

2016 Annual Report and Proposed Budget for Fiscal Year 2017-18

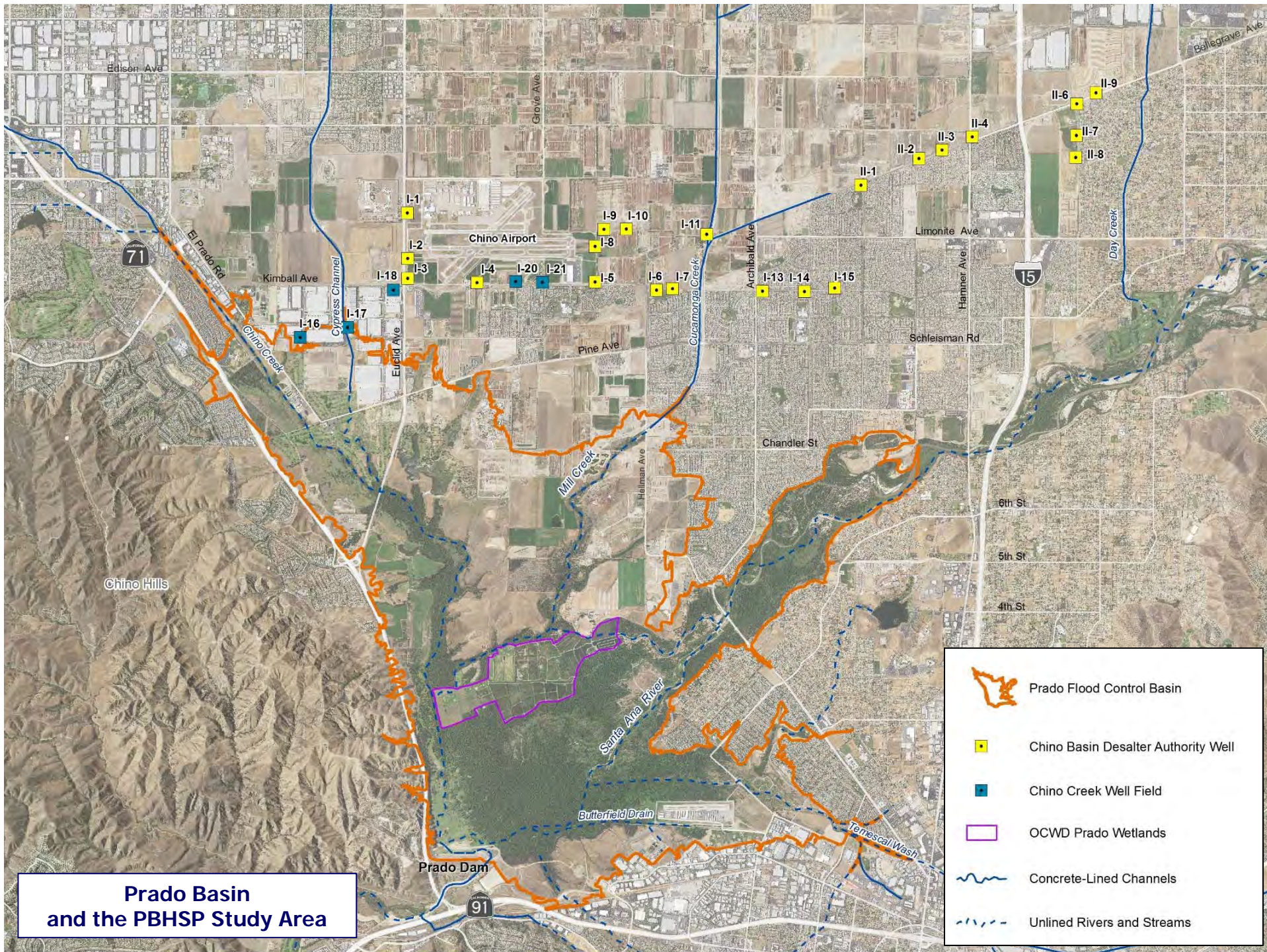
Prado Basin Habitat Sustainability Committee Meeting
March 21, 2017

