Effectiveness of Biocontrol with Tamarisk Beetles (*Diorhabda carinulata*)

Impacts on Tamarisk
In Grand County Utah 2004 – 2013

By

Wright Robinson

Support from:
Private Foundations
Forestry, Fire and State Lands 2012
A Utah NRCS Sponsored Research Project 2008-2011
National Park Service sponsor 2009 – 2010

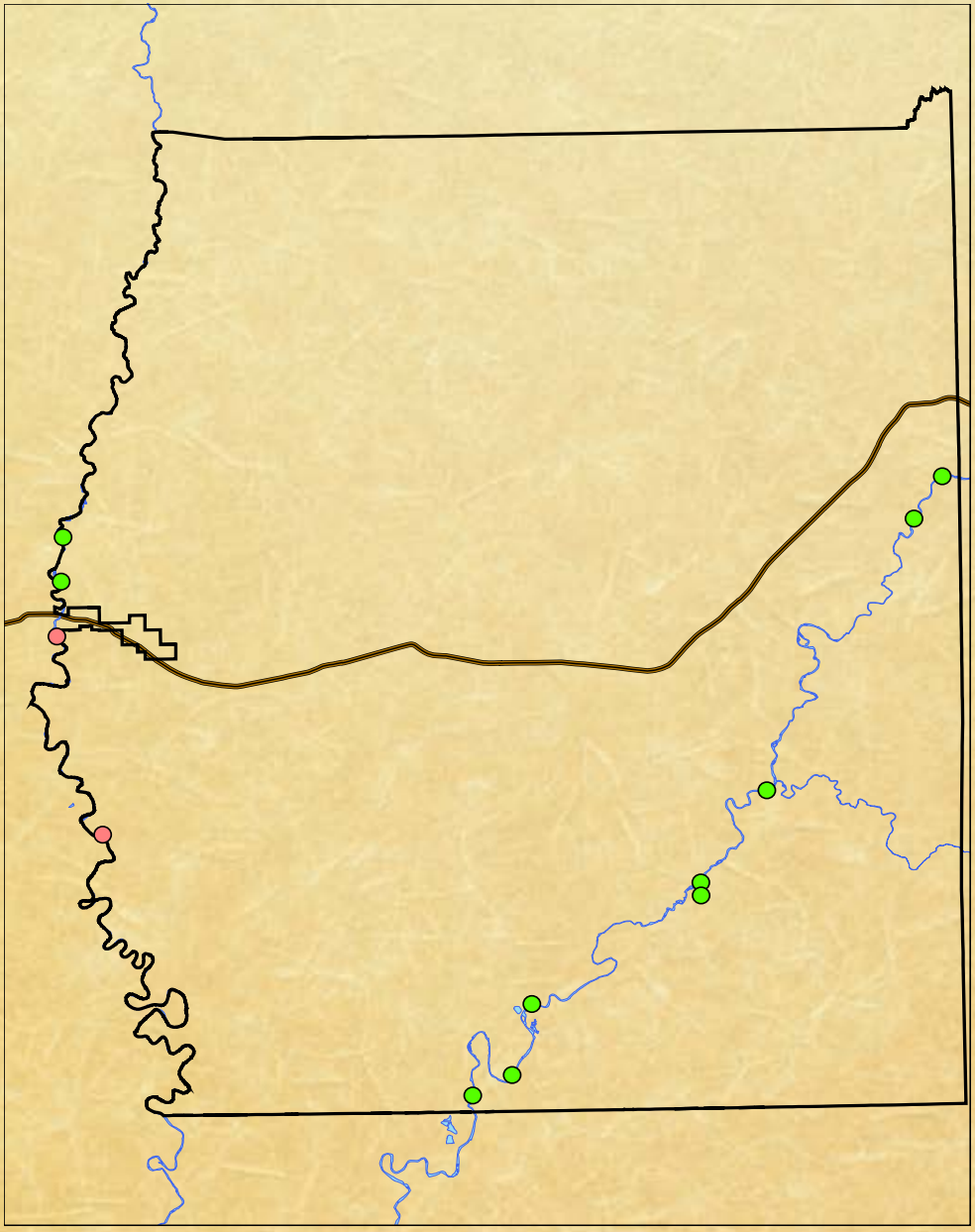
I.

Project Background

A few Facts

- 2004 Grand County, UT opts to use beetles to control tamarisks
- Release years: 2004, 2005, 2006
- Release numbers: about 10,000 adults each time
- Releases made/site: 1 to 3

Release Sites



2005 (< 2 ha)

