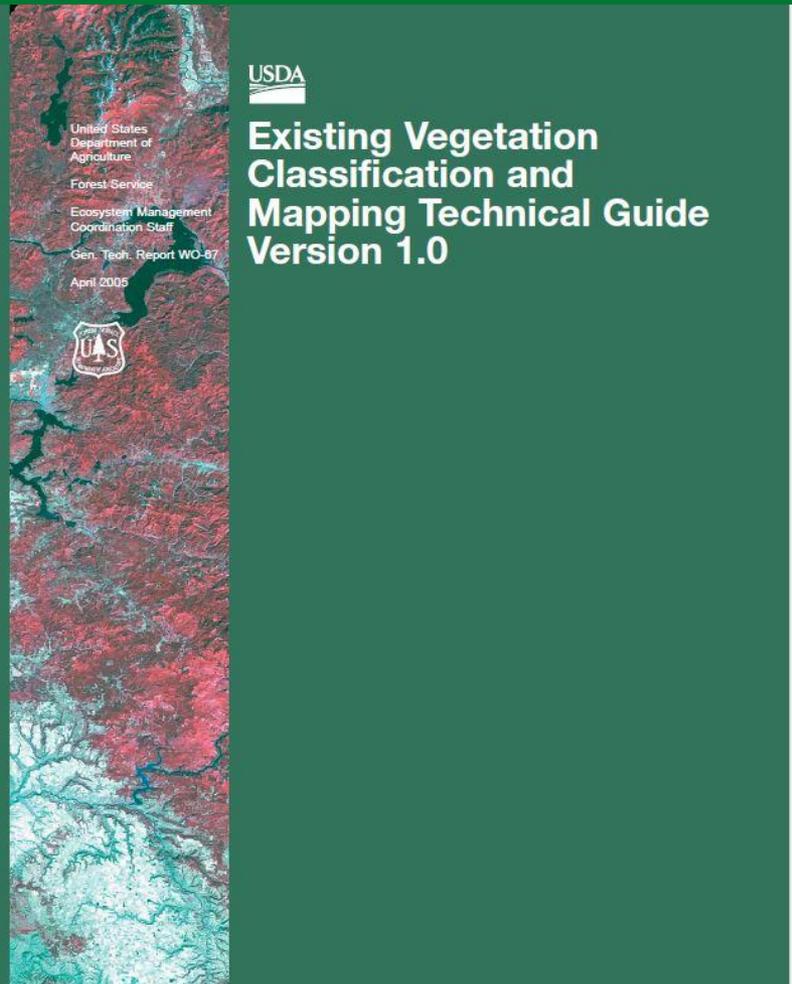
Southwestern Region FIA Data Calibration of State-and-transition Models