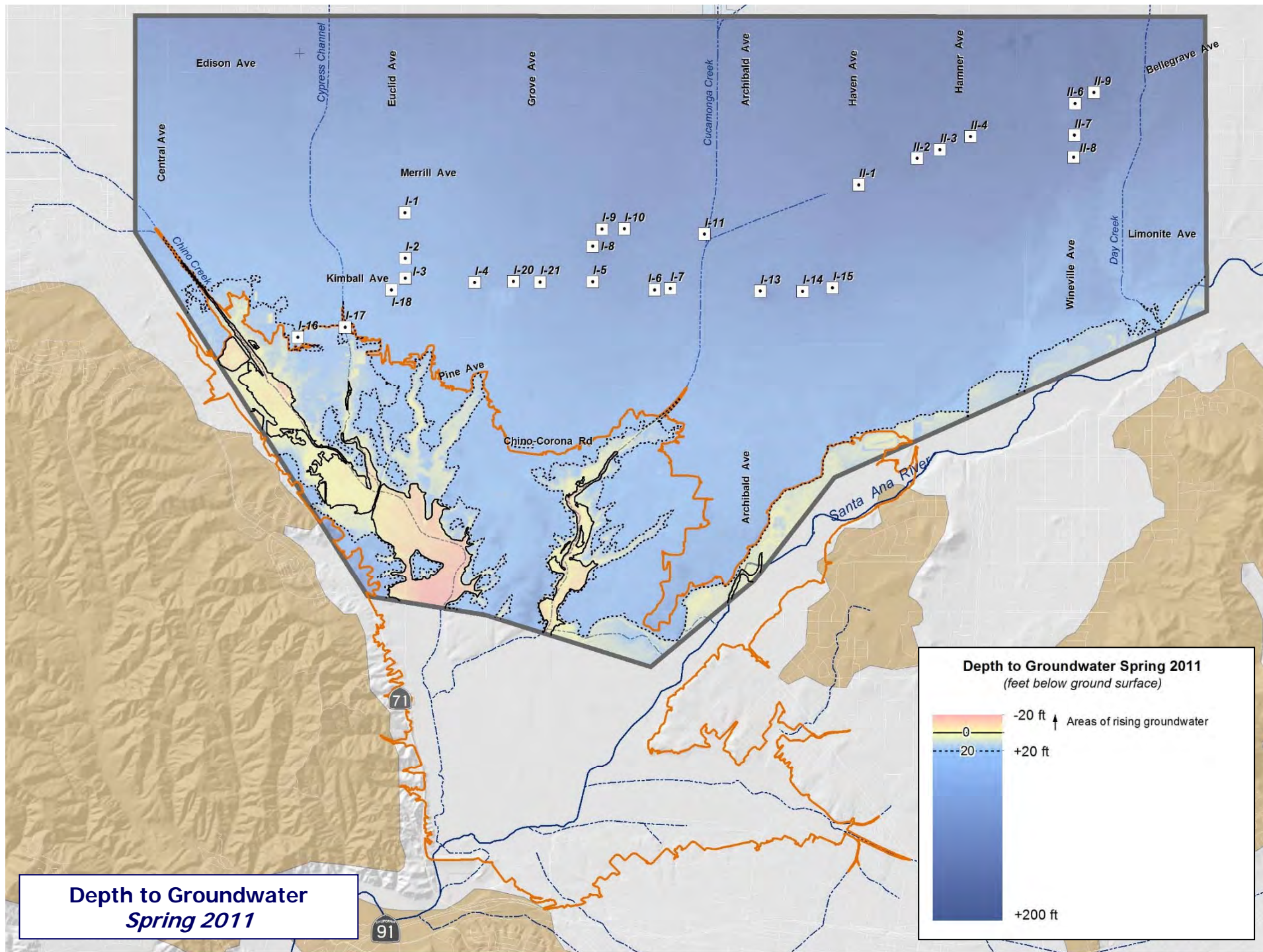


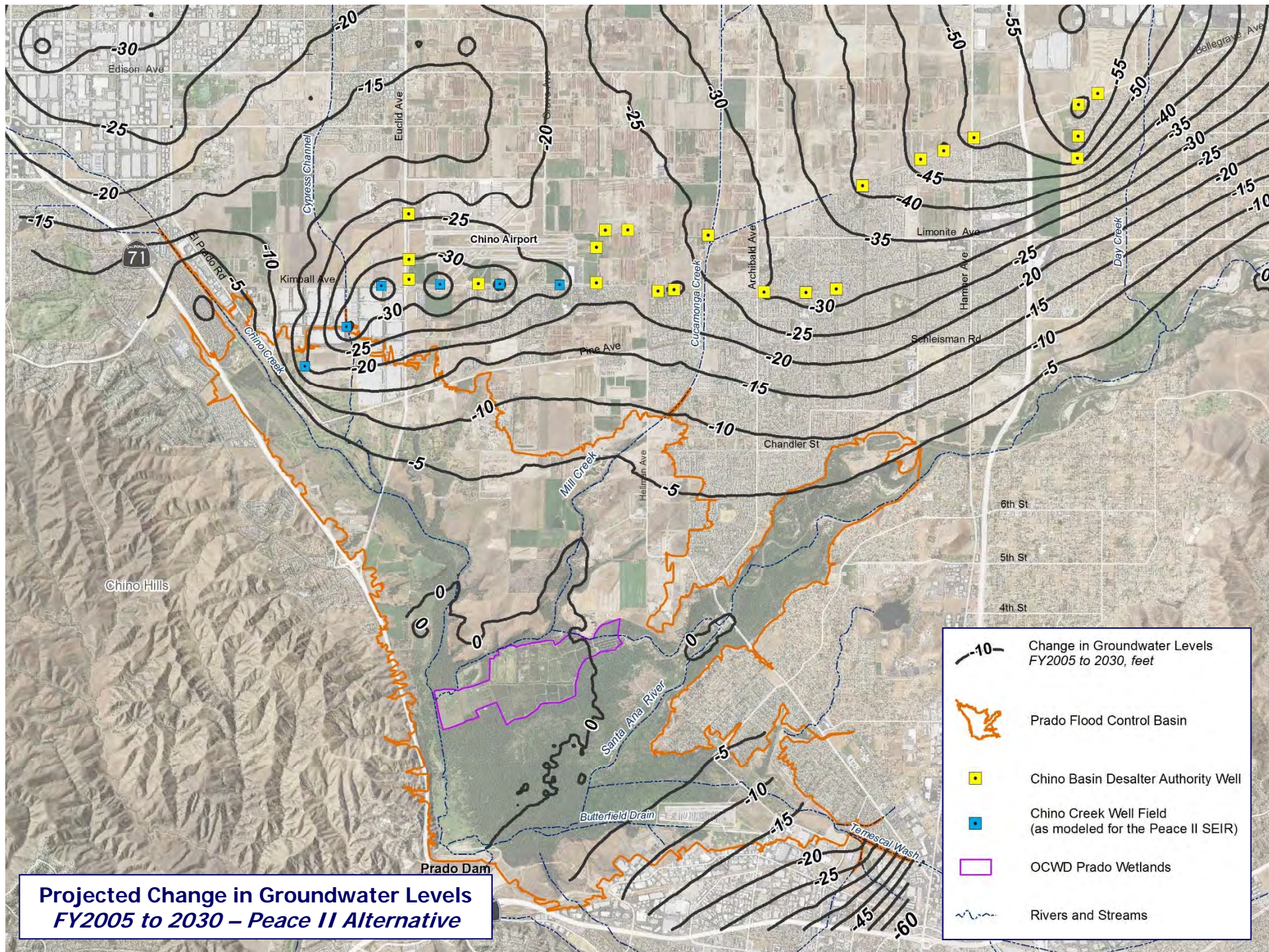
Agenda

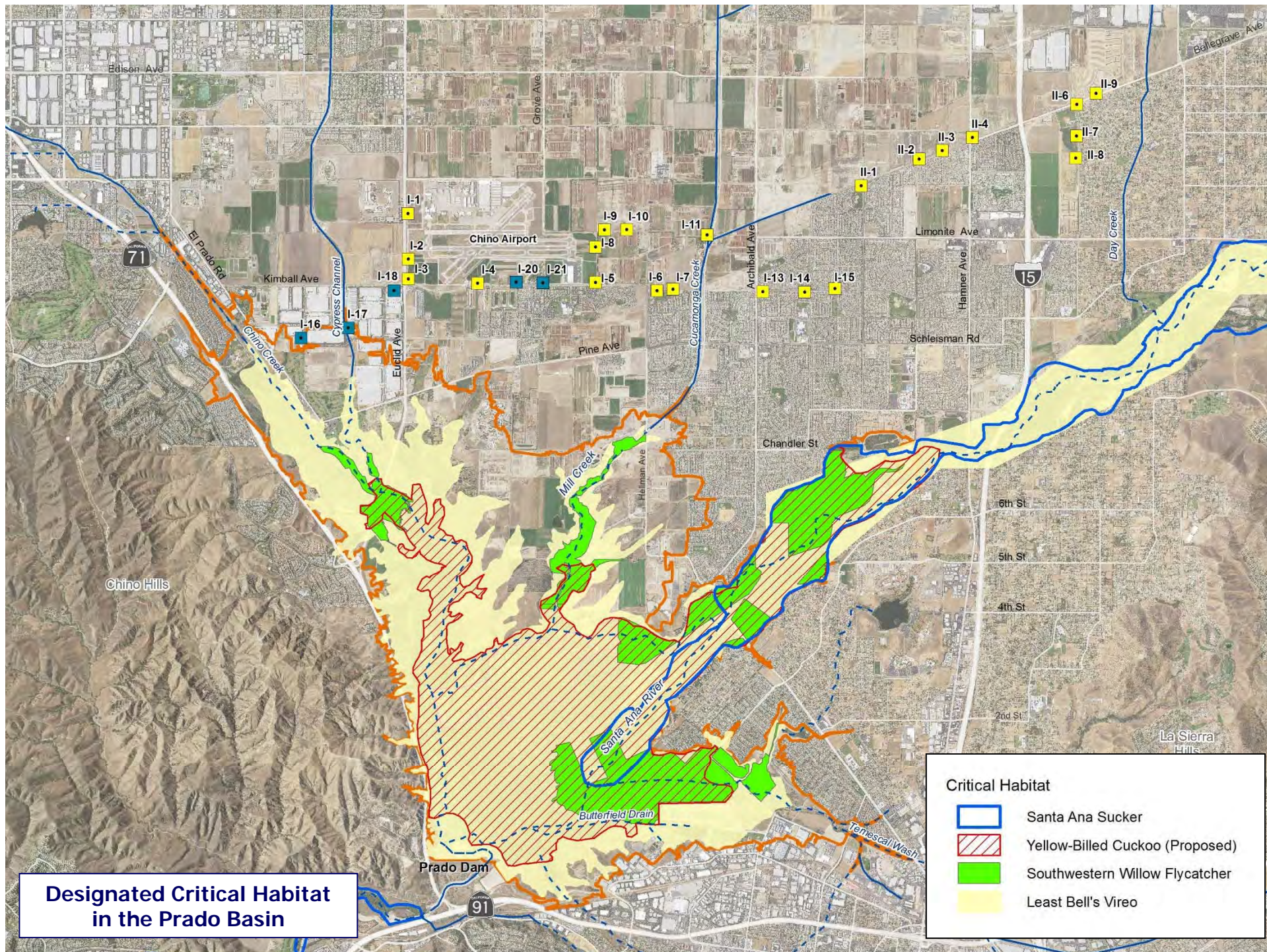
1. Background
2. Review of the draft 2016 Annual Report for the PBHSC
3. Scope, Schedule, and Budget for the PBHSP for Fiscal Year 2017/18
4. Next steps







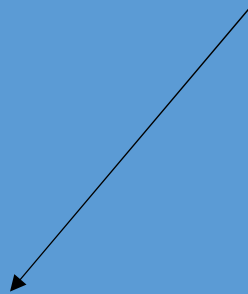




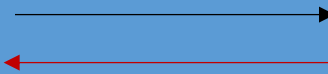
Peace II SEIR
Monitoring and Mitigation Measure 4.4-3



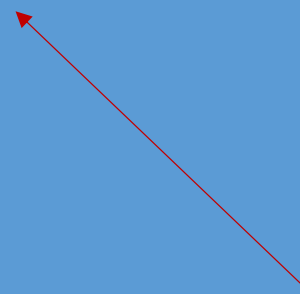
Adaptive Management Plan



Monitoring Program



Annual Reporting



Annual Report – Table of Contents

- Section 1 – Introduction
 - Section 2 – Methods
 - Section 3 – Results and Interpretations
 - 3.1 – Trends in Riparian Habitat Extent and Quality
 - 3.2 – Groundwater and Its Relationship to the Riparian Habitat
 - 3.3 – Climate and Its Relationship to the Riparian Habitat
 - 3.4 – Surface Water and Its Relationship to the Riparian Habitat
 - 3.5 – Other Factors and Their Relationship to the Riparian Habitat
 - 3.6 – Analysis of Prospective Loss of Riparian Habitat
 - Section 4 – Conclusions and Recommendations
 - Section 5 – References
 - Appendix A – Monitoring Program for 2017-18
- Potential Stressors**



