

Rapid Habitat Assessment:

Assessing site suitability and detecting habitat change for a federally endangered species

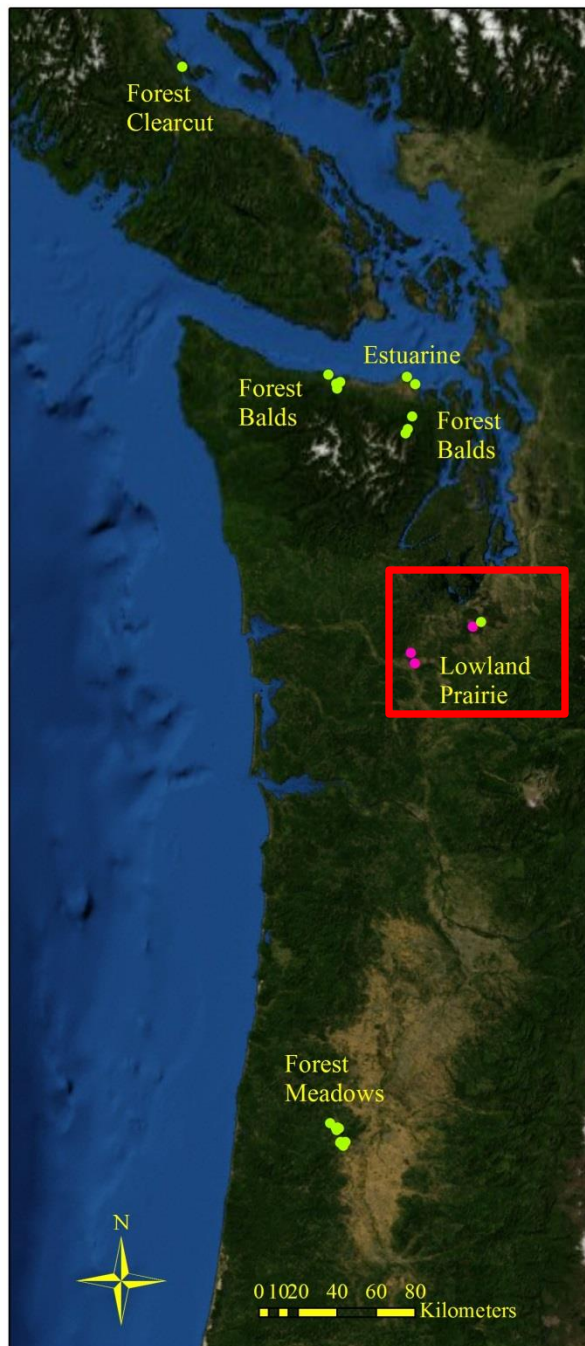
*Mary Linders
Washington Department of
Fish and Wildlife*

Unrestored

Habitat

Restored





Taylor's Checkerspot Extant Locations

Updated January 2014



Legend

- Wild Sites
- Reintroduction Sites



Taylor's checkerspot



- *Federally endangered*
- *Dramatic population declines*
- *Habitat loss and degradation*
- *Six populations lost 1996-2006*
- *One extant Puget lowland population*

Range 76 - Extant
Artillery Impact Area
Joint Base Lewis-McChord



Range 76 - Extant
Artillery Impact Area
Joint Base Lewis-McChord



Range 50 – recent extirpation



Goal and Objectives

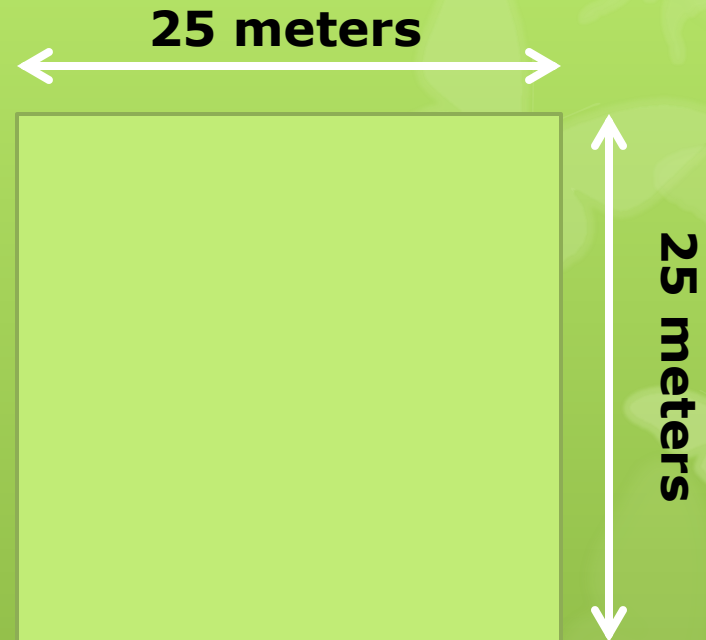
GOAL: Quantify known habitat characteristics to increase the scientific basis of habitat enhancement planning and the determination of site readiness for checkerspot reintroduction

OBJECTIVES:

- 1) Evaluate habitat status and restoration need
- 2) Determine readiness for reintroduction
- 3) Use spatially explicit data to inform management planning on occupied and potential future reintroduction sites