Dave Vaughn, 2014

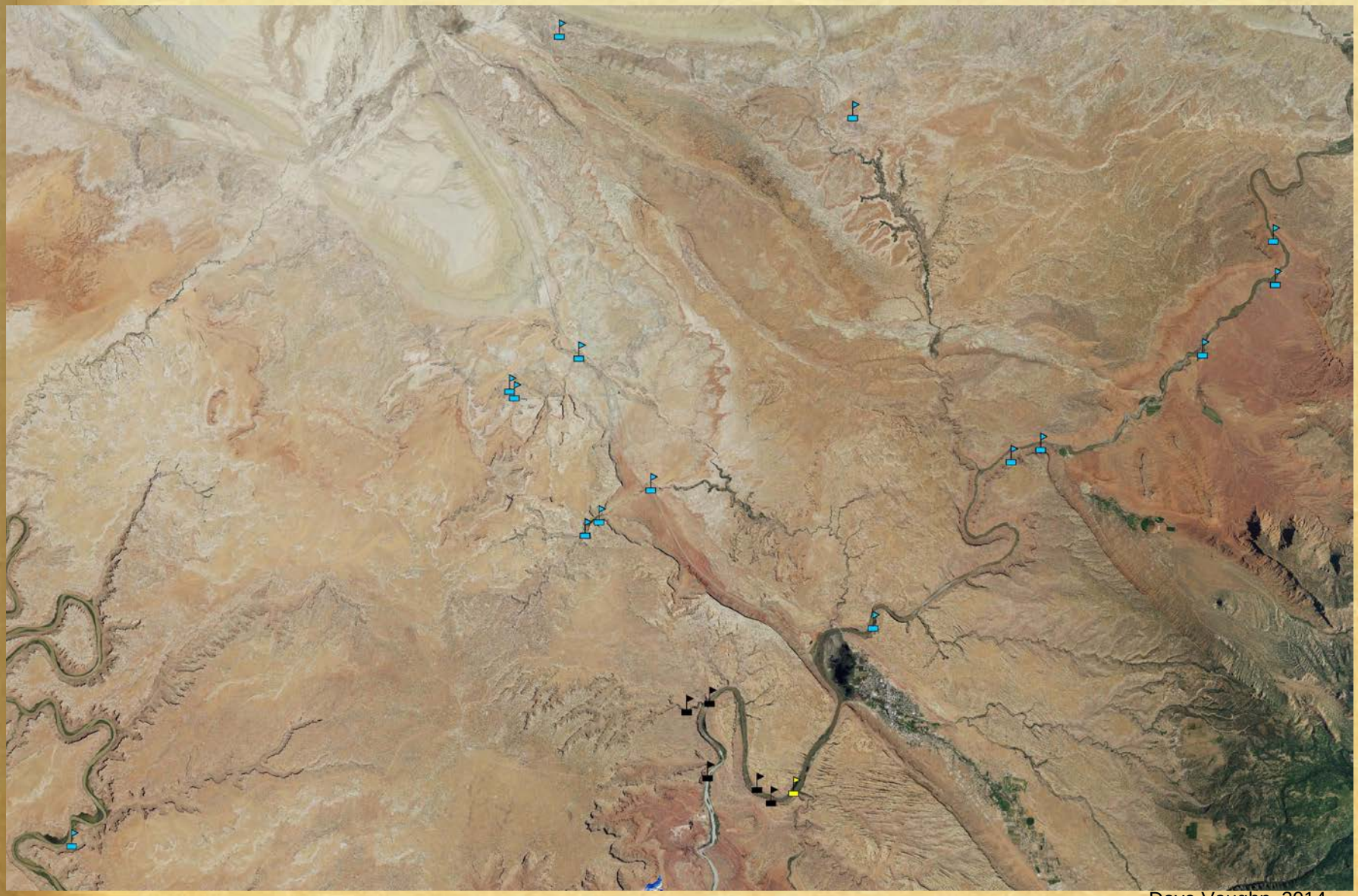
Beetle Browning 2005 at WB

Jerry Shue (2005)

2006 (400 ha)

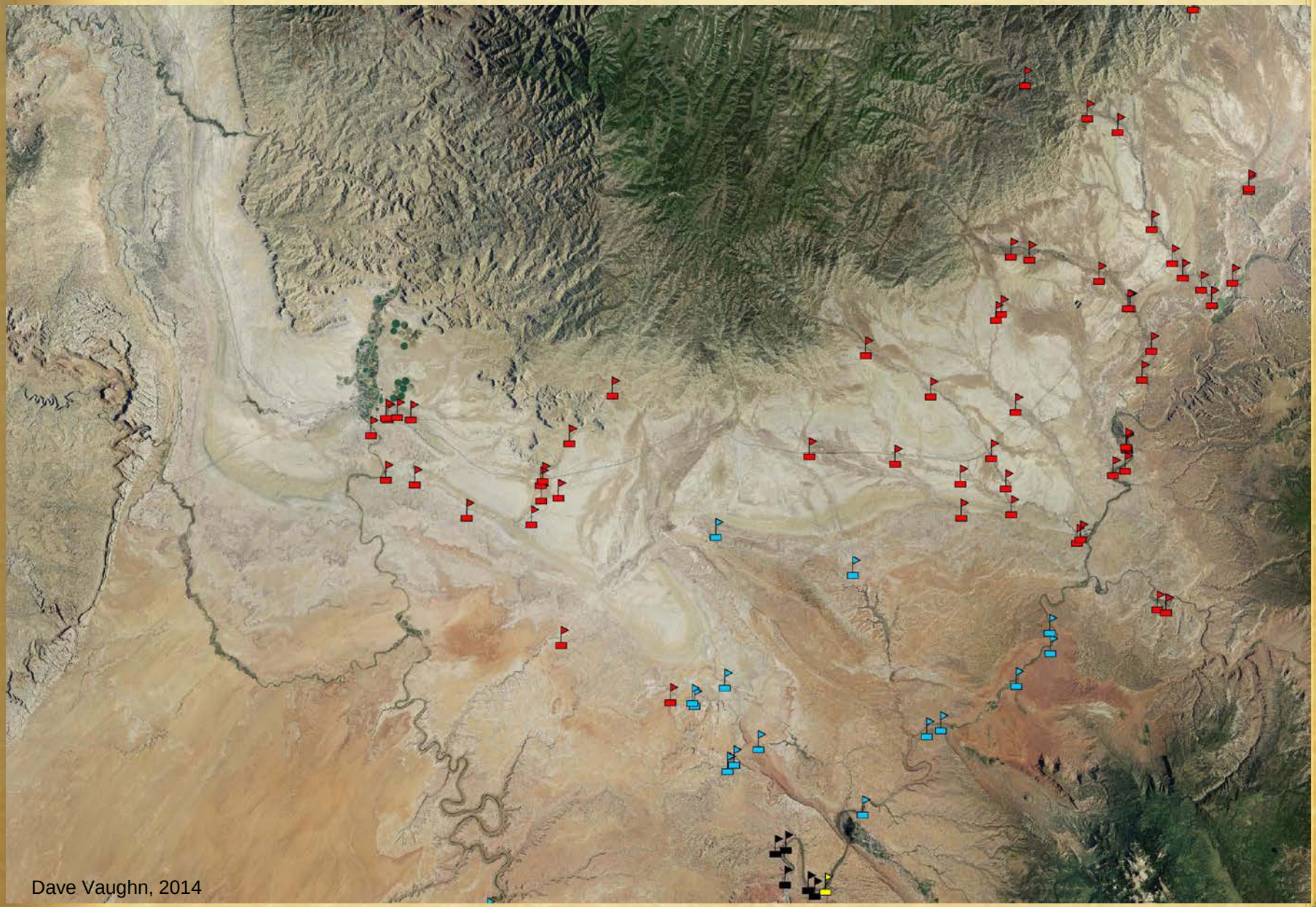
Dave Vaughn, 2014

2007 (4000 ha)



Dave Vaughn, 2014

2008 - 2013 (> 650,000 ha)



Beetle Browning 2008 at WB

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So … *Diorhabda carinulata*

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+ Green Tamarisk (2005)

Tim Higgs

= Dead Tamarisk (2008)

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Even Falling Down Dead (2010)