Riparian Habitat Monitoring Program

- Objective: Monitor the **extent and quality** of the riparian habitat
 - Pre- and post-Peace II implementation
 - Ongoing
- Two Types of Assessment:
 - Regional Assessment
 - Interpretations of air photos
 - Remote sensing data (NDVI derived from Landsat imagery)
 - Site Specific Assessment → “Ground-truth” of regional assessment
 - Vegetation Surveys (USBR and OCWD)
 - Photo Stations (OCWD)



Normalized Difference Vegetation Index (NDVI)

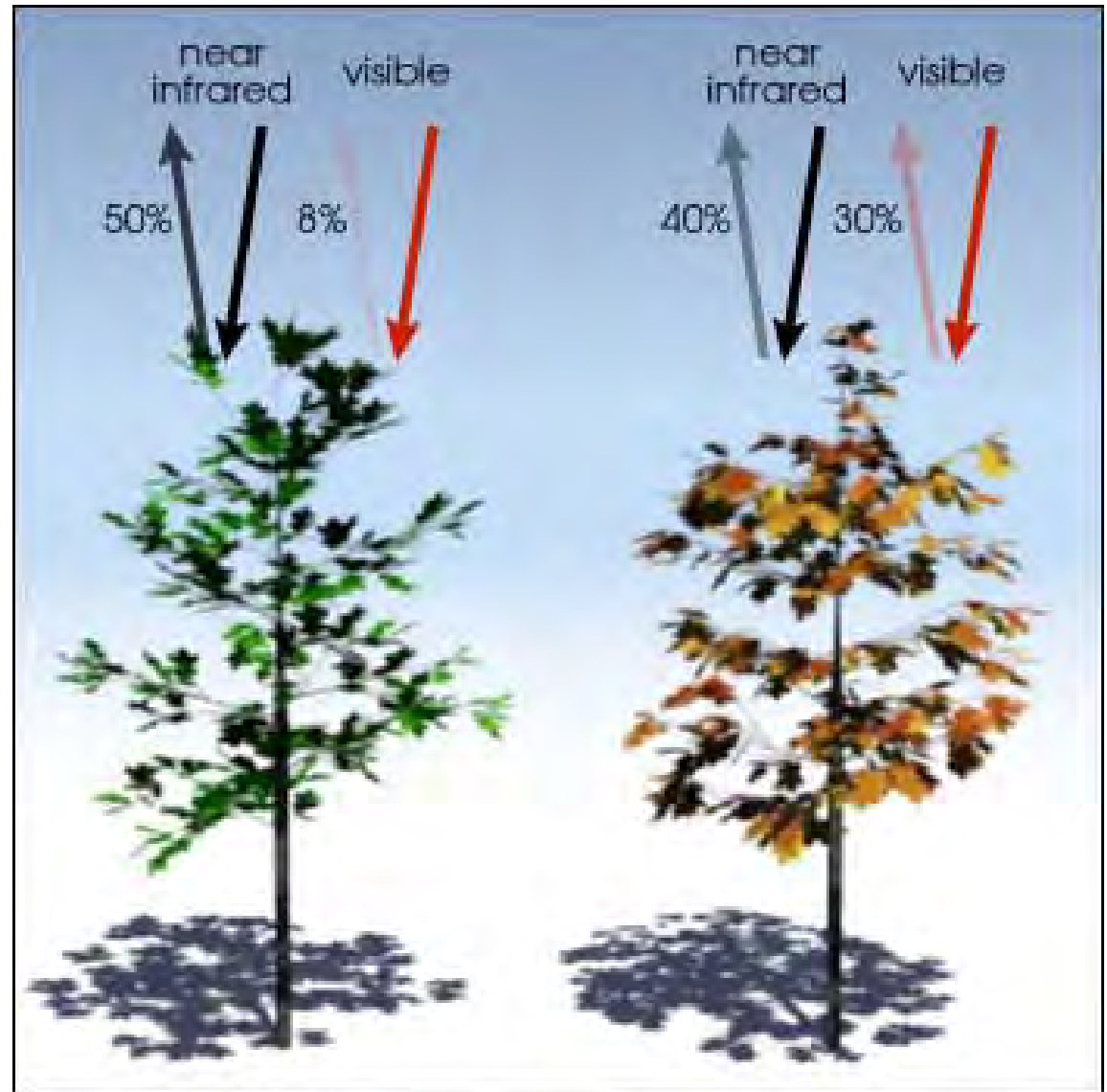
$$NDVI = \frac{NIR - VIS}{NIR + VIS}$$

Ratio calculated from absorbed and reflected light

Numerical indicator of the extent and quality of vegetation because it is correlated with photosynthesis

Can be used to access the temporal and spatial changes in vegetation (since 1980s)

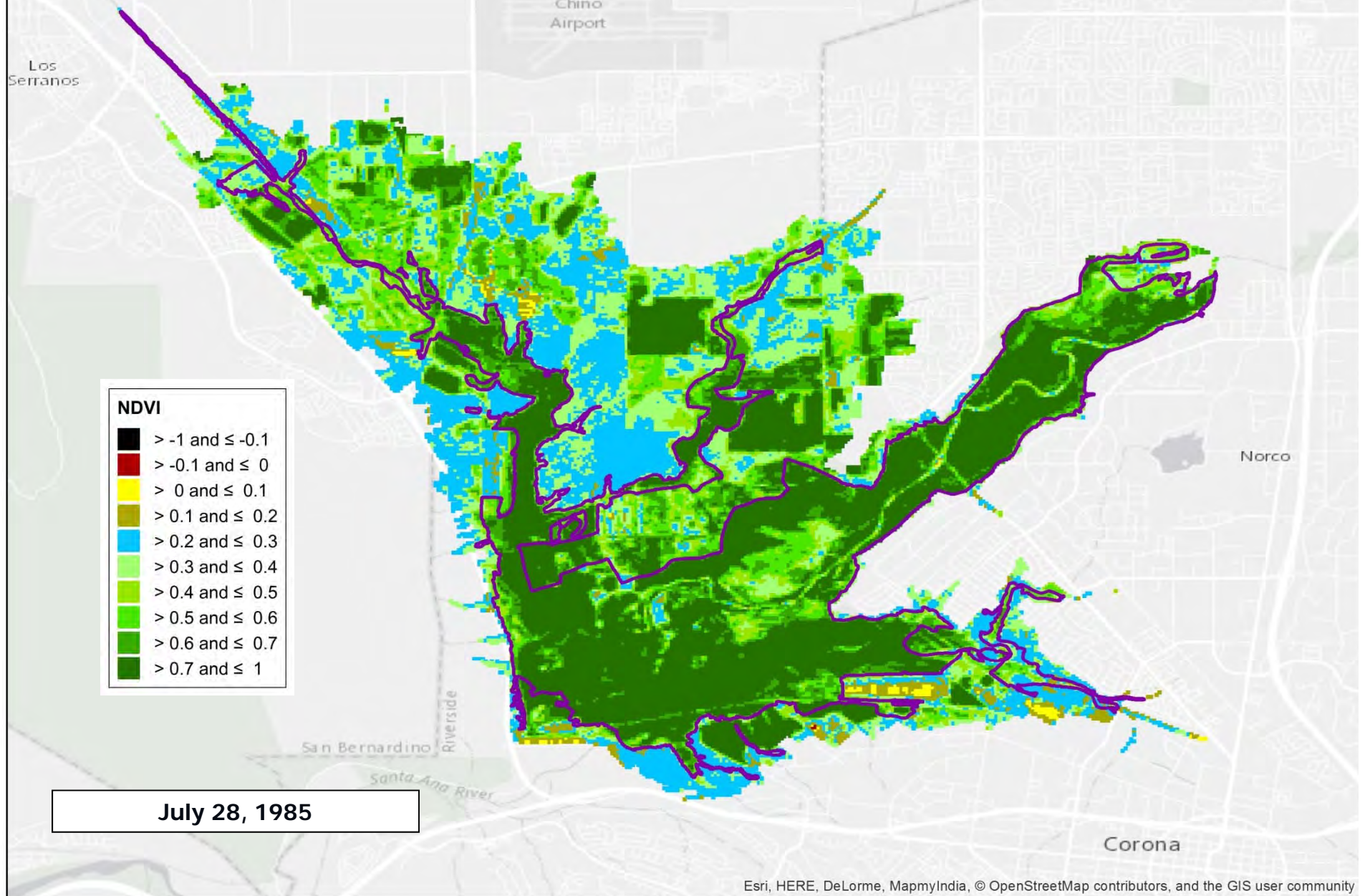
Image source:
http://earthobservatory.nasa.gov/Features/MeasuringVegetation/measuring_vegetation_2.php