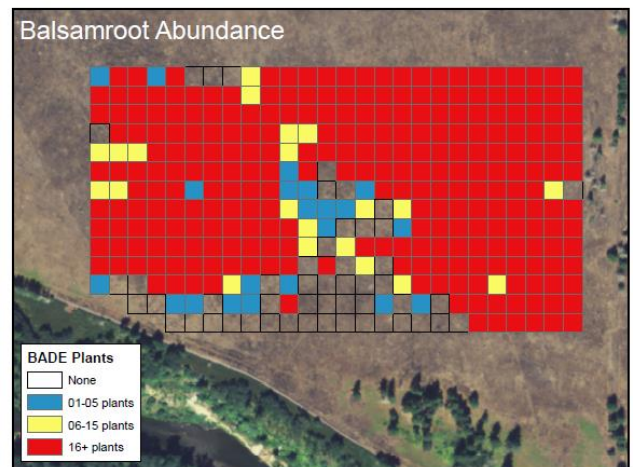
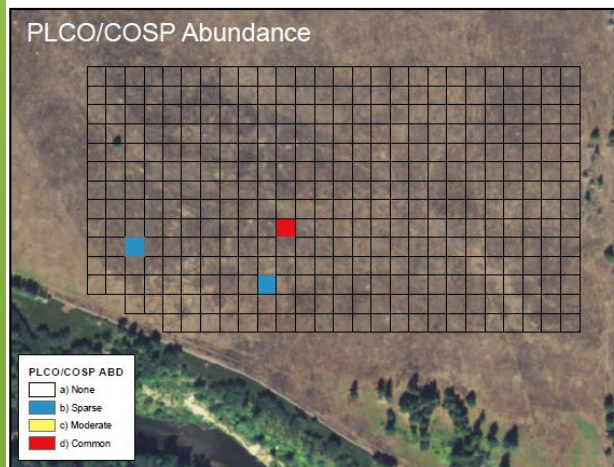
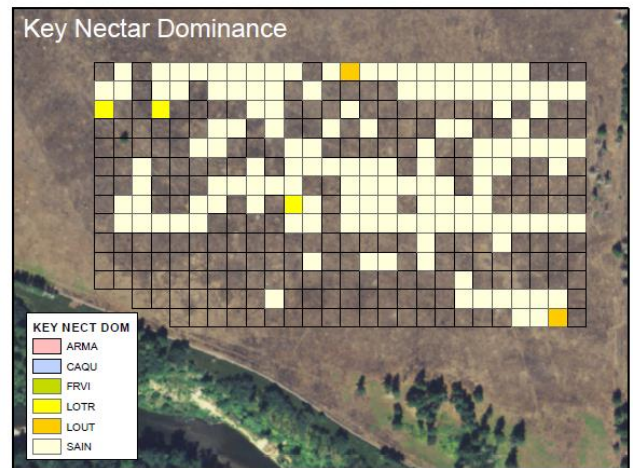
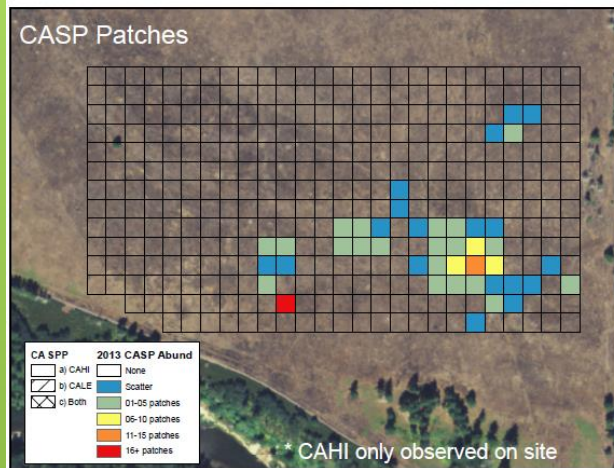
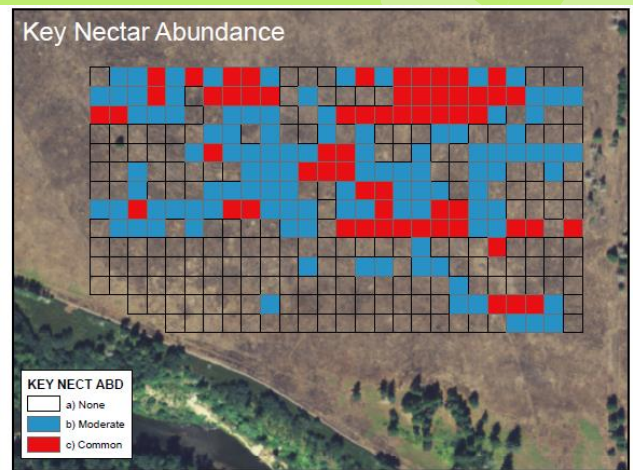
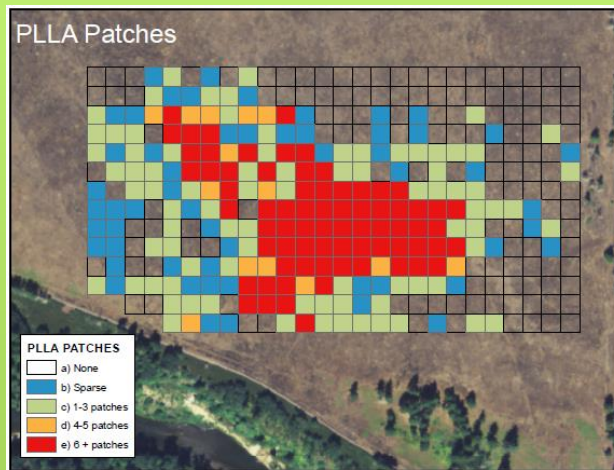
Habitat Assessment Methods

Checkerspot Resources
Plantago patches
C. hispida/C. levisecta patches
Castilleja species
Plectritis congesta/Collinsia spp
Balsamorhiza deltoidea
Key nectar
Key nectar spp
Key nectar spp dominant
Structural Characteristics
Exotic shrubs >1ft
Ground level % cover
Invasive Exotics
Tall oatgrass
Other exotic grass
Other exotic grass spp
Exotic forb
Exotic forb spp
Other Variables of Interest
Native grass



- 625-sq m grid
- Same grid used for checkerspot surveys
- 3 consistent observers