Ponderosa Pine Forest 2007-12-07 *

	B	PPG	Ponderosa Pine - Grass PNVT		Coarse-filter								
1	Vegetation Structure Variables:												
3	VDDT State:	A_GFB	B_SSO	C_SMO	D_MOS	E_VOS	F_SSC	G_SMC	H_MCS	I_VCS	J_MOM	K_VOM	L_MCM	M_VCM
5	Size Class	0	1	2	3	4	1	2	3	4	3	4	3	4
6	Size Class	0	1	2	3	3	1	2	3	3	3	3	3	3
7	Canopy Class	0	1	1	1	1	2	2	2	2	1	1	2	2
8	Canopy Layers	0	2	2	1	1	2	1	1	2	2	2	2
9	Stand Age – Overstory	11	41	74	75	93	72	99	116	139	95	114	132	150
10	Stand Age – Dominant Story	13	30	59	78	98	55	88	116	143	90	114	125	148
11	Stand Age	13	30	60	80	109	55	89	118	149	91	121	128	152
12	Stand Age/10	2	3	6	8	11	6	9	12	15	10	13	13	16
13	Total Plot/Activity Count	46	42	74	131	150	159	893	1124	609	140	175	2847	1322
14	Treatment Plot/Activity Count	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Proportion Stockable Area	0.92	0.96	0.87	0.90	0.85	0.99	0.99	0.99	0.99	0.92	0.89	0.99	1.00
16														
17	**Stand-Stock Variables:**													
18	Seedlings/Acre < 1.0" diameter	201	352	186	170	118	340	122	66	26	352	126	66	41
19	Trees/Acre = 1.0"+ diameter	64	280	182	114	97	892	504	264	148	184	130	315	242
20	Basal Area/Acre = 1.0"+ diameter	12	35	43	53	76	105	129	149	161	62	78	151	157
21	Quadratic Mean Diameter – Trees = 1.0"+ diameter	6.0	4.9	6.7	9.7	14.4	4.9	7.0	10.8	15.7	8.0	10.8	9.9	11.5
22	Quadratic Mean Diameter – Top 20 percent, diameter	0.0	8.9	10.6	15.1	21.0	8.8	11.9	16.8	24.4	15.7	19.3	17.6	21.7
23	Stand Density Index	11	71	80	89	105	213	240	243	223	102	112	247	233
24	Stand Density Index – SDI_Dj (Zeide)	33	97	129	129	165	263	274	270	256	149	171	282	272
25	Stand Density Index – SDI_Dq (Reineke)	25	76	111	113	135	216	242	245	226	119	137	248	234
26	Canopy Cover Percent	6	22	23	22	22	51	51	47	40	24	24	48	44
27														
28	Live – Cubic Feet/Acre = 5.0"+ diameter	163	390	499	808	1969	1294	1812	2690	4215	993	1803	2811	3534
29	Live – Board Feet/Acre = 9.0"+ diameter	695	1659	1511	3348	11170	6102	6537	12093	23923	3952	9903	12939	19150
30	Harvest – Cubic Feet/Acre = 5.0"+ diameter	0	0	0	0	0	0	0	0	0	0	0	0	0
31	Harvest – Board Feet/Acre = 9.0"+ diameter	0	0	0	0	0	0	0	0	0	0	0	0	0
32	Growth – Cubic Feet/Acre/Year = 5.0"+ diameter	1.0	13.4	12.2	11.6	21.0	33.4	37.7	46.5	37.2	14.6	21.1	40.2	34.4
33	Mortality - Cubic Feet/Acre/Year = 5.0"+ diameter	0.2	6.0	6.0	5.0	26.9	13.9	15.6	19.6	26.5	14.0	34.9	19.4	22.5

Legend:
- Natural Succession
- Succession with Time Since Disturbance
- Non-lethal fire; or Thin and / or Rx Burn
- Initiate Regeneration through Site Preparation and / or Planting
- Regeneration Harvest
- Group Selection
- Uneven-aged Silviculture
- **Stand Replacing Fire**
- **Mixed Severity Fire**
- Insect and Disease

A. (GFB/SHR) Characteristic
B. Seed/Sap_Open (SSO)
C. Small_Open (SMO)
D. Medium_Open_Single (MOS)
E. V. Large_Open_Single (VOS)
F. Seed/Sap_Closed (SSC)
G. Small_Closed (SMC)
H. Medium_Closed_Single (MCS)
I. V. Large_Closed_Single (VCS)
J. Medium_Open_Multi (MOM)
K. V. Large_Open_Multi (VOM)
L. Medium_Closed_Multi (MCM)
M. V. Large_Closed_Multi (VCM)
N. (GFB/SHR) Not characteristic