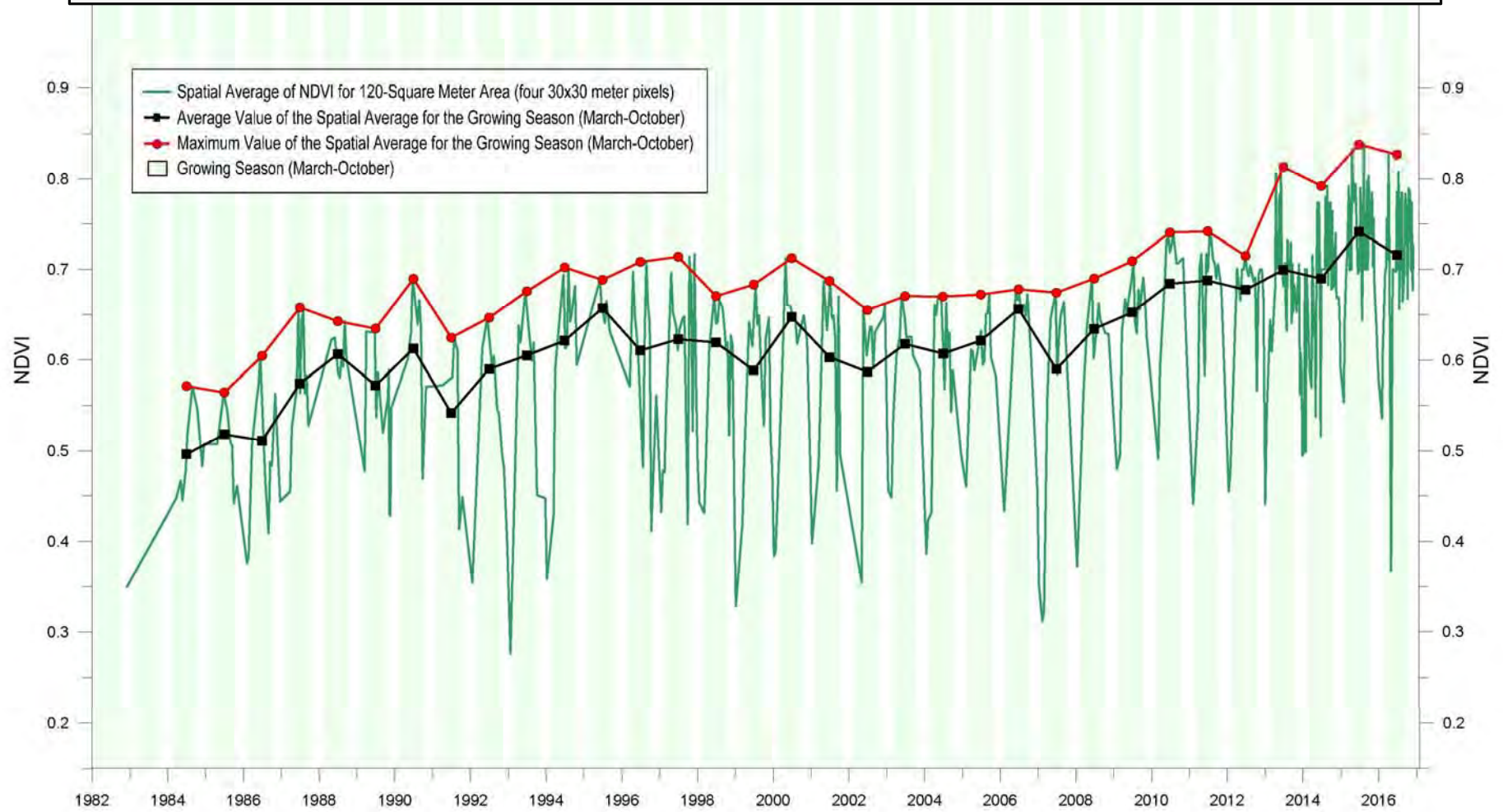
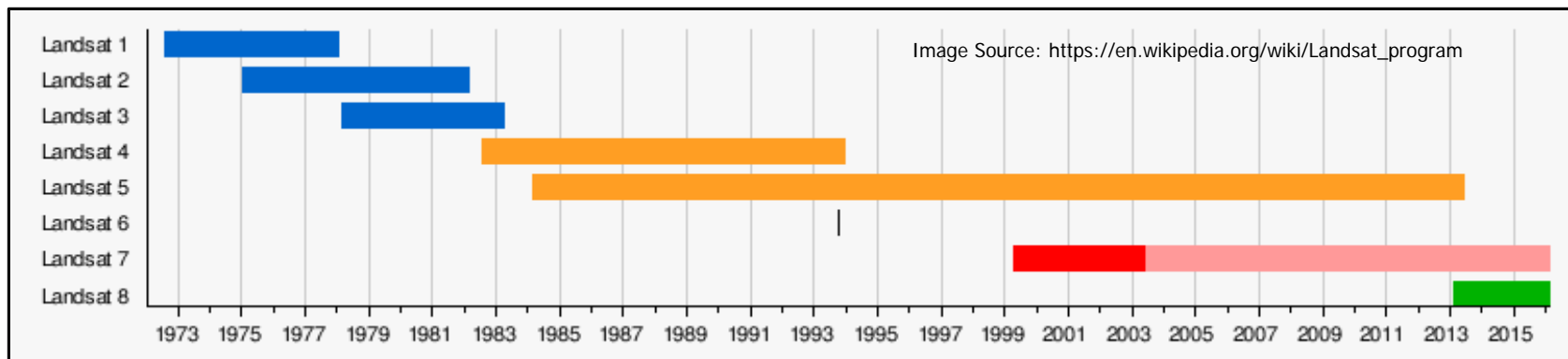


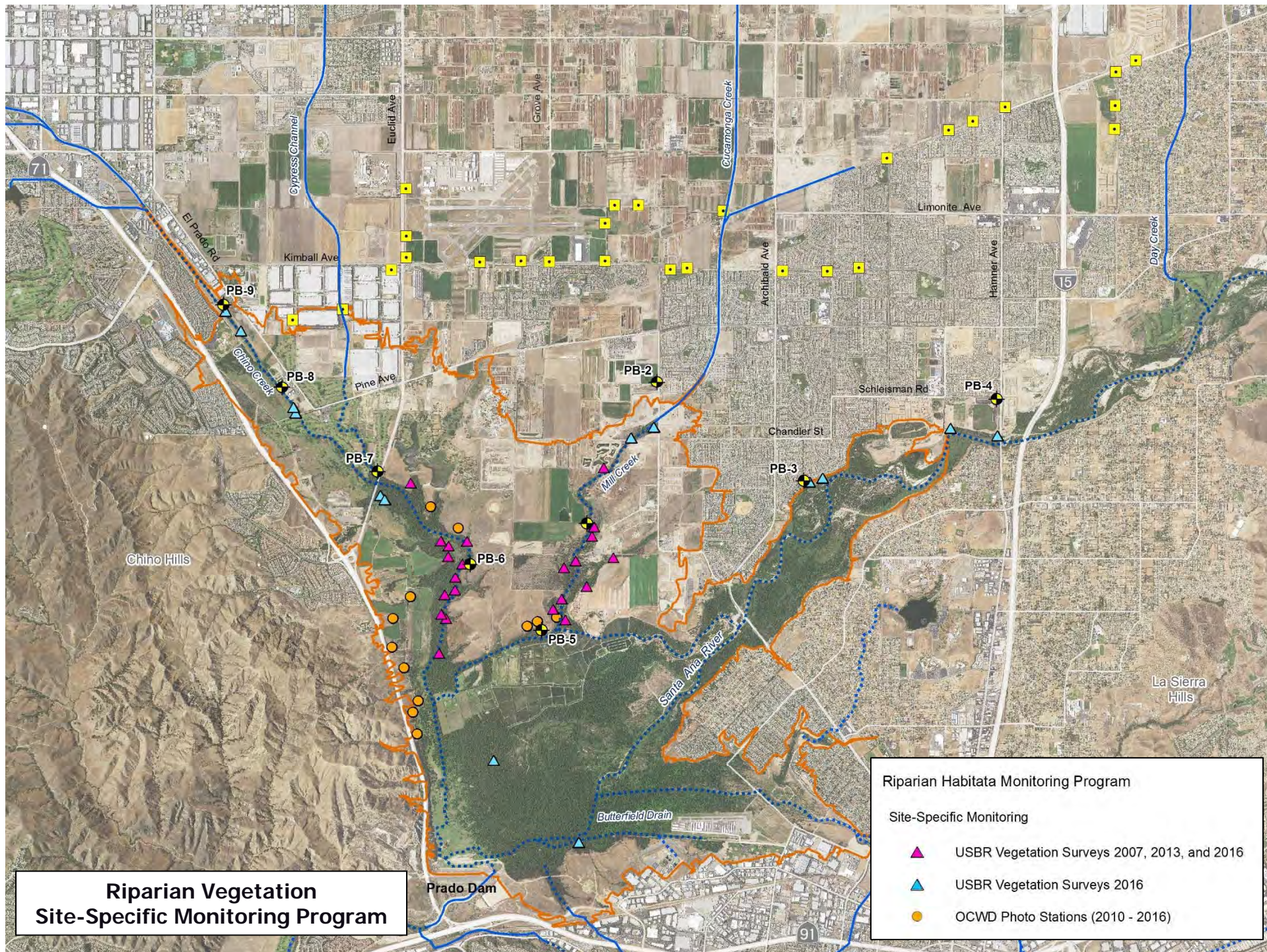
$$\frac{(0.50 - 0.08)}{(0.50 + 0.08)} = 0.72$$