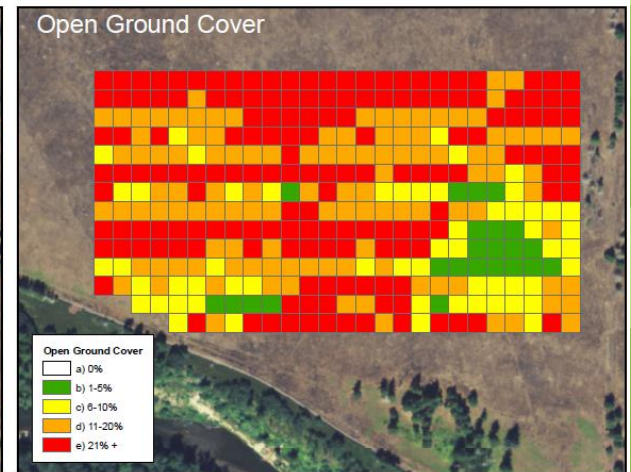
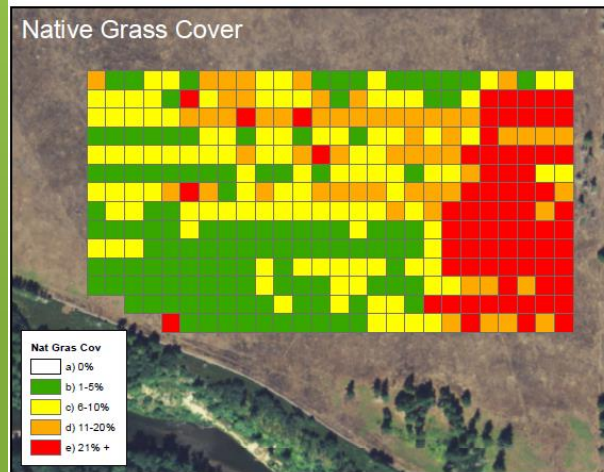
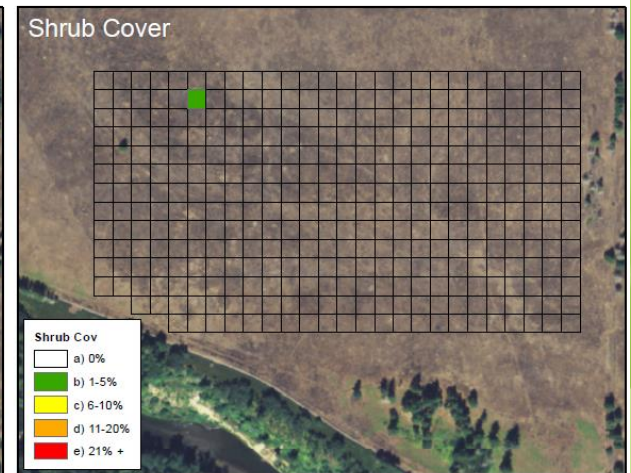
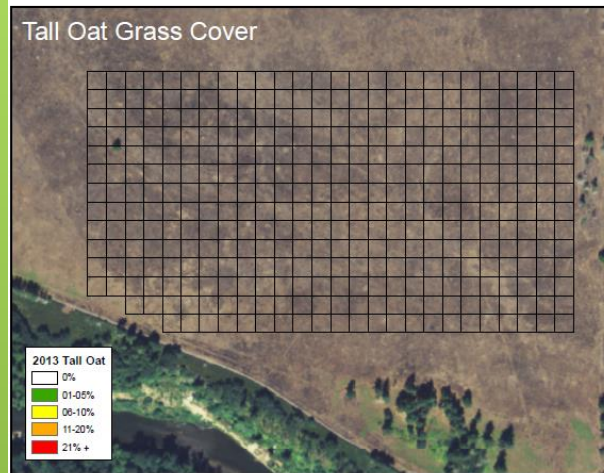
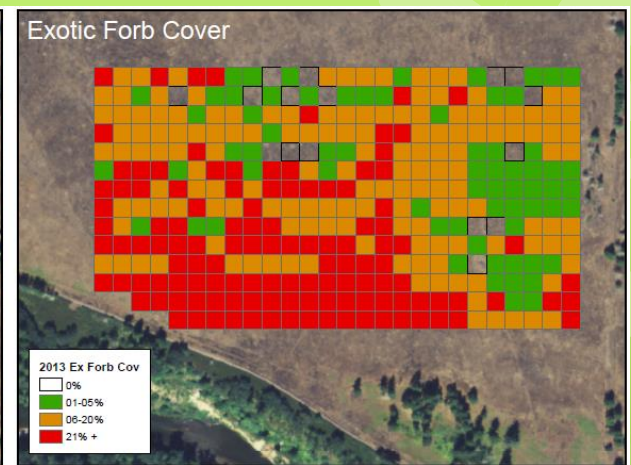
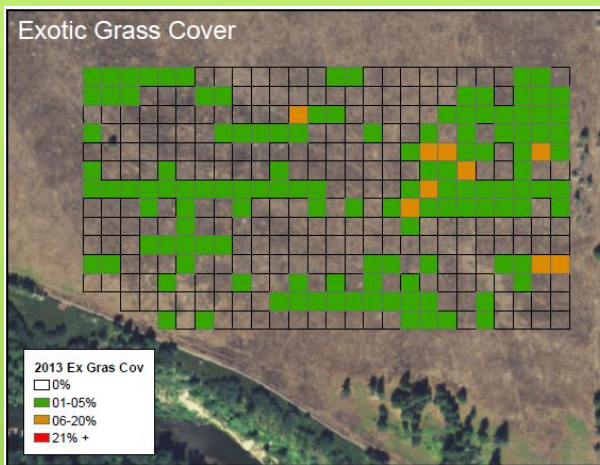
RANGE 50 Checkerspot Resources





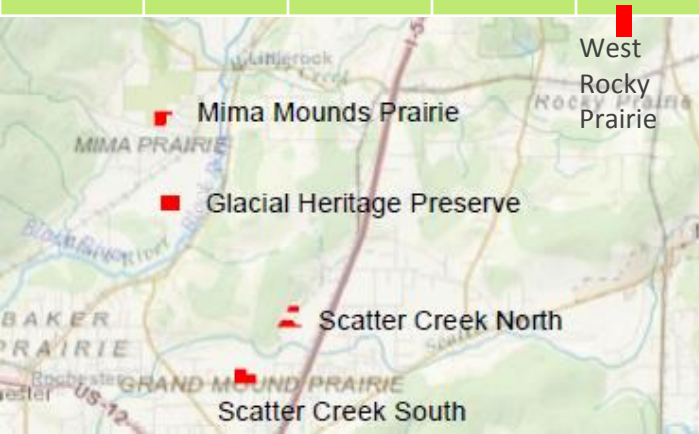
RANGE 50

Habitat structure and Invasive exotics



Sites surveyed 2013-2015

The map displays the Lewis and Clark National Historic Trail area in Washington. Key locations marked with red squares include Johnson Prairie, Tenalquot Prairie, Range 50, Range 76, Training Area 7S, and Training Area 15. The map also shows major roads like I-5 and I-90, and various lakes and rivers. The trail is highlighted in red, and the survey sites are marked with red squares. The map includes labels for Anderson Island, Florence Lake, American Lake, Spanaway Lake, and several prairie areas like Johnson Prairie, Tenalquot Prairie, Smith Prairie, and Ruth Prairie. It also shows the Nisqually River, Yelm River, and Deschutes River. Major cities like East Olympia, Yelm, and Spanaway are labeled. The map is titled 'Sites surveyed 2013-2015'.



Methods

2014	Abundance class					
Habitat Variable	0	1	2	3	4	5
Checkerspot Resources						
Plantago patches	None	Sparse	1 to 3	4 to 5	6 or more	
C. hispida/C. levisecta patches	None	Sparse	1 to 3	4 to 6	7 or more	
Castilleja species	CAHI	CALE	BOTH			
Plectritis congesta/Collinsia spp	None	Sparse	Moderate	Common		
Balsamorhiza deltoidea	None	1-5	6-15	>15		
Key nectar	None	Moderate	Common			
Key nectar spp	ARMA	CAQU	FRVI	LOTR	LOUT	SAIN
Key nectar spp dominant	ARMA	CAQU	FRVI	LOTR	LOUT	SAIN
Structural Characteristics						
Exotic shrubs >1ft	0%	1-5%	6-10%	11-20%	>20%	
Ground level % cover	0%	1-5%	6-10%	11-20%	>20%	
Invasive Exotics						
Tall oatgrass	0%	1-5%	6-10%	11-20%	>20%	< 0.5%
Other exotic grass	0%	1-5%	6-10%	11-20%	>20%	
Other exotic grass spp	AGSP	ANAR	ANOD	HOLA	POPR	Other
Exotic forb	0%	1-5%	6-10%	11-20%	>20%	
Exotic forb spp	HYRA	LEVU	RUAC	TENU	Other	
Other Variables of Interest						
Native grass	0%	1-5%	6-10%	11-20%	>20%	