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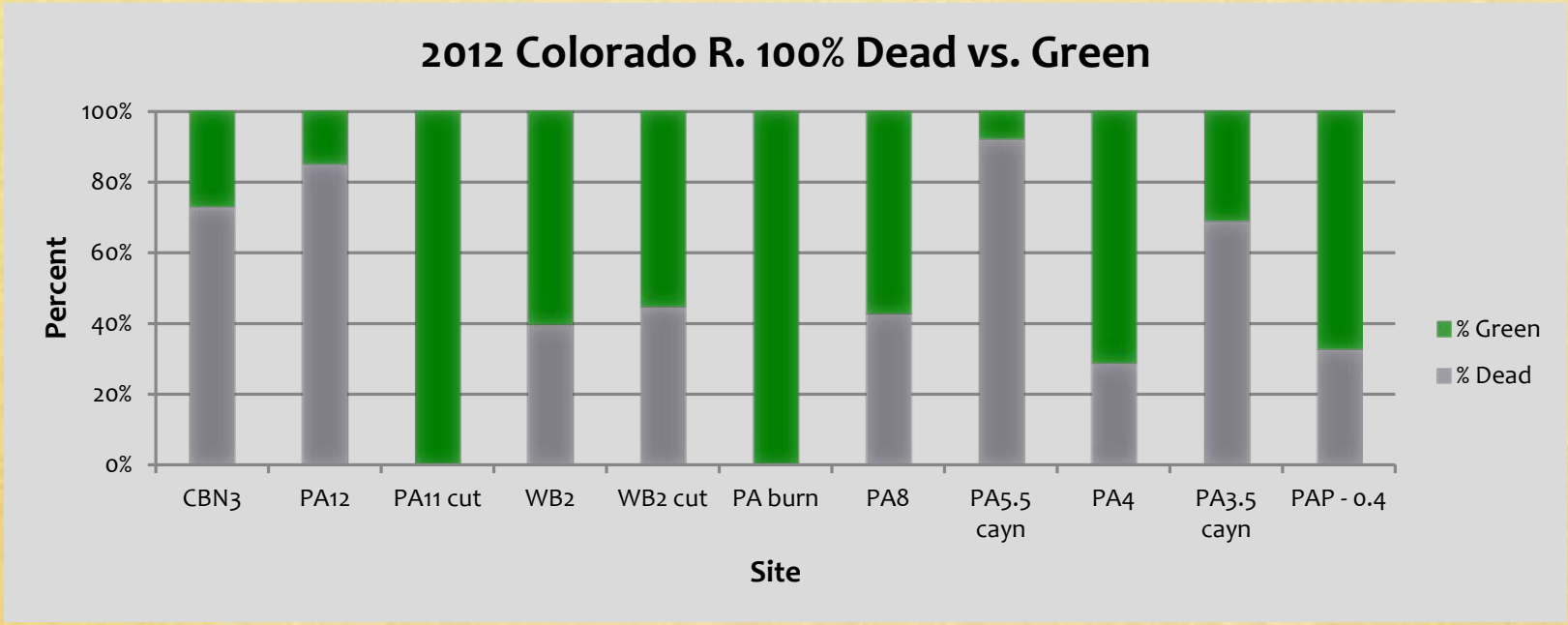
II.

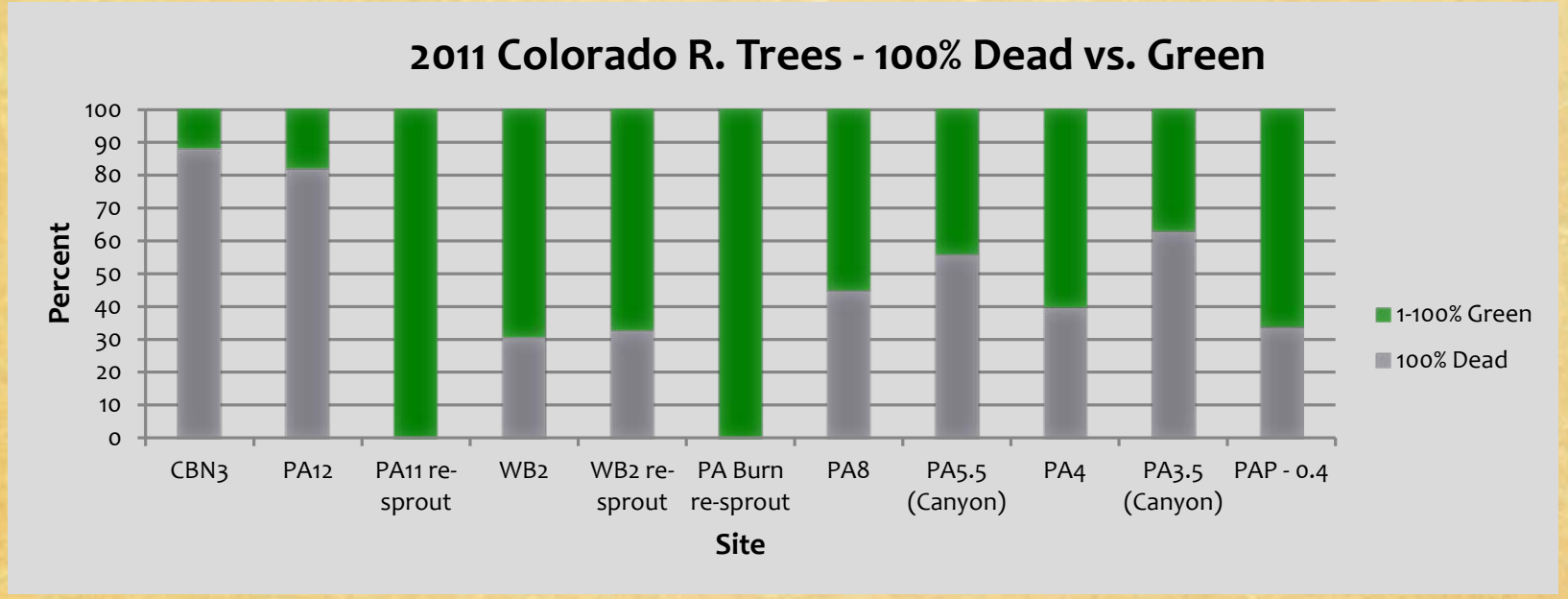
Tamarisk Mortality Surveys

2008 - 2012

Survey Methods

- Conducted in October
- Along 100 foot X 13 foot transect
- All tamarisks recorded as % green
- All tamarisks recorded as S, M, L
- Surveyed 21 sites in 2012


2012 Colorado R. 100% Dead vs. Green
Percent
100%
80%
60%
40%
20%
0%
CBN3
PA12
PA11 cut
WB2
WB2 cut
PA burn
PA8
PA5.5 cayn
PA4
PA3.5 cayn
PAP - 0.4
Site
% Green
% Dead


2011 Colorado R. Trees - 100% Dead vs. Green
Percent
100
90
80
70
60
50
40
30
20
10
0
CBN3
PA12
PA11 re-sprout
WB2
WB2 re-sprout
PA Burn re-sprout
PA8
PA5.5 (Canyon)
PA4
PA3.5 (Canyon)
PAP - 0.4
Site
1-100% Green
100% Dead

III.