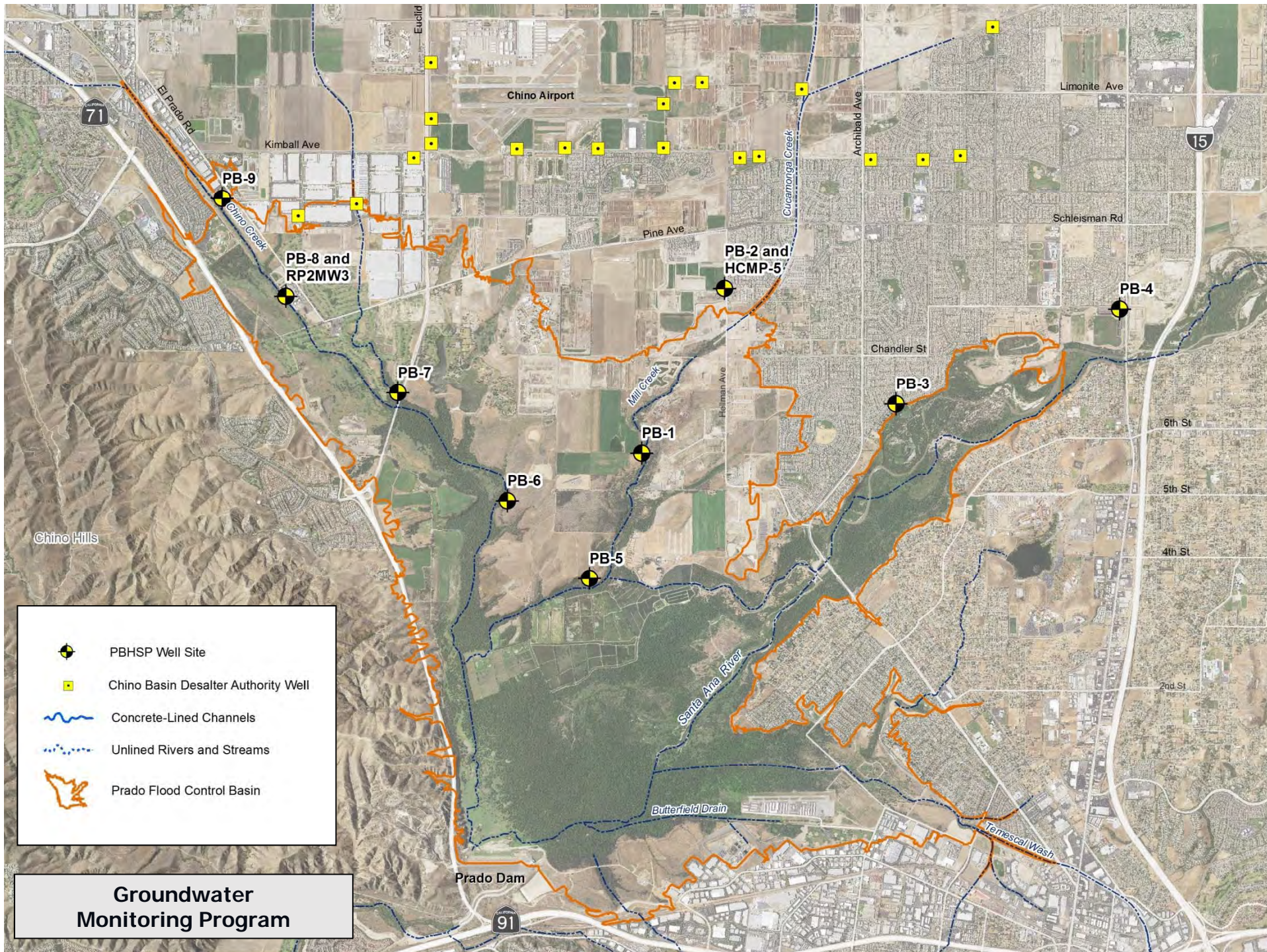
$$\frac{(0.4 - 0.30)}{(0.4 + 0.30)} = 0.14$$