Habitat Assessment Criteria

Habitat Assessment Criteria		Reintroduction Readiness: 5-acre scale		50-ac scale
Variable	Unit Definition	Release Area	Source/Justification	Release Site
Unit size (ha)	NA	2 ha, includes release plots	Adult area following larval release (Linders, unpub. data)	20 ha area managed for checkerspots
Unit definition	NA	32 connected cells; mainly Larval, Adult or Structural cells	Habitat connectivity important for population establishment and cohesion	325 connected cells; mainly Larval, Adult or Structural to support a population
Timeline	Year of reintroduction	Spring prior	Habitat ready before release	7
Resource Objectives		Minimum # cells		Minimum %(#) cells
#Larval, Adult, or Structural	Structural: Shrub ≤5% AND OpenGrd >5%	27	% at Range 76	83 (269)
Total #Larval	Larval: (≥1 patch PLLA OR CAHI/CALE) AND Shrub ≤5% AND OpenGrd >5%	≥15	% at Range 76	47 (152)
#Larval w/>5 PLLA patches	#Larval cells w/ >5 PLLA patches	9	Host concentration increases survival in release areas	20 (65)
3 adjacent Larval w/>5 patches PLLA	3 adjacent Larval cells with >5 patches PLLA	3	Host concentration increases population cohesion	NA
#Larval w/≥1 patch ea PLLA AND CAHI/CALE		?	Want a diversified approach; no basis for defining	?
Total #Adult	Adult: (≥1 BADE OR Key Nec ≥ Mod) AND Shrub ≤5% AND OpenGrd >5%	20	63% cells (R76); want "nectar patches in and around host/release plots"	63 (205)
#Adult w/BADE	Diversity; any combination	Total of 10 cells	Most-used spp (Linders 2014); increases productivity (Murphy et al. 1989)	50
#Adult w/LOTR				
#Adult w/KeyNec	Diversity	10 cells	50% of Adult (random)	32 (104)
#Adult w/≥16 BADE	Density; any combination	Total of 9 cells	Concentrated nectar aggregates adults	45
#Adult w/KeyNec Common				

5-ac Assessment Units

Hypothetical example of mapped results of restoration target assessment.

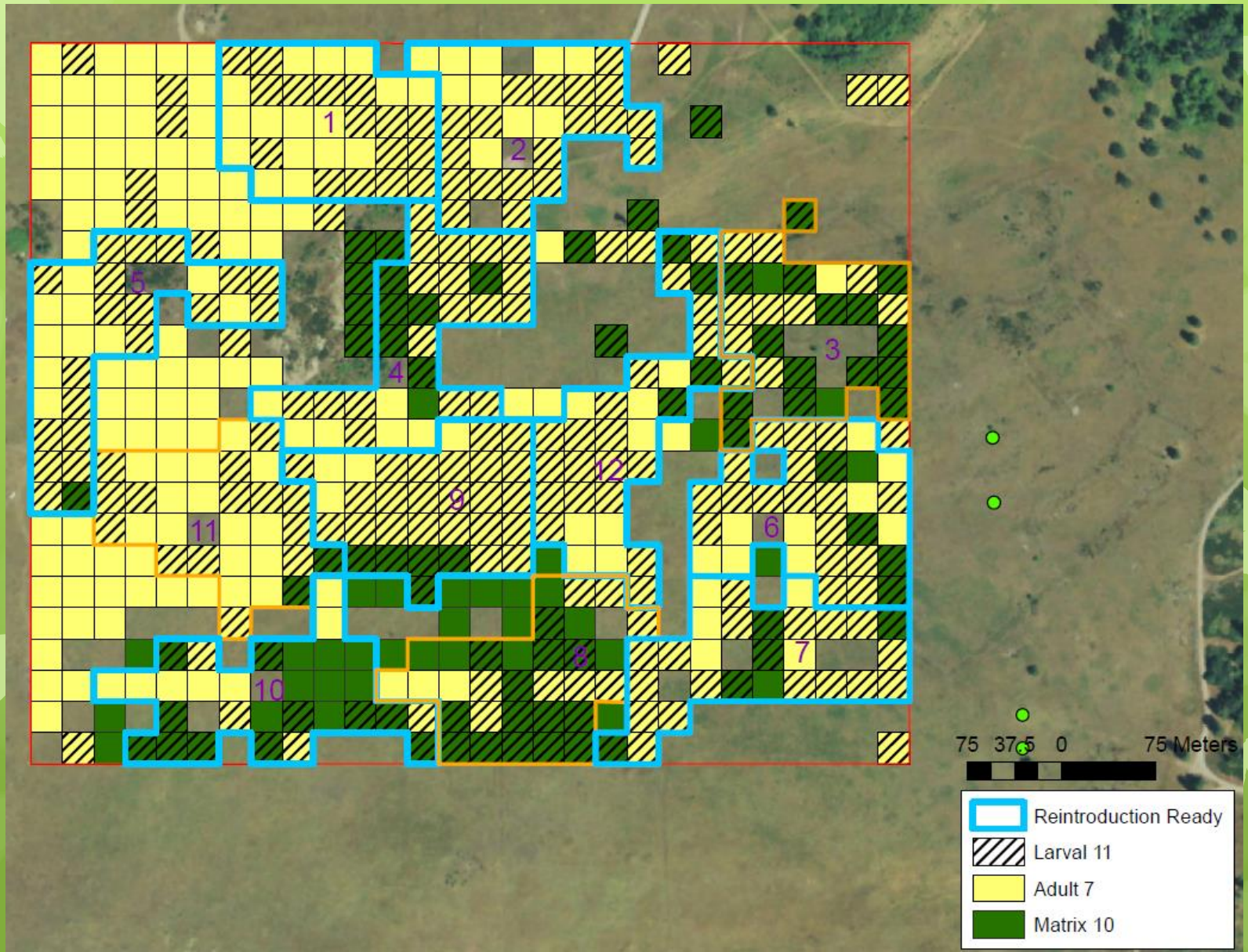
Five acres is 32 cells.