Carbon assessments for Forest Planning

Regional Assessments

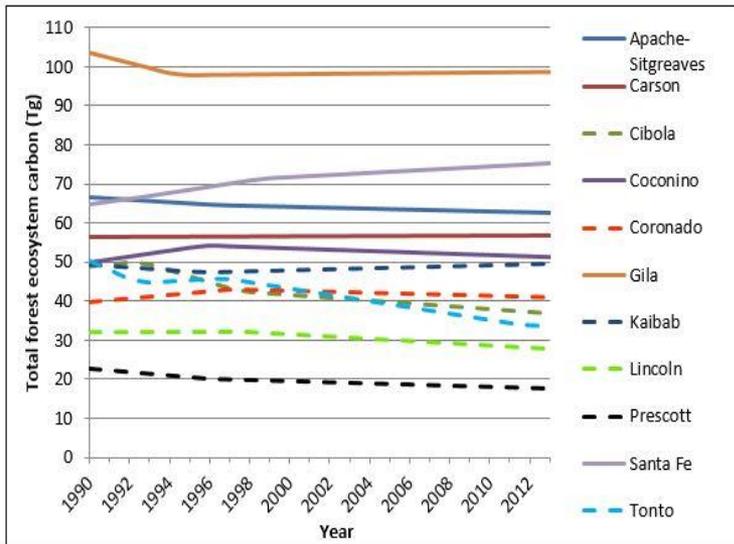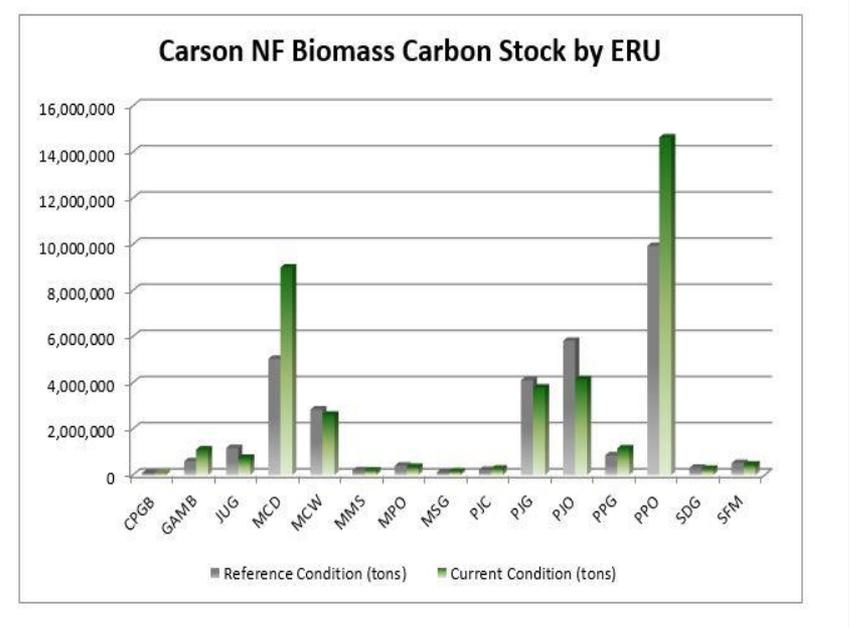

Figure 4A. Total forest ecosystem carbon (Tg) for the national forests in the Southwestern Region from 1990 to 2013.

Baseline Estimates of Carbon Stocks in Forested and Harvested Wood Products for National Forest System Units :Southwestern Region. 2015. Climate Change Advisors .Office of the Chief. USDA Forest Service, Washington DC.

Forest Assessments

Baseline Carbon Assessment Carson National Forest. 2016. USDA Forest Service, Carson NF, Taos, NM

NFS Challenges and Future Direction

- Timely data delivery for analysis and planning.

- All lands (forest/nonforest) approach is needed especially for nonforest carbon assessments.