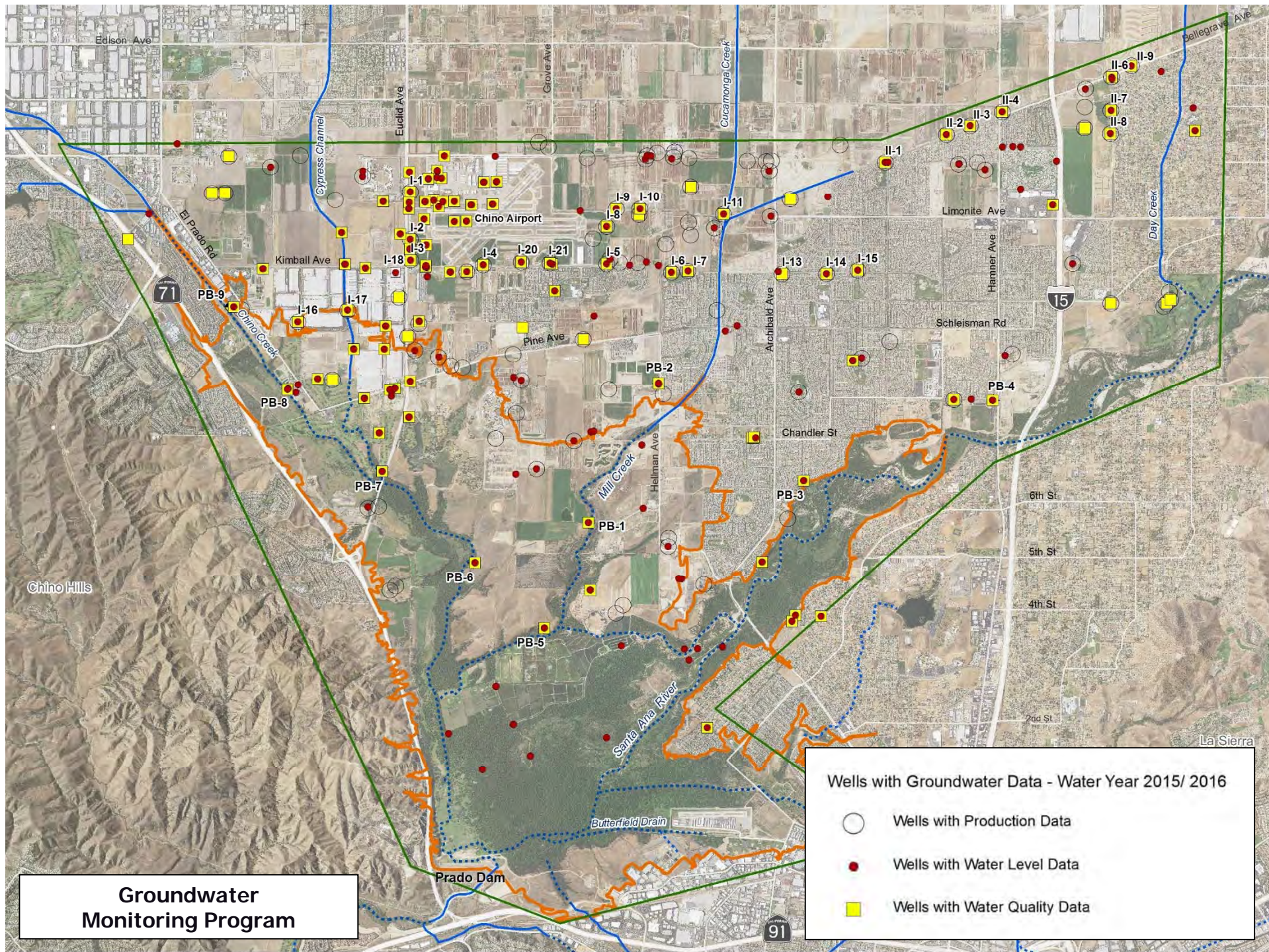
NVDI in the Prado Basin Area

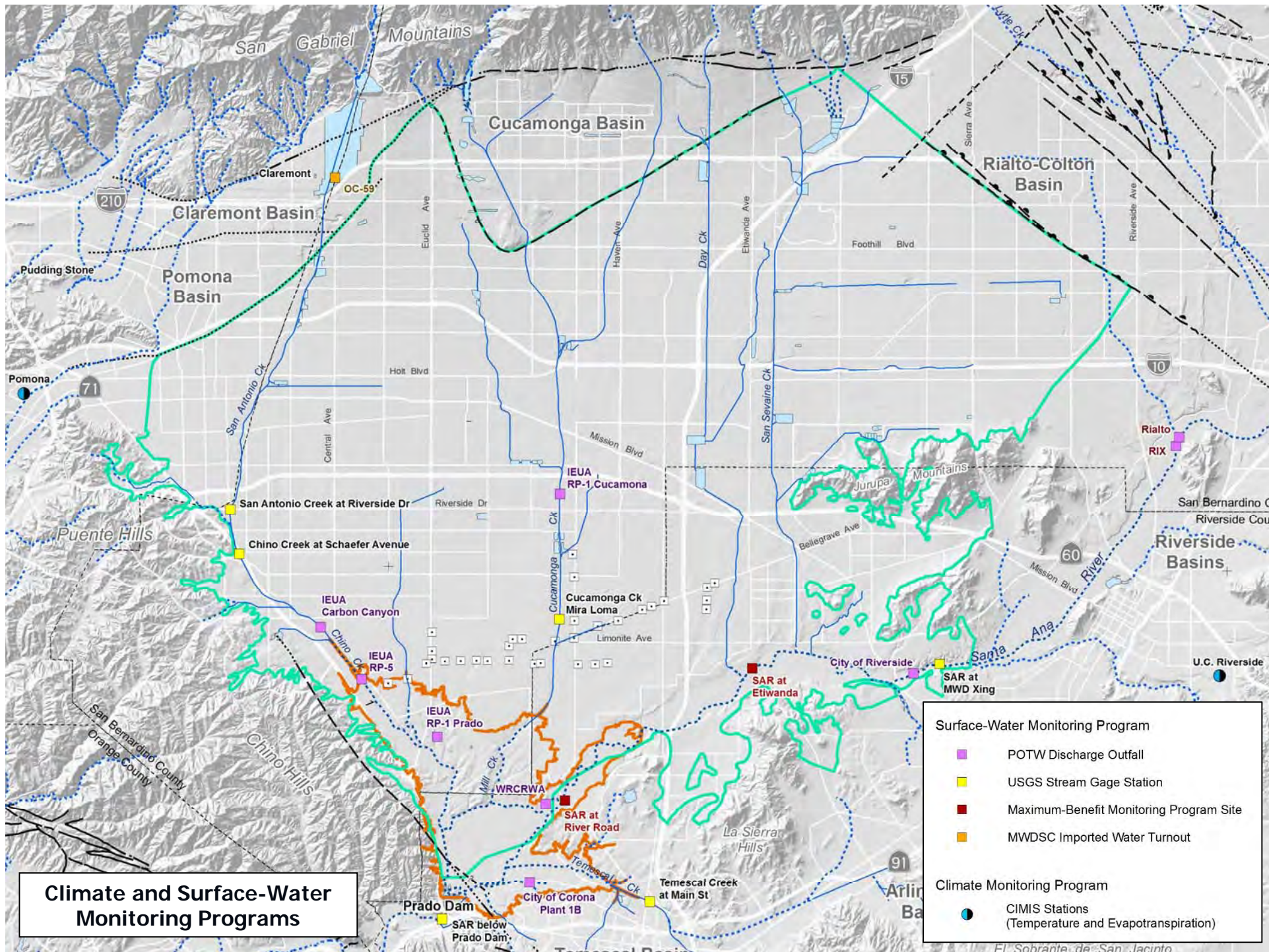








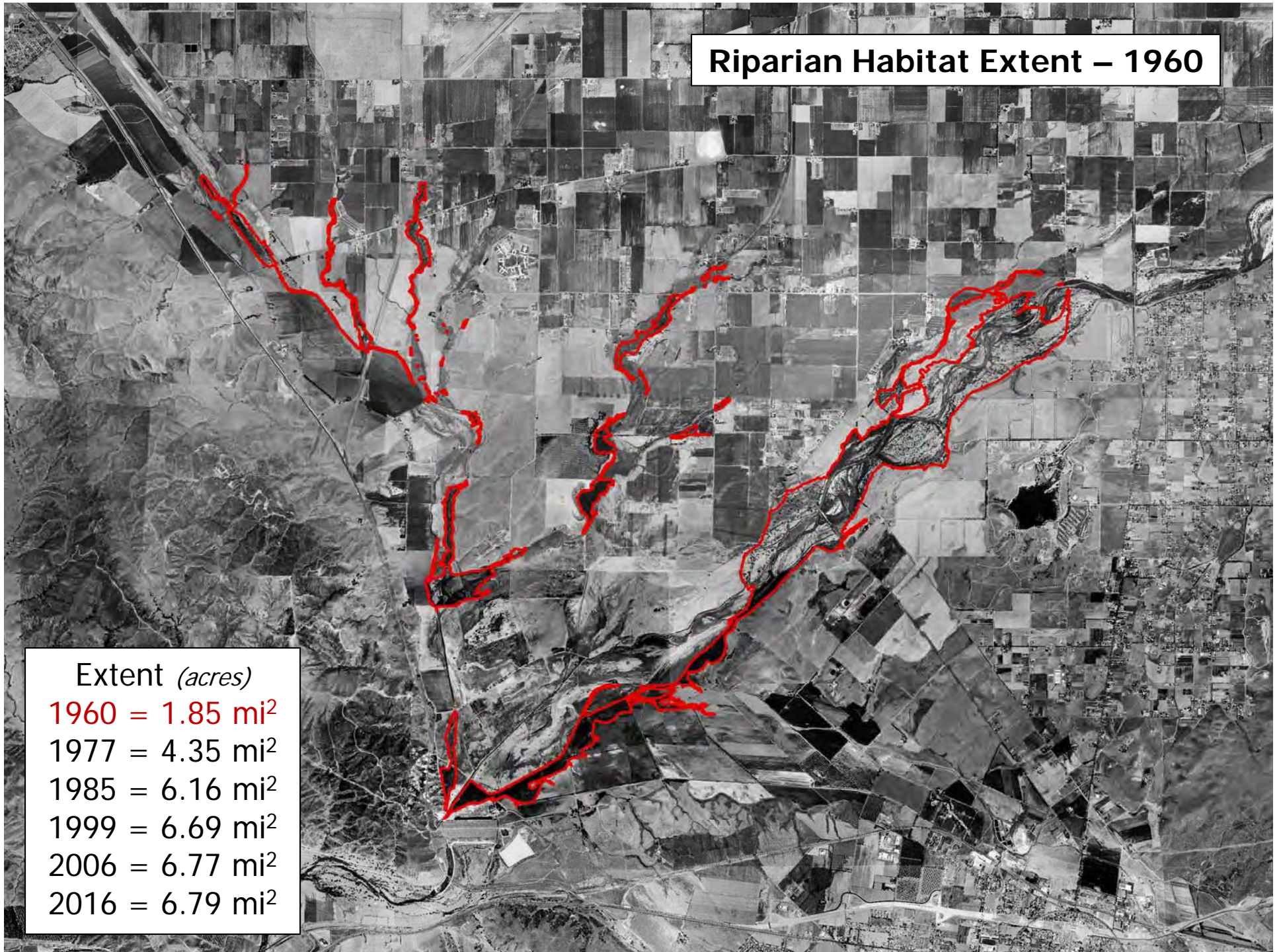




Riparian Habitat Extent – 1960

Extent (*acres*)