5-ACRE UNIT

Release/enhance

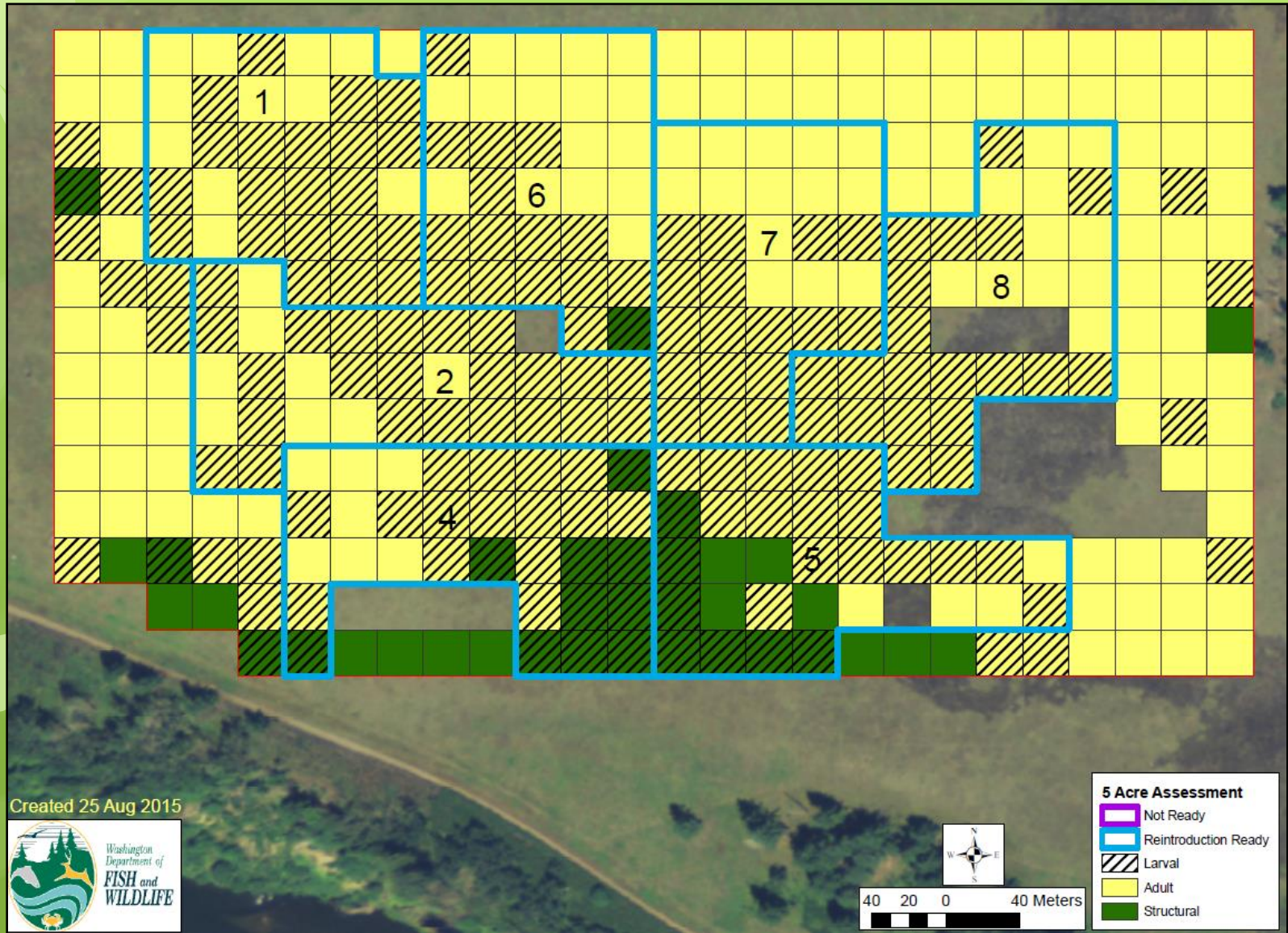
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5-ac Assessment Units