USDA
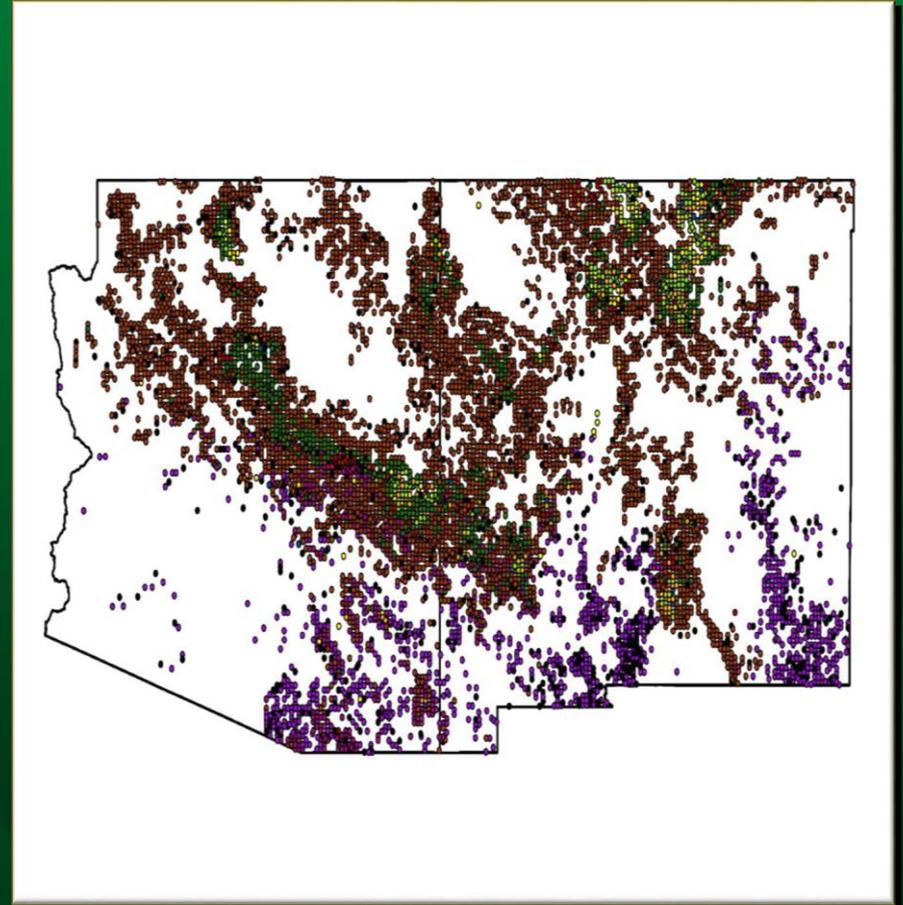
2012 Planning Rule

Requires two levels of monitoring

- **Broad-level monitoring** strategy (BSMS)

- **Plan-level monitoring** program
  - Coordinated and integrated with relevant broader-level monitoring strategies to:
    - *ensure the monitoring is **complimentary and efficient**,*
    - *and that information is gathered at **scales appropriate to the monitoring question***

- Scope and scale of questions at discretion of responsible official after considering:
  - *information needs most critical for management*
  - *financial and technical capabilities*

  [36 CFR 219.5 (a)(3); 219.12; 219.12(a)(4)]

USDA

Region 1, BSMS:

- FIA data is cornerstone of vegetation monitoring

Monitoring Question	Indicator	Measurement	Scale	Data Source
MON-VEG-02 What is the quantity of R1 Cover Types? Ponderosa pine • dry douglas fir • mixed mesic conifer • western larch mixed conifer • lodgepole, • aspen/hardwood	**IND-VEG-02** R1 Cover type	R1 Cover Types	• By Region • By admin Forest/Grassland each • By R1 Broad PVT for Region • By Forest/Grassland	FIA

Monitoring Question	Indicator	Measurement	Scale	Data Source
MON-VEG-05 What is quantity of old growth?	**IND-VEG-05** Old Growth as defined by Green et al old growth algorithm	acres of old growth as defined by Green et al	• By Region • By admin Forest/Grassland each • By R1 Broad PVT for Region • By Forest/Grassland *by R1 Broad PVT*	FIA