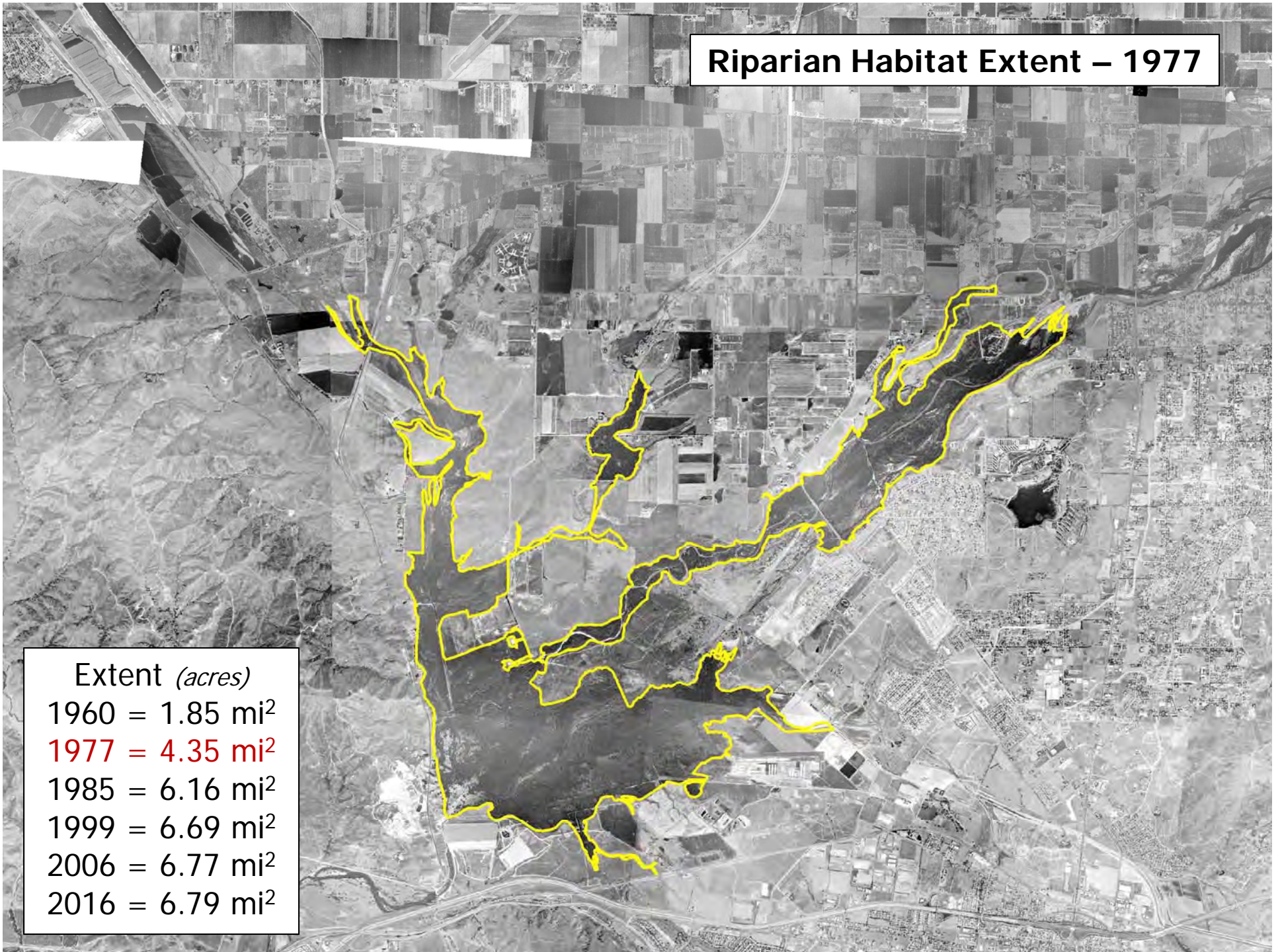
1960	= 1.85 mi ²
1977	= 4.35 mi ²
1985	= 6.16 mi ²
1999	= 6.69 mi ²
2006	= 6.77 mi ²
2016	= 6.79 mi ²



Riparian Habitat Extent – 1977

Extent (*acres*)

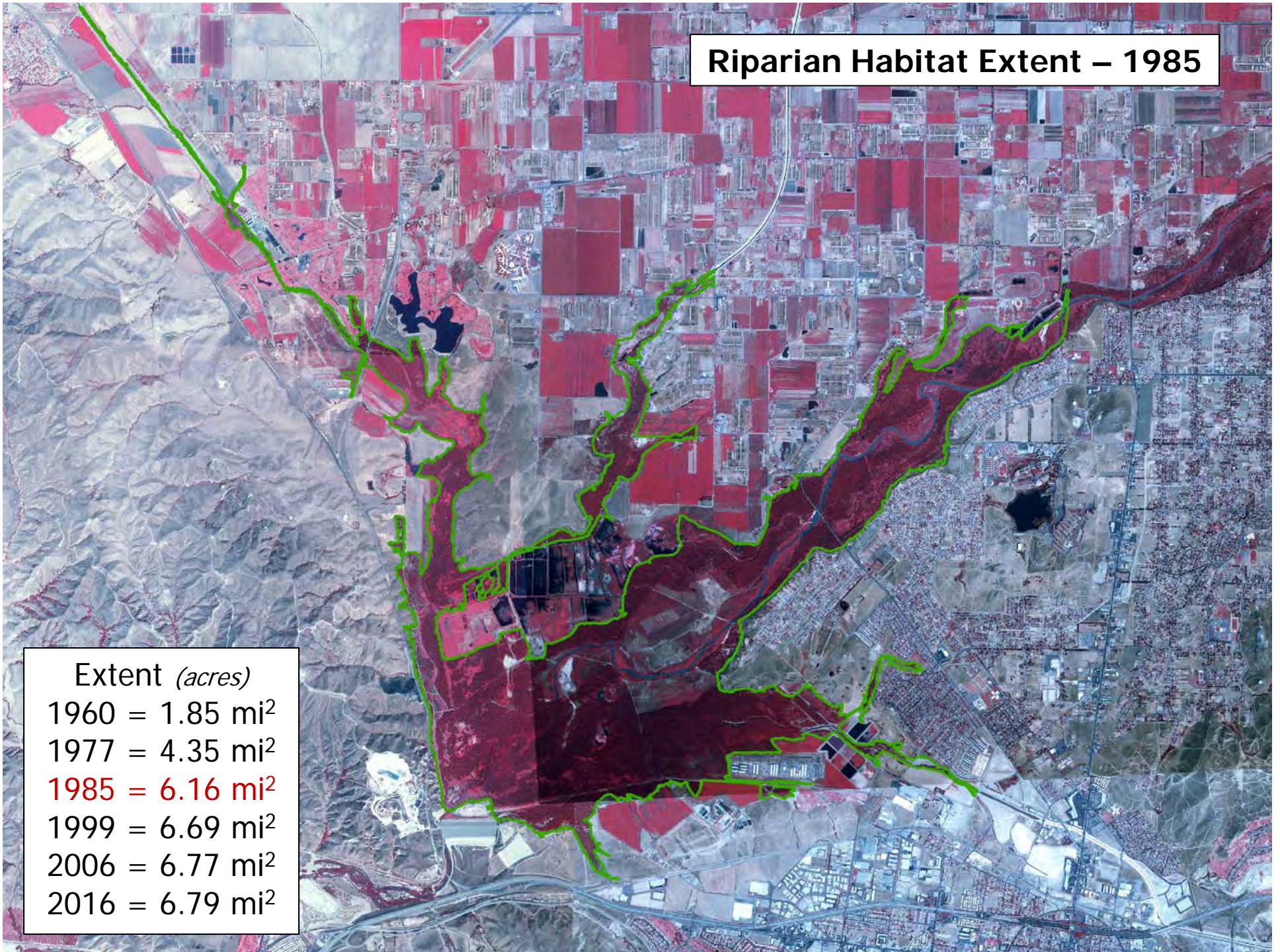
1960	= 1.85 mi ²
1977	= 4.35 mi²
1985	= 6.16 mi ²
1999	= 6.69 mi ²
2006	= 6.77 mi ²
2016	= 6.79 mi ²



Riparian Habitat Extent – 1985

Extent (*acres*)

1960	= 1.85 mi ²
1977	= 4.35 mi ²
1985	= 6.16 mi²
1999	= 6.69 mi ²
2006	= 6.77 mi ²
2016	= 6.79 mi ²