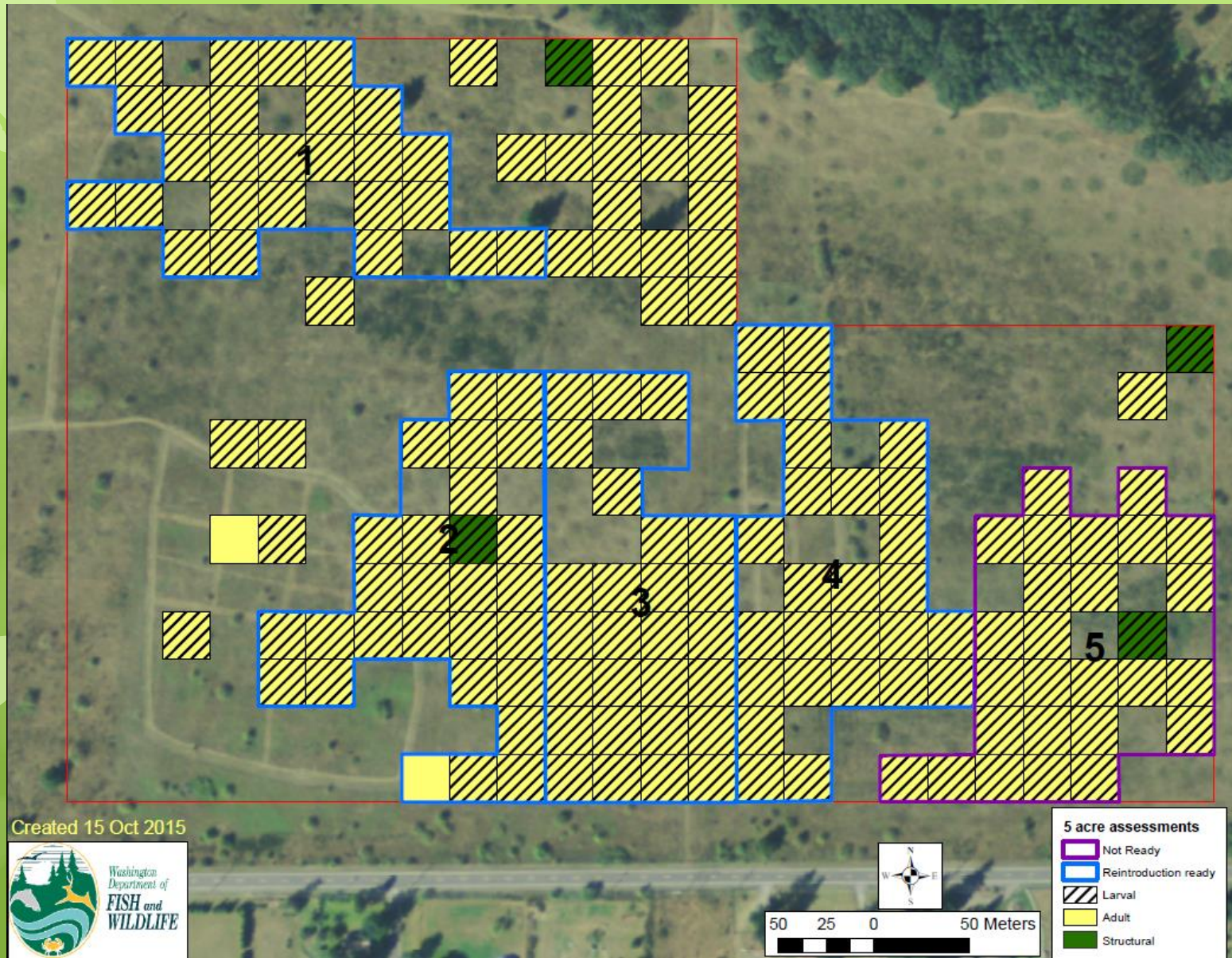


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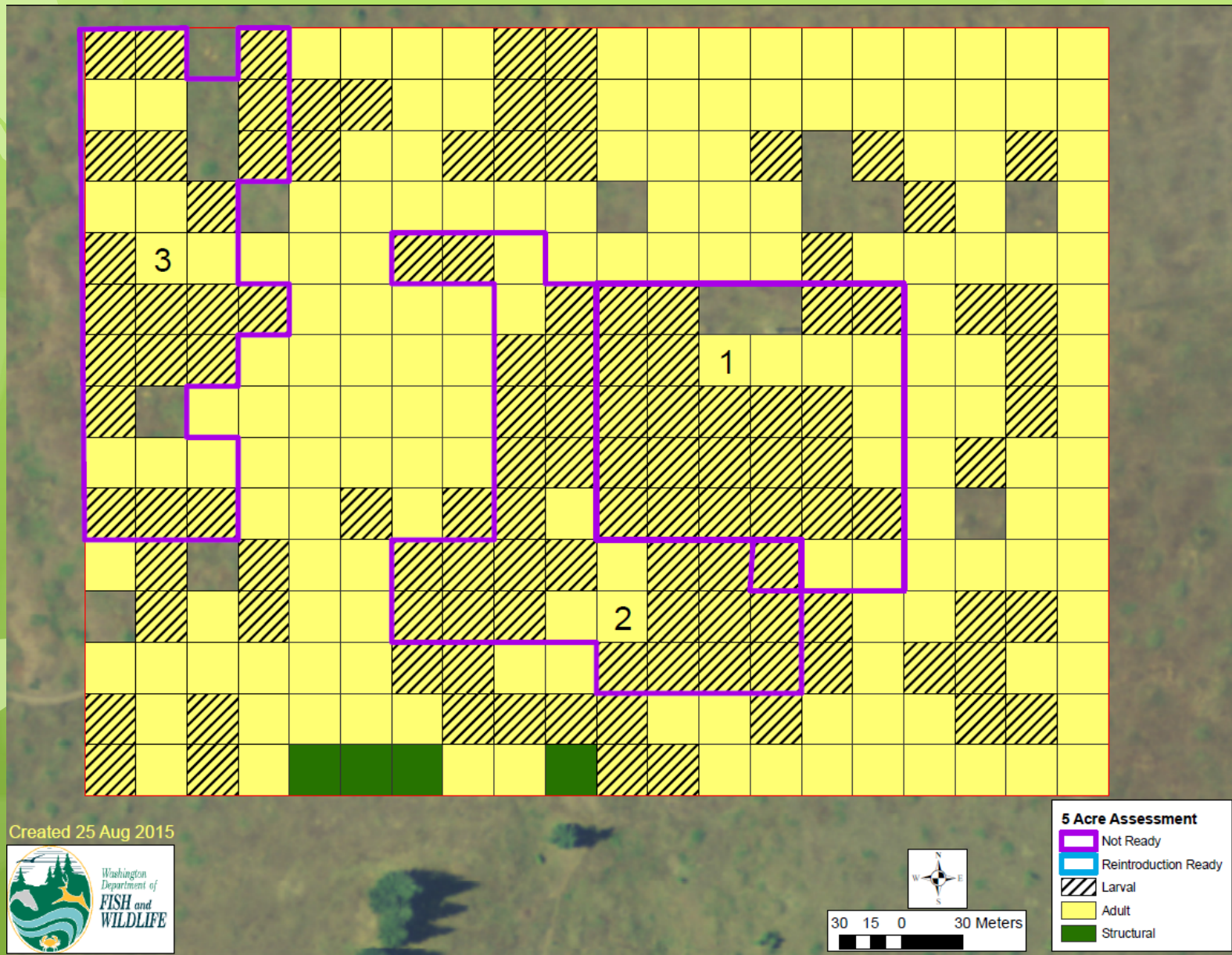
Range 50: 5-ac habitat assessment units