Tamarisk Mortality Surveys

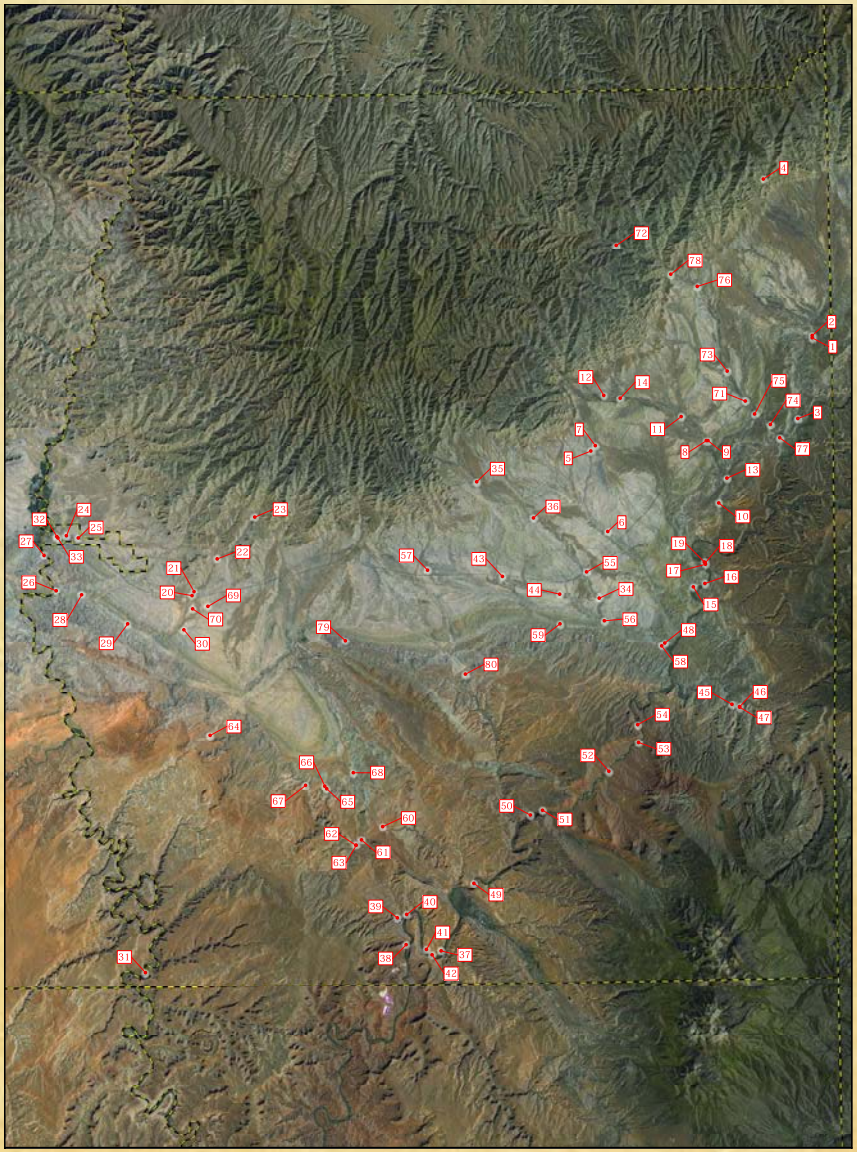
2013

2013 Mortality Survey

- Used line-intercept method
- Total survey length 160 meters:
  (baseline + random sampling transects)
- Options: 100 m base with 6 X 10 m transects