Region 1, Integration of Monitoring Levels

Proportions of R1 Cover Types in Region 1

- aspenhardwood
- drydouglasfir
- lodgepolepine
- mixedmesiccon
- none
- ponderosapine
- sprucefir
- whitebarksubalpi
- wlarchmixedcon
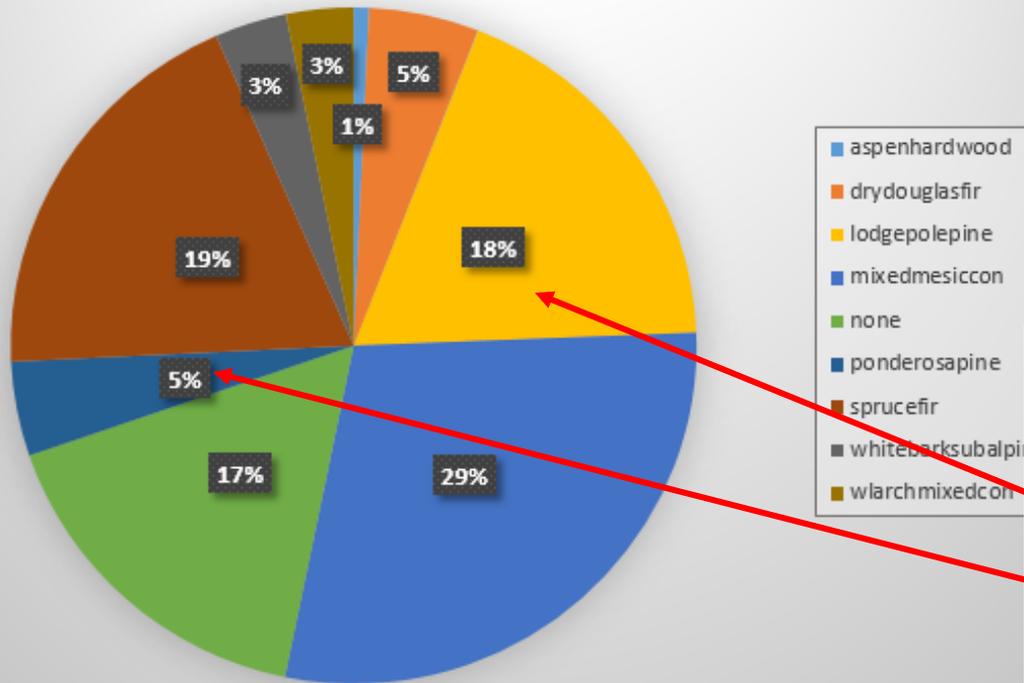
Helena-Lewis and Clark NF
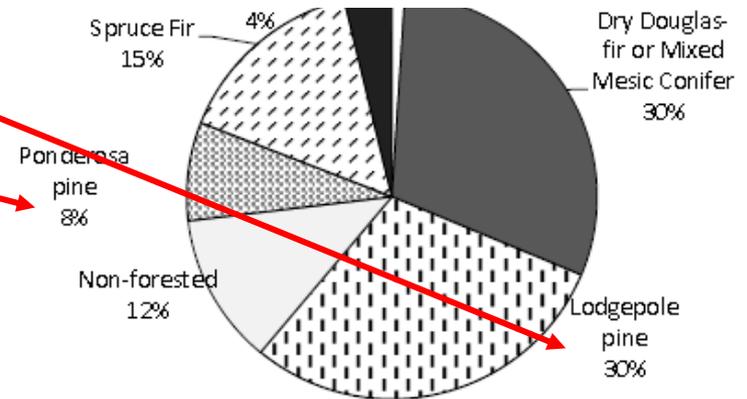
Region 1, Monitoring over time