SCS: 5-ac habitat assessment units



GHP: 5-ac habitat assessment units

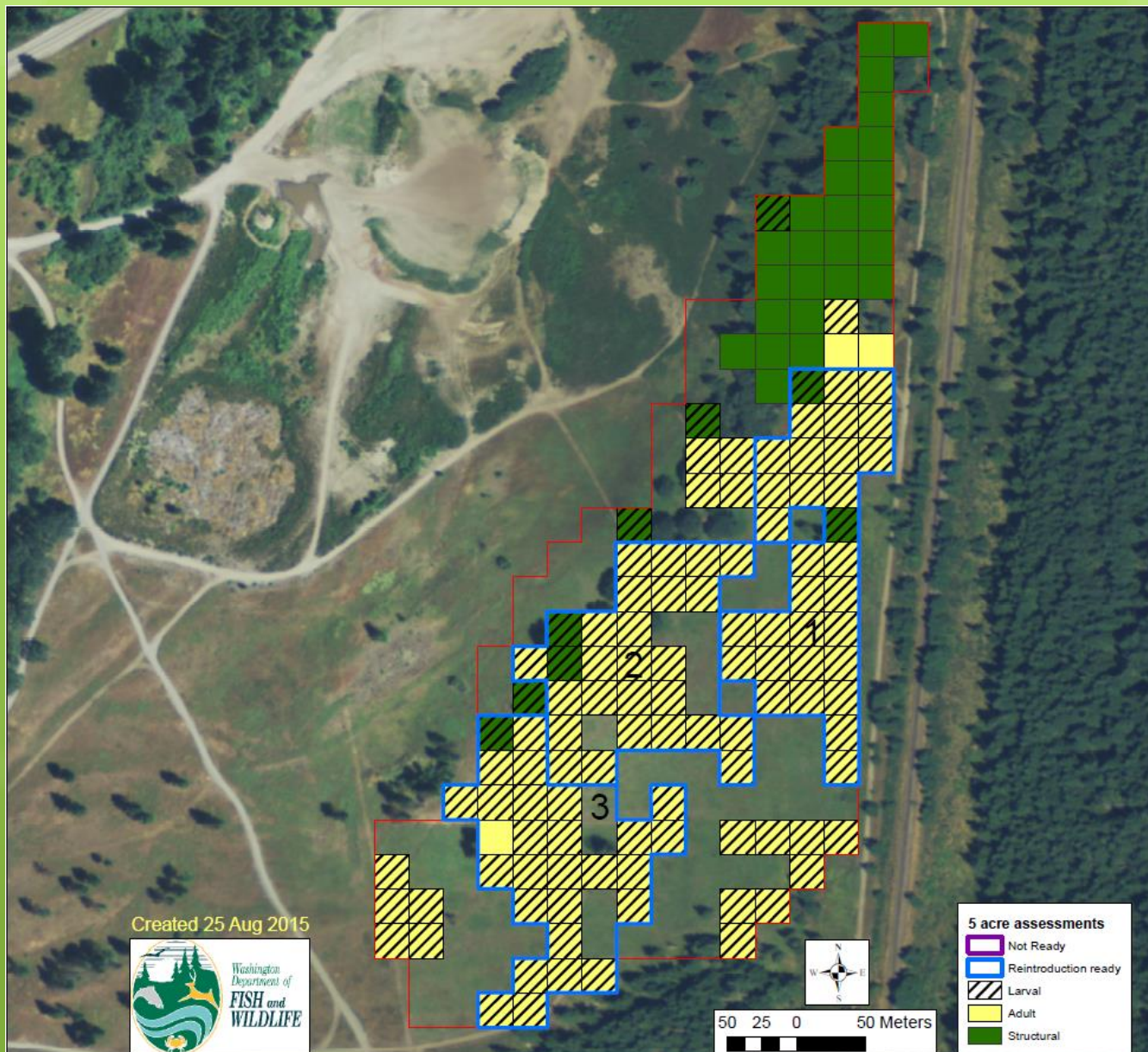


5-ac Habitat Assessment

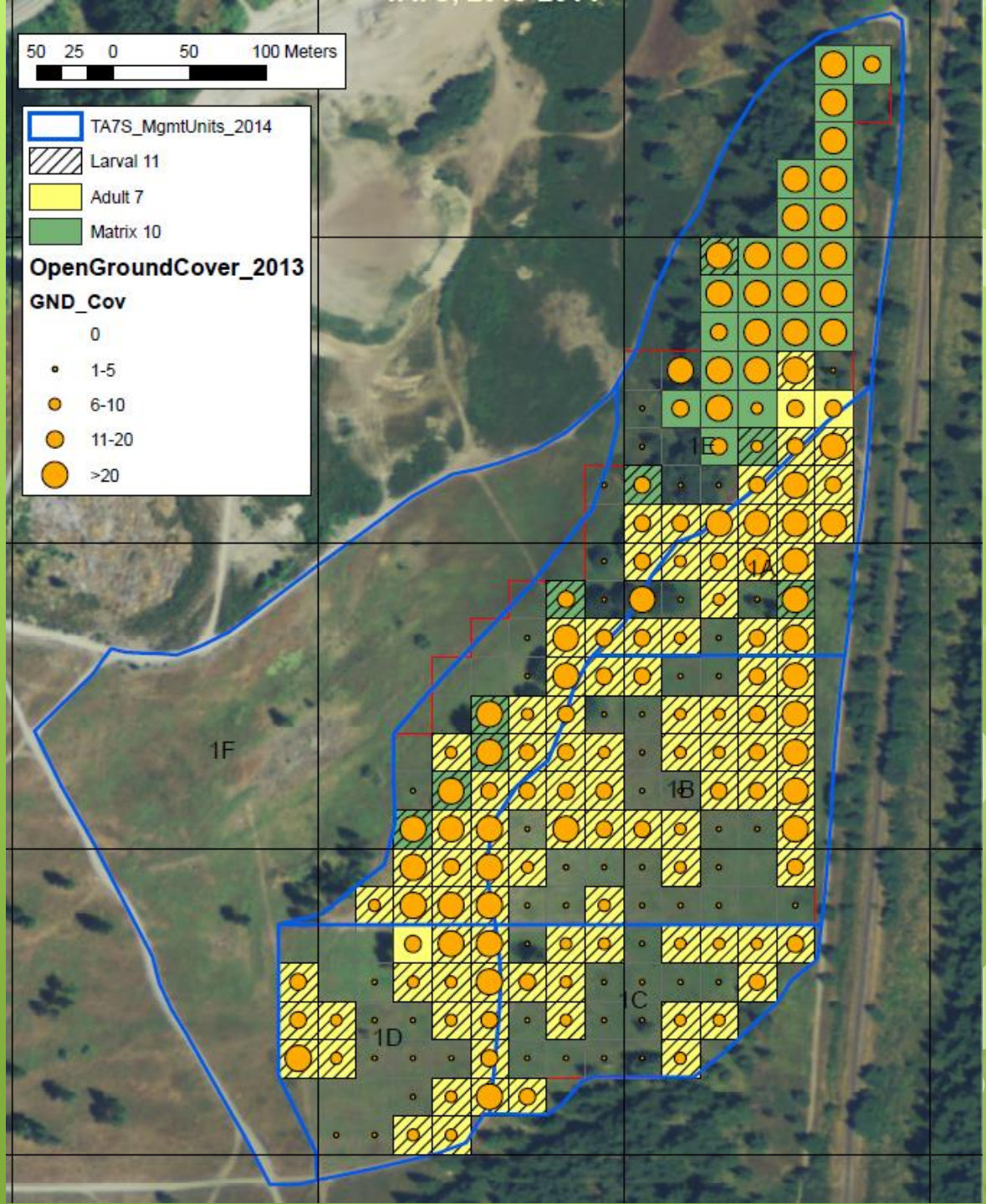
Reintroduction Readiness Assessment 5-acre (32-cell) blocks

Resource Objectives	# cells needed											
Site		GHP	GHP	GHP	PCM	PCM	PCM	SCS	SCS	SCS	SCS	SCS
Criteria		1	2	3	1	2	3	1	2	3	4	5
#Larval, Adult or Structural	27	30	32	29	27	32	31	27	28	27	32	27
Total #Larval	15	22	26	20	27	30	30	27	27	27	32	27
#Larval w/>5 PLLA patches	9	9	7	10	25	26	26	20	19	24	25	15
3 adjacent Larval w/>5 patches of PLLA	3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
#Larval w/≥1 patch ea PLLA AND CAHI	??	13	10	0	25	18	26	7	3	0	3	0
Total #Adult	20	30	32	29	20	20	23	27	27	27	27	26
#Adult w/ BADE	10 total	0	5	3	9	11	7	23	27	26	19	0
#Adult w/LOTR		0	4	5	19	18	22	14	19	25	15	0
#Adult w/other KeyNec	10	30	32	28	20	20	22	25	23	25	26	26
#Adult w/≥16 BADE	9 total	0	3	1	0	0	0	12	22	17	16	0
#Adult w/KeyNec Common		28	31	25	7	4	8	4	4	9	10	16
Reintroduction Ready?		No	No	No	No	No	No	Yes	Yes	Yes	Yes	No
Occupied in 2014?		Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No
Resilience Objectives												
Tall oatgrass ≤5%	24	32	32	22	32	32	32	18	19	21	23	24
Exotic grass ≤5%	30	21	28	5	24	25	23	25	32	32	32	30
Exotic forb ≤20%	21	29	21	6	30	32	30	24	30	29	20	27
Native grass >5%	18	17	13	17	12	12	23	7	18	17	8	16

TA7S: 5-ac habitat assessment units



TA7S Outstanding needs





Habitat re-assessed every 3 years
Restored sites will have five 5-ac
Reintroduction units + 25 ac

Taylor's checkerspot Habitat Restoration

Habitat assessment for site suitability:

- Uses measureable criteria to improve communication between project partners
- Improves outcomes thru consistent application of standards
- Improves transparency in decision-making and management actions
- Improves planning for future actions and assessment of ongoing management needs

Special thanks!