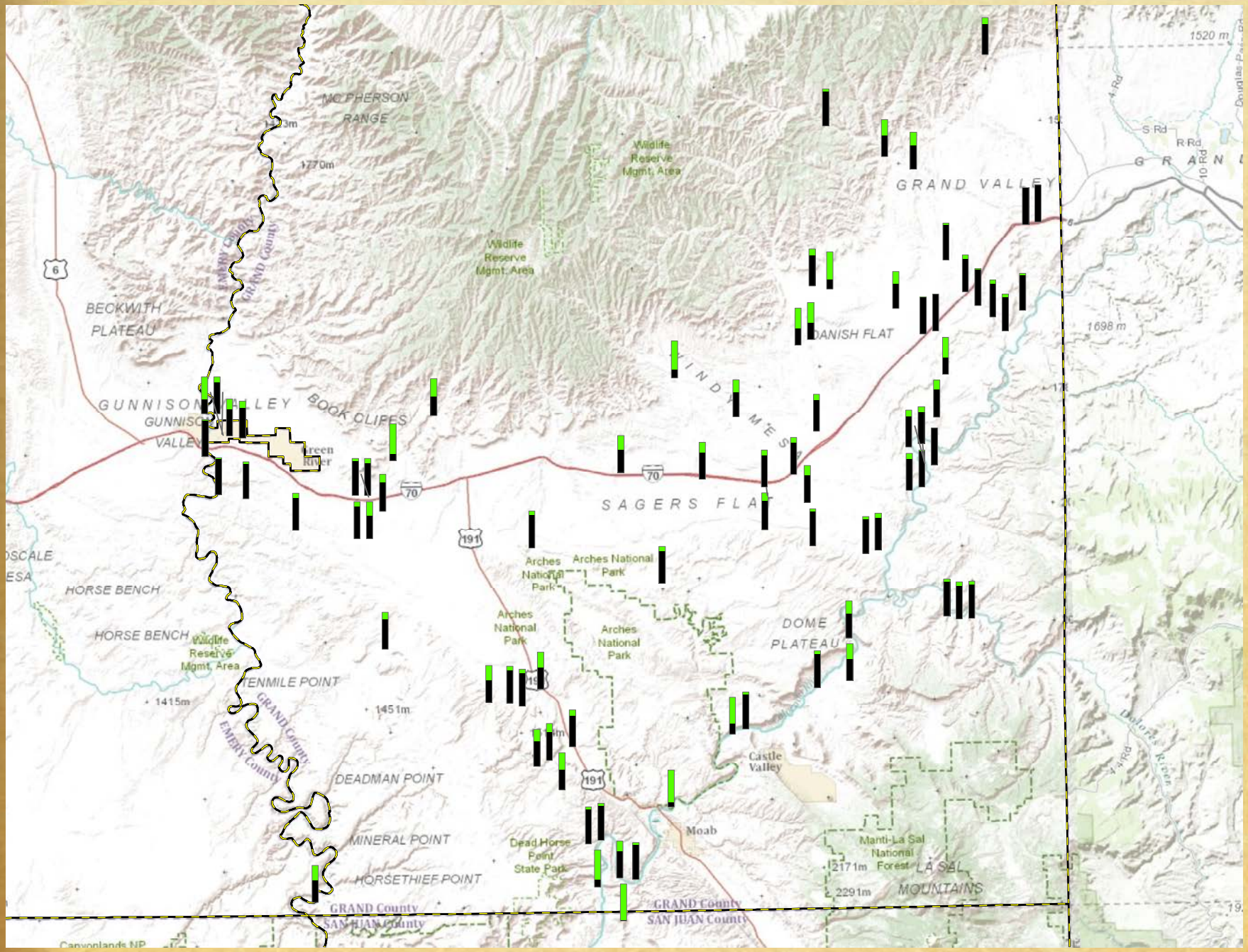
  80 m base with 4 X 20 m transects

  60 m base with 5 X 20 m transects
- Reading every 0.10 m
- Surveyed 80 suitable sites