Area	Snags per Acre 10"+			Snags per Acre 15"+			Snags per Acre 20"+			Total Number PSUs	Number Forested PSUs	Total Number subplots w/forested PVT
	Mean	90% CI - Lower Bound	90% CI - Upper Bound	Mean	90% CI - Lower Bound	90% CI - Upper Bound	Mean	90% CI - Lower Bound	90% CI - Upper Bound			
Eastern Montana	14.8	13.7	16.0	3.4	3.0	3.8	0.8	0.7	1.0	1534	1502	5244
Western Montana	14.6	13.6	15.7	4.4	4.0	4.8	1.4	1.2	1.6	1387	1349	5469
North Idaho	14.9	13.9	16.0	5.2								

Area	Trees per Acre 10"+			Tre...
	Mean	90% CI - Lower Bound	90% CI - Upper Bound	Mean
Eastern Montana	44.5	42.4	46.6	9.8
Western Montana	48.3	46.4	50.4	14.3
North Idaho	62.1	59.7	64.7	24.0

Snags Per Acre by Size Class Comparison - Western Montana Zone

Region 1 Monitoring – not just about trees

- Using Cover by Lifeform to determine predominate lifeform

Table 2.19 Proportion of life forms on the HLC NFs, R1 Summary Database Base FIA plots

Lifeform	% Area
Tree	87.7
Shrub	4.89
Grass	1.60
Forb	1.85
Sparse	2.82
Non-vegetated (rock, ice)	1.14

- Developing dominance type algorithms for shrubs, forbs, grasses

	1	2	3
Label	Parameter met – **Low Sagebrush–Black Sagebrush Dominance Type Group**; if not, go to 2	Parameters met – **Fringed Sagewort Dominance Type Group**; if not, go to 3	Both parameters met – go to 4; if not, go to 9
english	X – Individual absolute cover of _at least one of these species_ >=10%	Z – Individual absolute cover of every species marked with an Z >=10%	X – Individual absolute cover of _at least one of these species_ >=10%
condition		All Z >=	X >=
value	10	10	10
2nd Condition english	O – Individual absolute cover <10%	O – Individual absolute cover <10%	O – Individual absolute cover <10%
Operator	AND	AND	AND
2nd condition	O <	O <	O <
2nd condition value	10	10	10
TRUE	"Low Sagebrush–Black Sagebrush"	"Fringed Sagewort"	Go to 4
FALSE	2	3	9
	1	2	3
SCIENTIFIC NAME			
Artemisia arbuscula	X	w	w
Artemisia nova	X	w	w
Artemisia frigida	O	Z	w
Artemisia tridentata	O	O	X