Funding Support:

JBLM-ACUB and JBLM Fish and Wildlife programs:
Dave Clouse, Jeff Foster

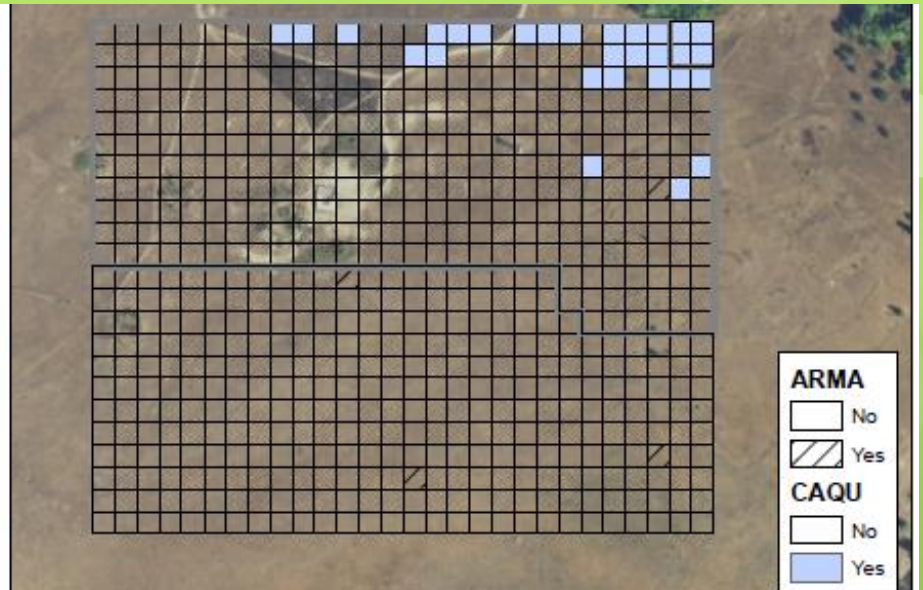
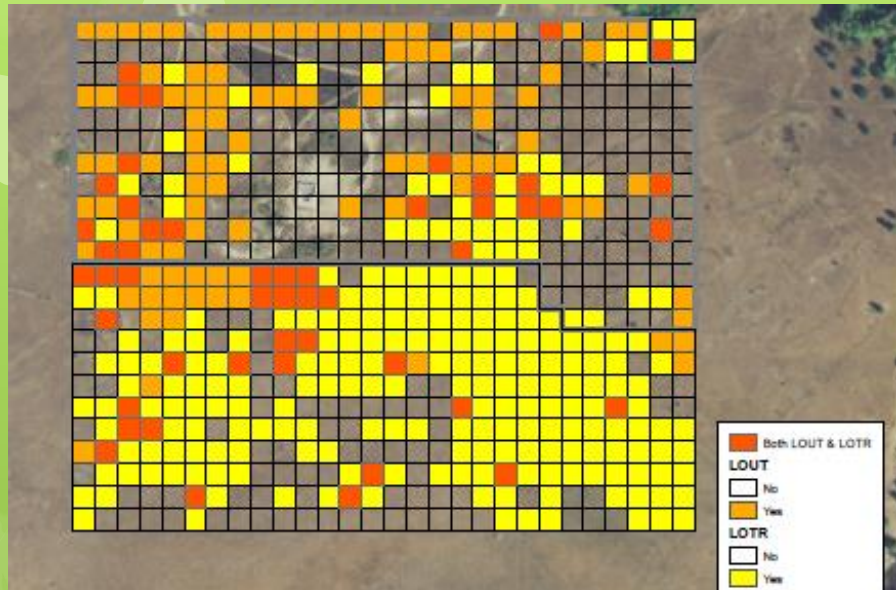
Technical support:

Peter Dunwiddie, Cheryl Fimbel, Sanders Freed,
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Ann Potter, Dave Wilderman

Field staff:

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Cook

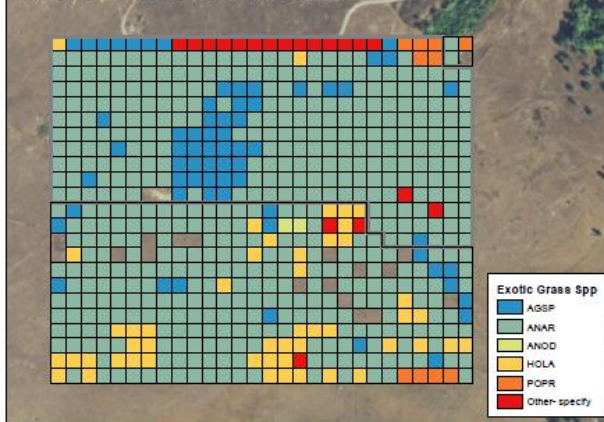
Questions?



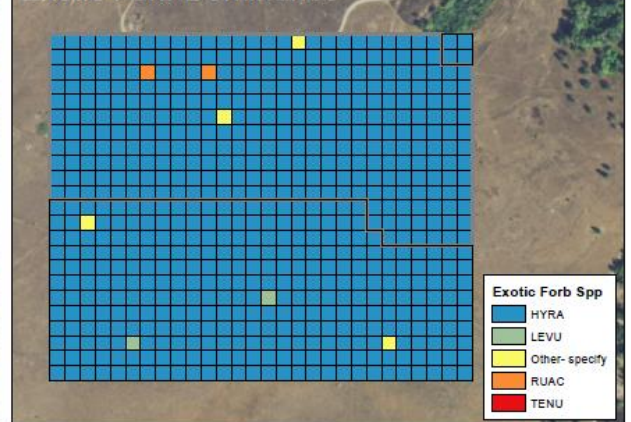
RANGE 76

Habitat structure and Invasive exotics

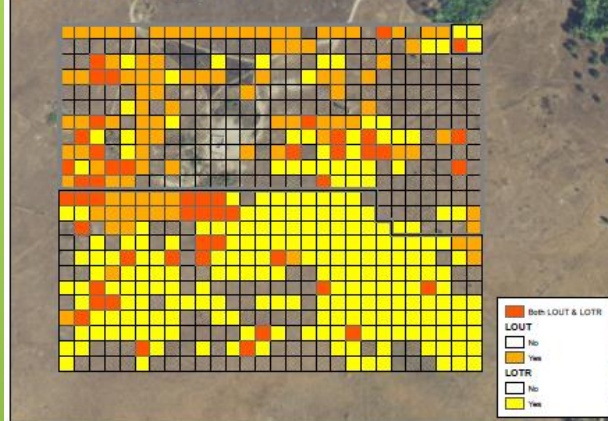
Exotic Grass Dominance



Exotic Forb Dominance



Lomatium Spp Presence



CAQU and ARMA Presence



FRVI Presence



SAIN Presence