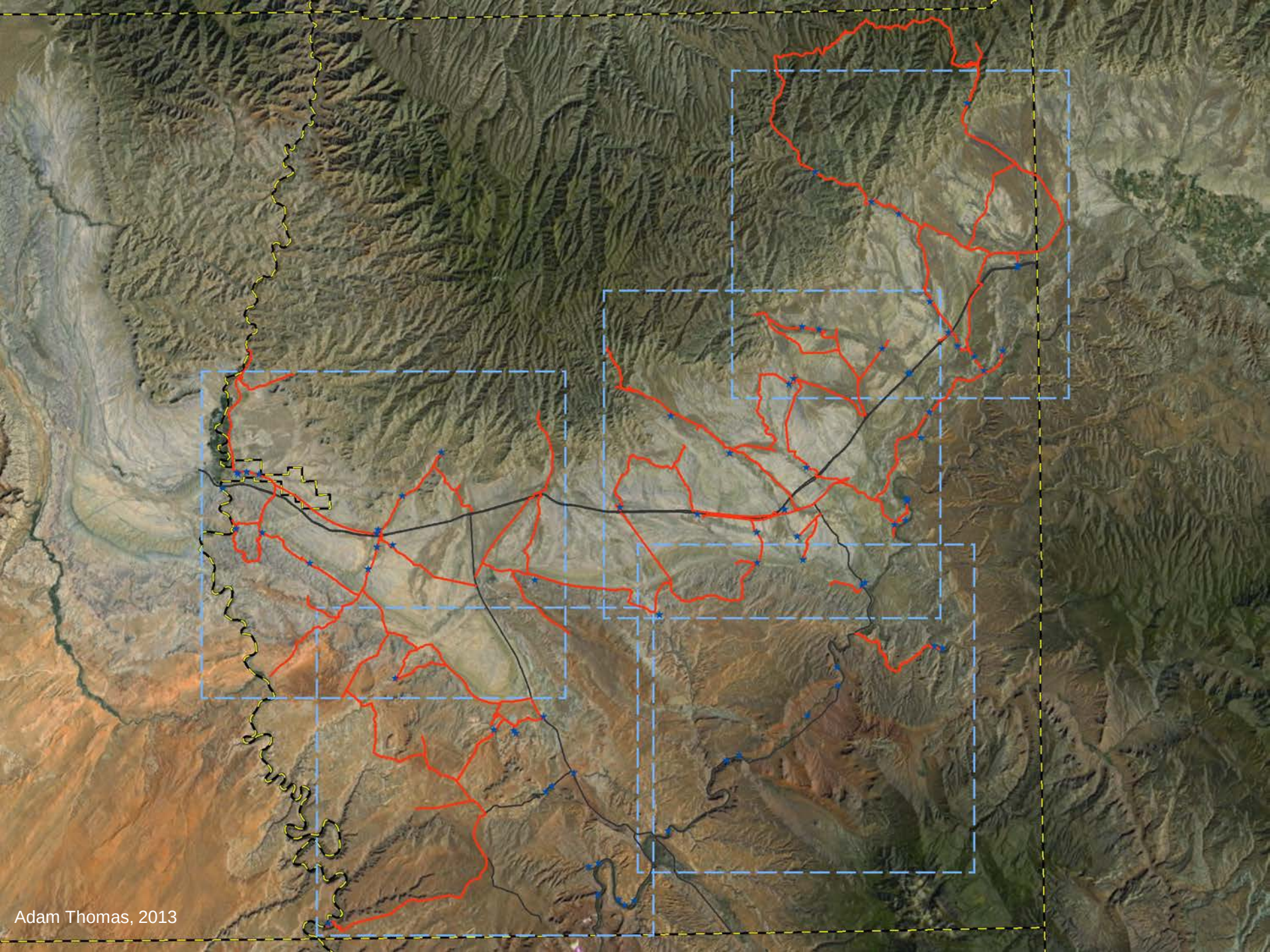

Tamarisk Site
County Boundary

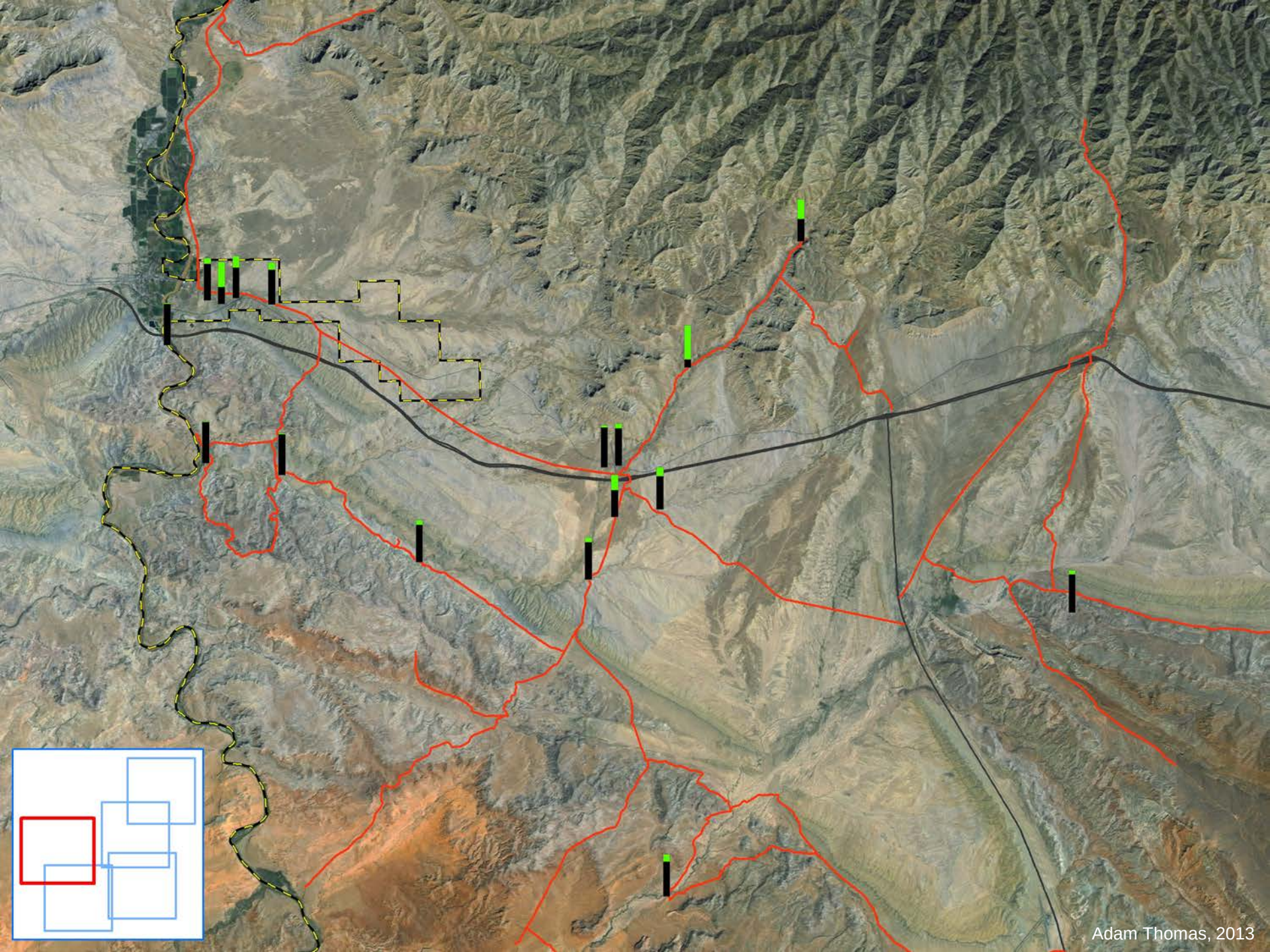
The Site Locations

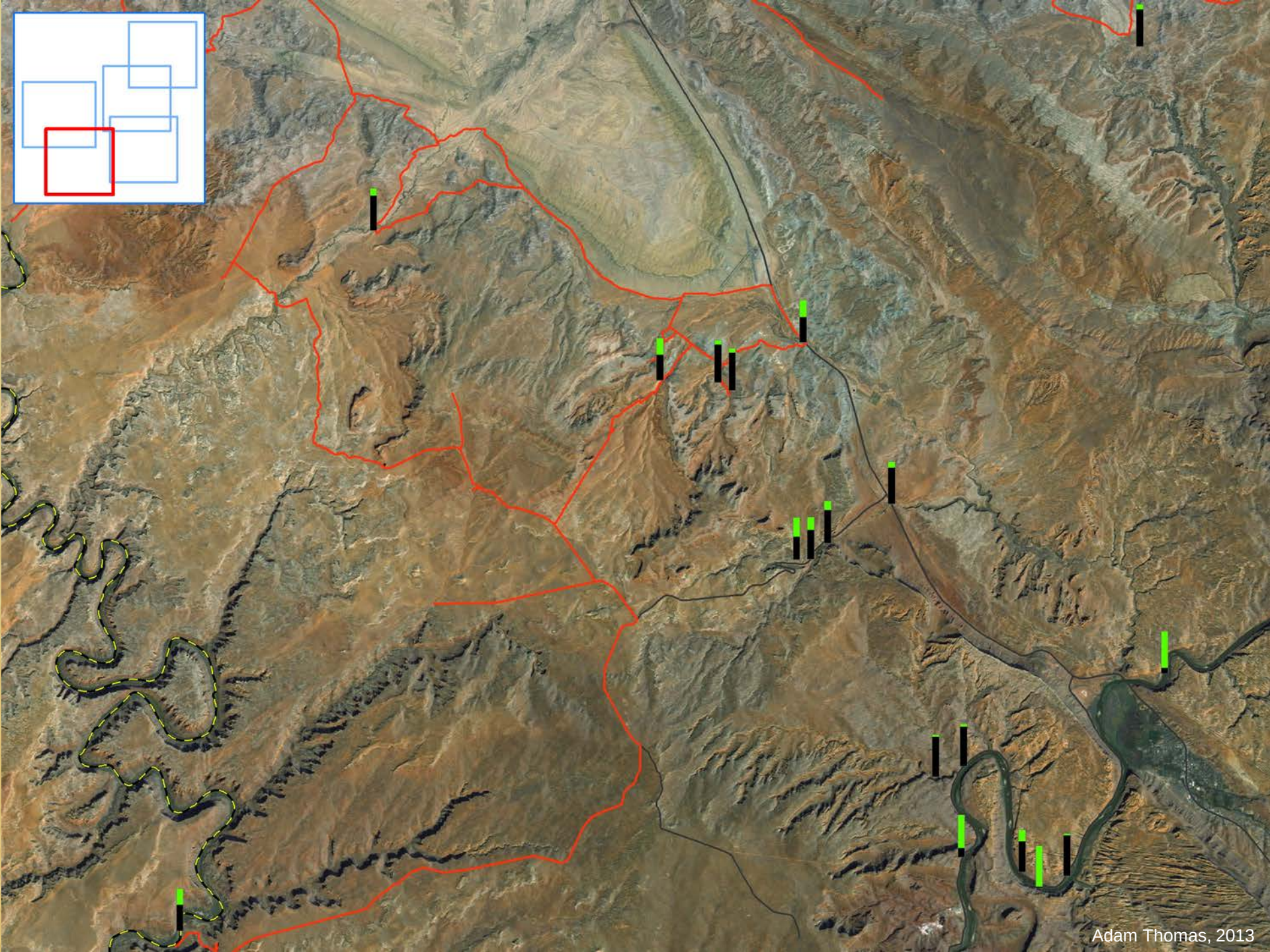
- 23 on riverbanks
- 53 along drainages
- 3 at pools where rain collects
- 1 at an oasis
- Drove > 500 off highway miles