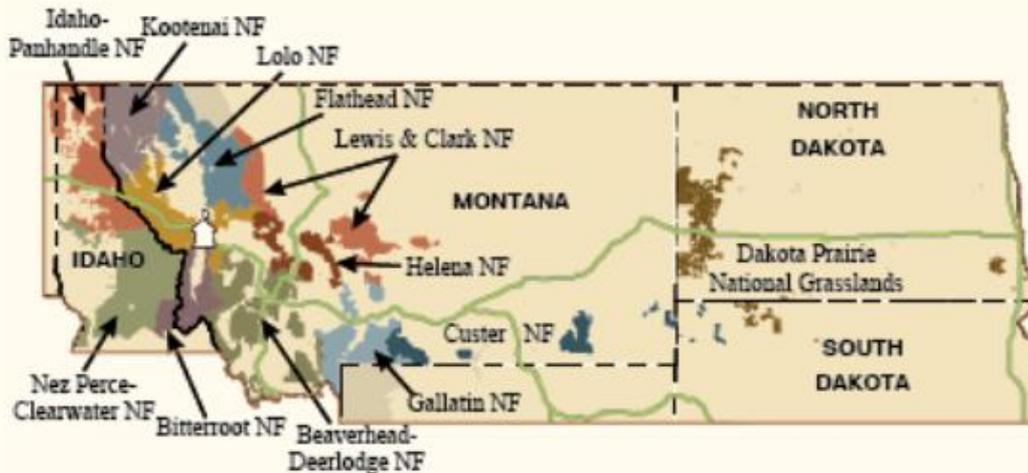# Region 1 challenges

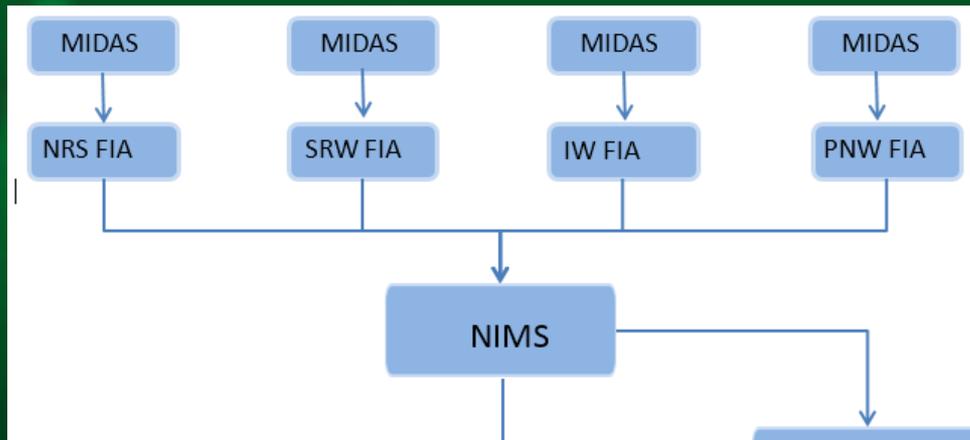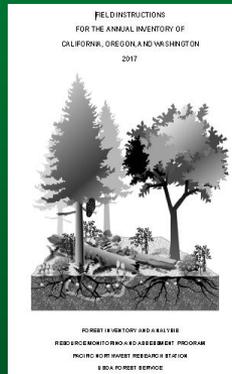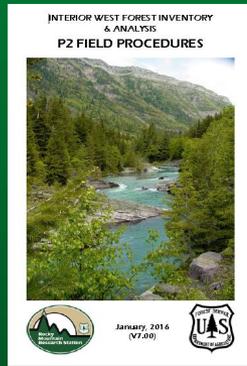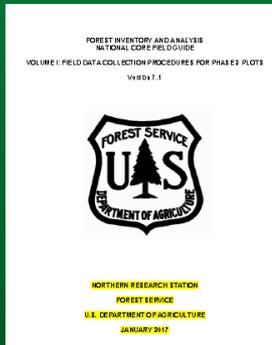- R1 administrative lands cross 3 FIA units: IW, NO, PNW
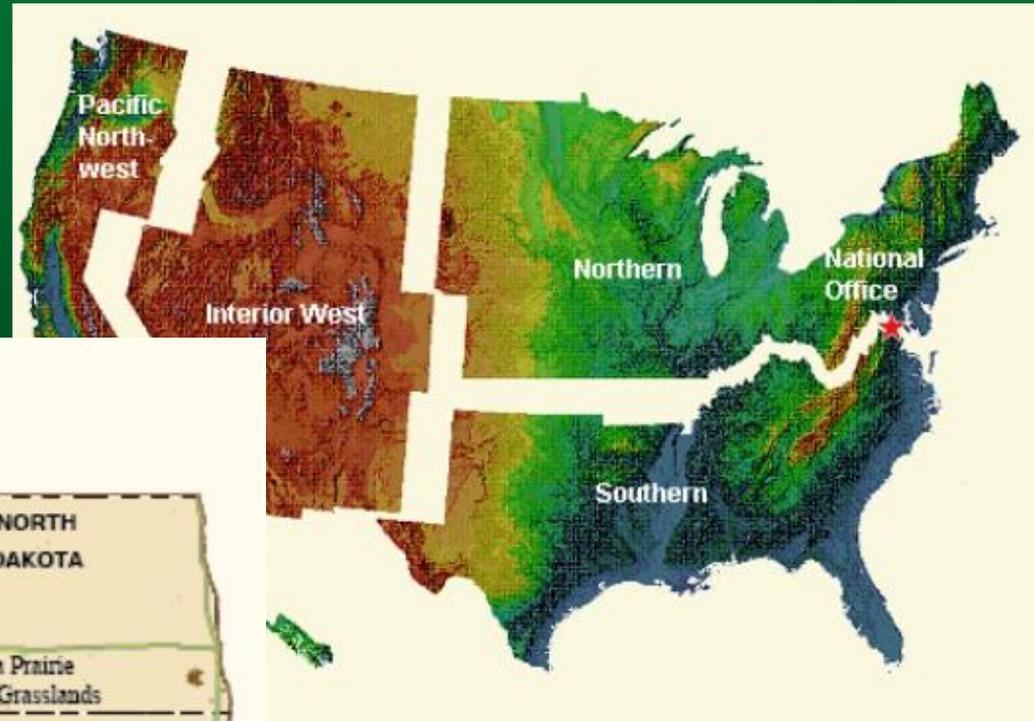
Region 1 challenges:
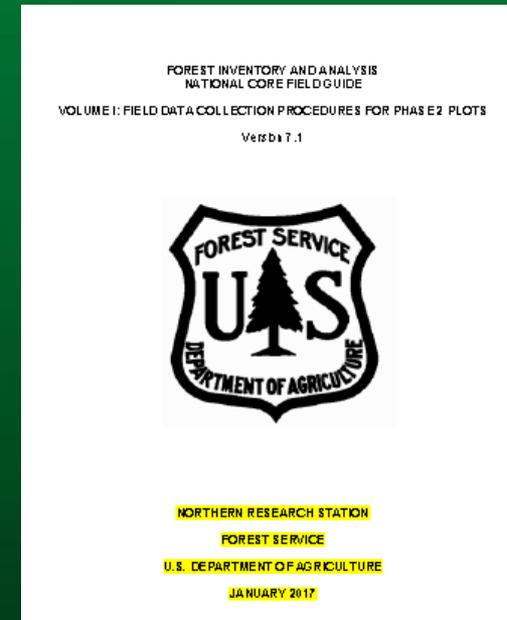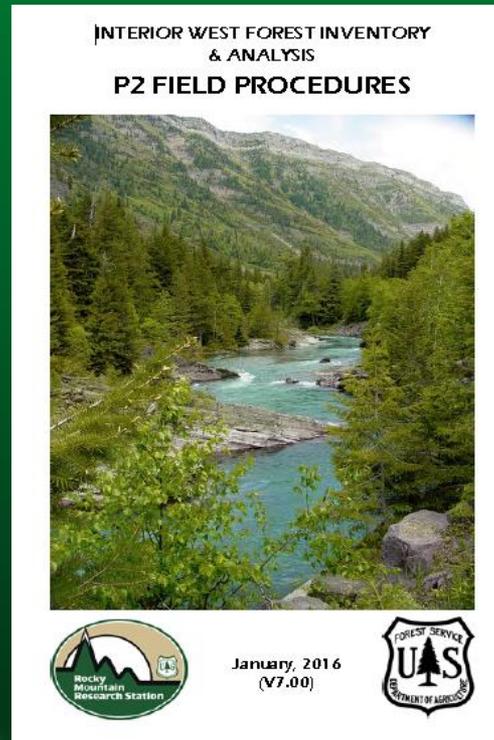
Region 1 challenges:

- Service Agreement has IW-FIA collecting data on all plots in R1 administrative boundary that is "forested"

- R1 is paying to have IW collected data on all non-forested plots ND and SD

- Working with FIA to come up with "single plot" but…we will see

THANK YOU