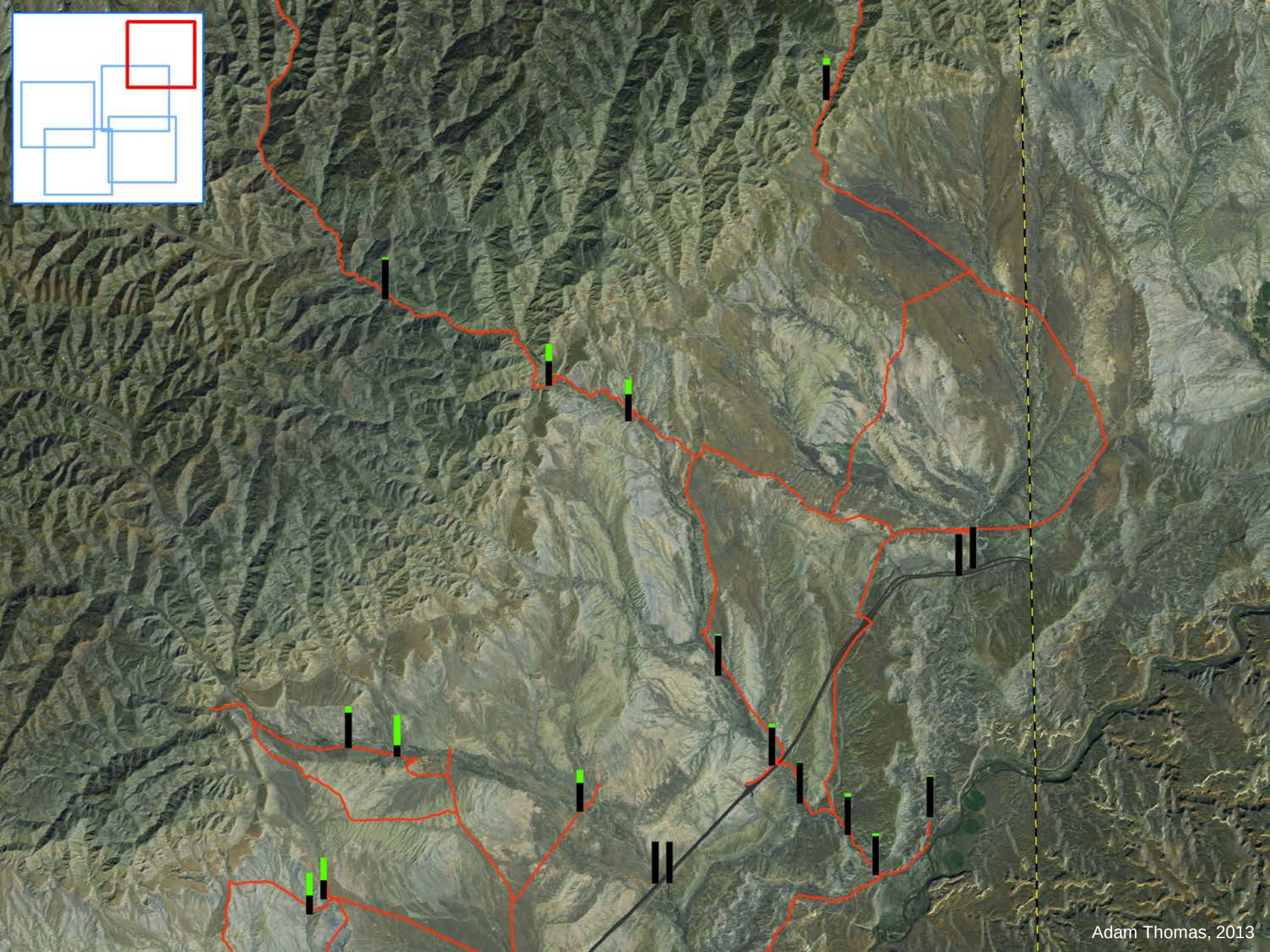


Adam Thomas, 2013

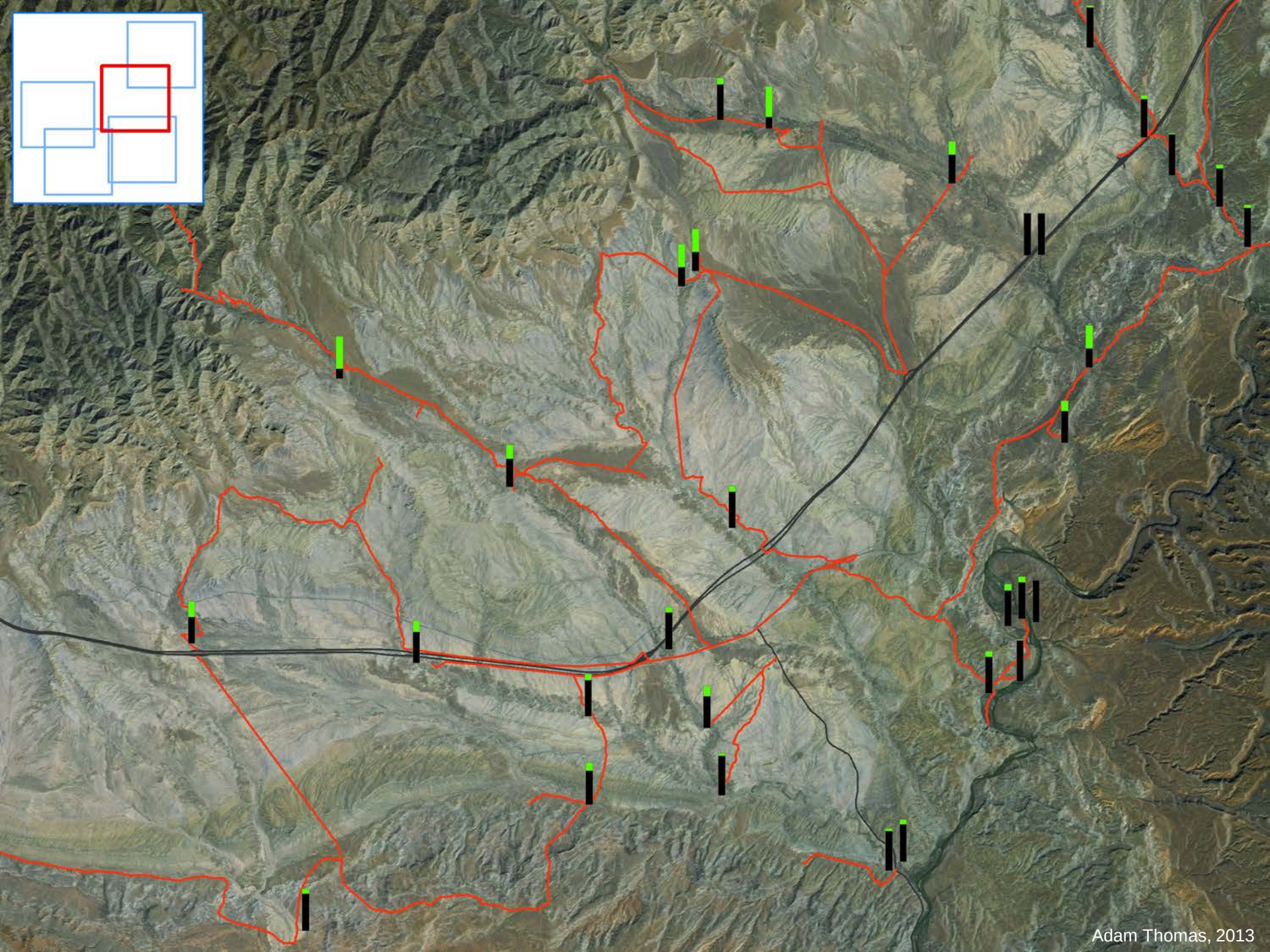

Adam Thomas, 2013

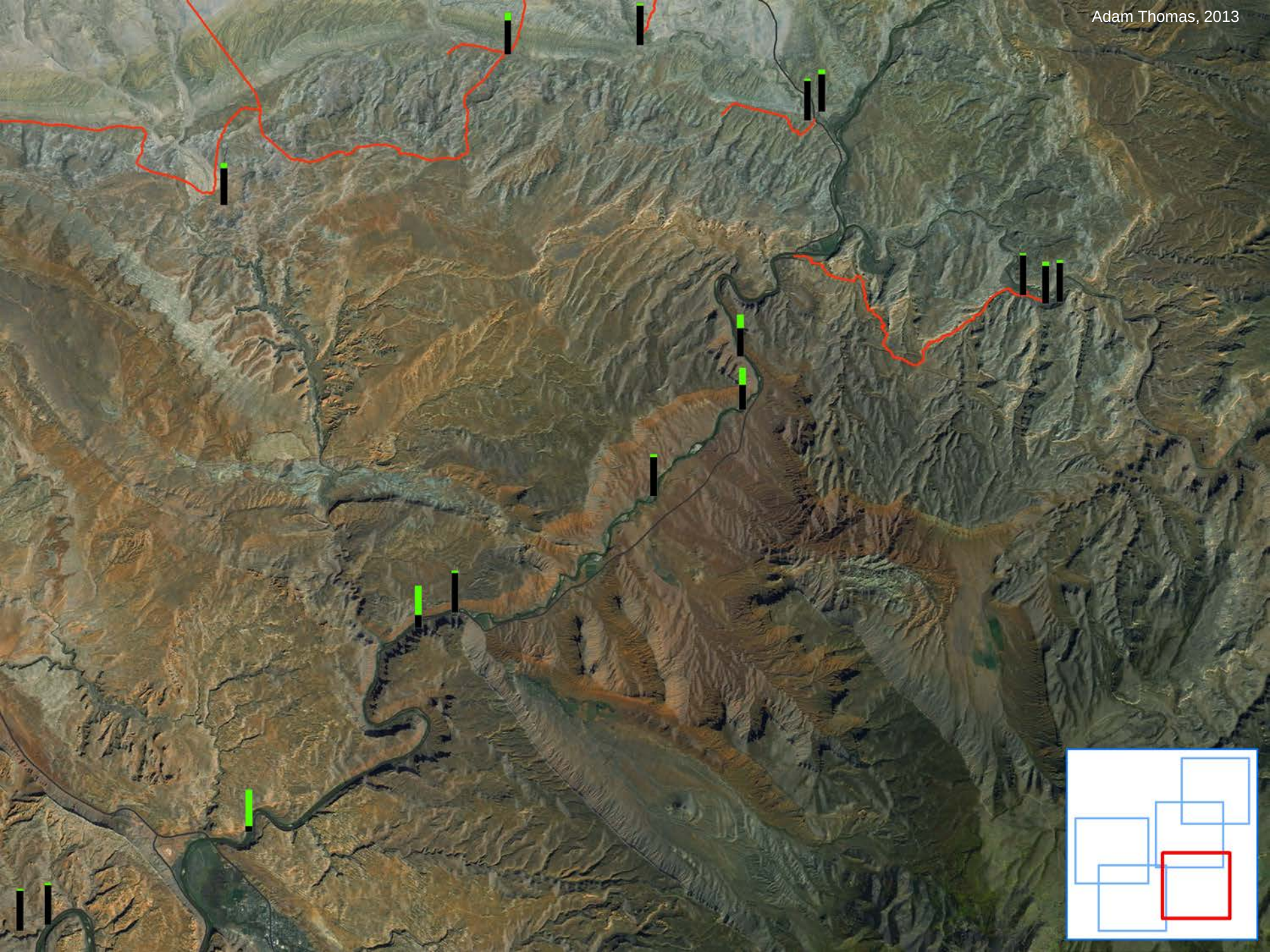

Adam Thomas, 2013


Adam Thomas, 2013



Adam Thomas, 2013


Adam Thomas, 2013


Adam Thomas, 2013

% Green by Location

Loc. \ % Green	0 – 24.9%	25 – 49.9%	50 – 74.9%	75 – 100%
River (23)	15 (65%)	4 (17%)	1 (5%)	3 (13%)
Drainage (53)	32 (60%)	15 (28%)	4 (8%)	2 (4%)
Pool (3)	3 (100%)	0	0	0
Wet (1)	0	0	1 (100%)	0
Total (% of all 80 sites)	50 (62%)	19 (24%)	6 (8%)	5 (6%)

The “Most Green” Sites

- 7 of 80 sites were ≥ 70% green
- 3 sites near base of Book Cliffs
- 1 site cut in early 2000s
- 3 sites recent cut and burn locations
- Average green: 4 cut/burn areas = 83%

IV.

A Sidebar

(The splendid weevil in G.C.)

Some Weevil Stats

- *Coniatus splendidulus*
- Found 2 adults in litter - January, 2012
- We saw first pupa cases - June of 2012
- By September cases at 60% of 71 sites
- In 2013 cases at **86%** of our 71 sites
- Cases at very remote desert locations

How much is this guy browning?

From: http://bugguide.net/node/view/415564

And that is …

Wright Robinson