Riparian Habitat Extent – 1999

Extent (*acres*)

1960 = 1.85 mi²

1977 = 4.35 mi²

1985 = 6.16 mi²

1999 = 6.69 mi²

2006 = 6.77 mi²

2016 = 6.79 mi²



Riparian Habitat Extent – 2006

Extent (*acres*)

1960 = 1.85 mi²

1977 = 4.35 mi²

1985 = 6.16 mi²

1999 = 6.69 mi²

2006 = 6.77 mi²

2016 = 6.79 mi²



Riparian Habitat Extent – 2016

Extent (*acres*)

1960 = 1.85 mi²

1977 = 4.35 mi²

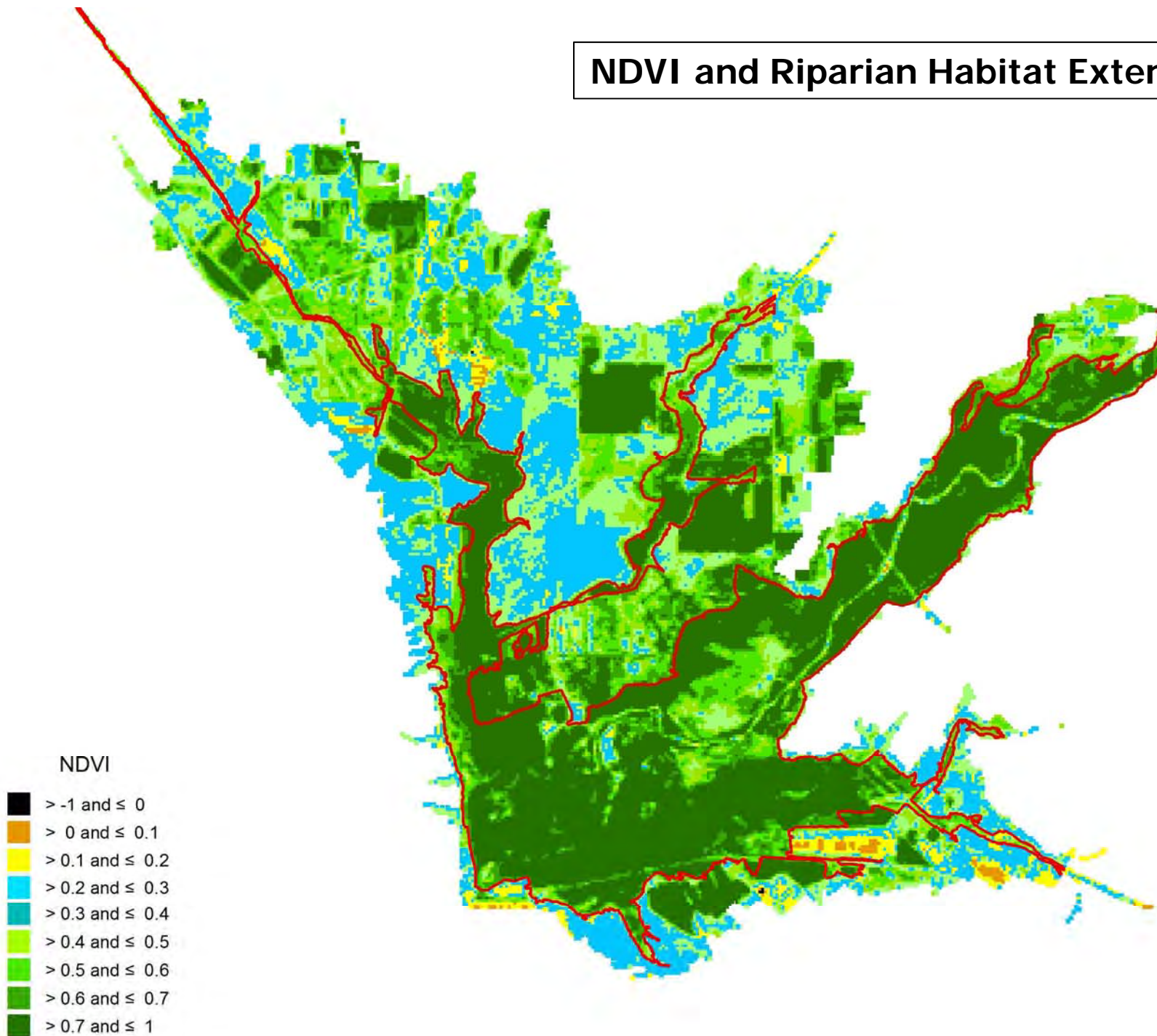
1985 = 6.16 mi²

1999 = 6.69 mi²

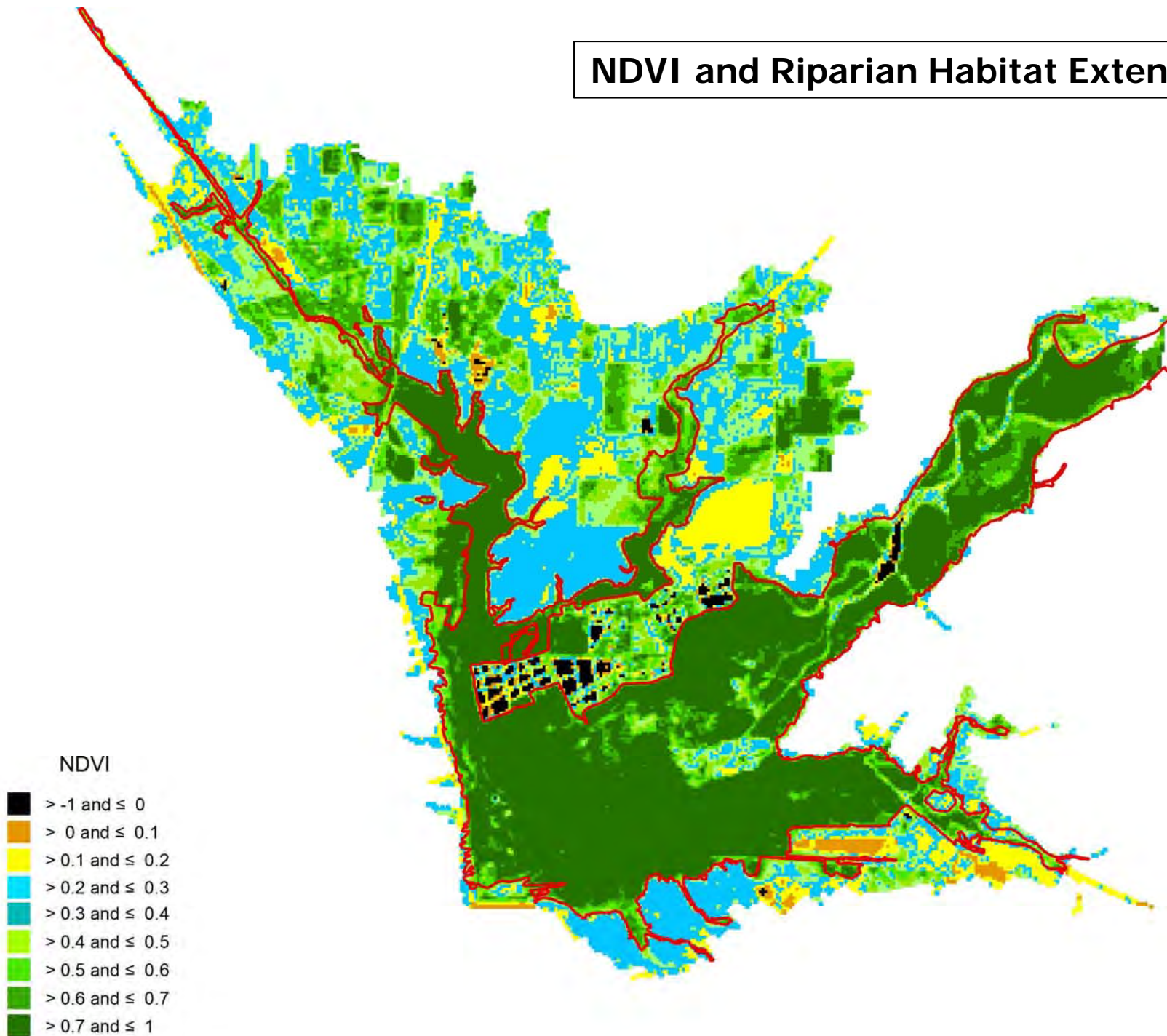
2006 = 6.77 mi²

2016 = 6.79 mi²

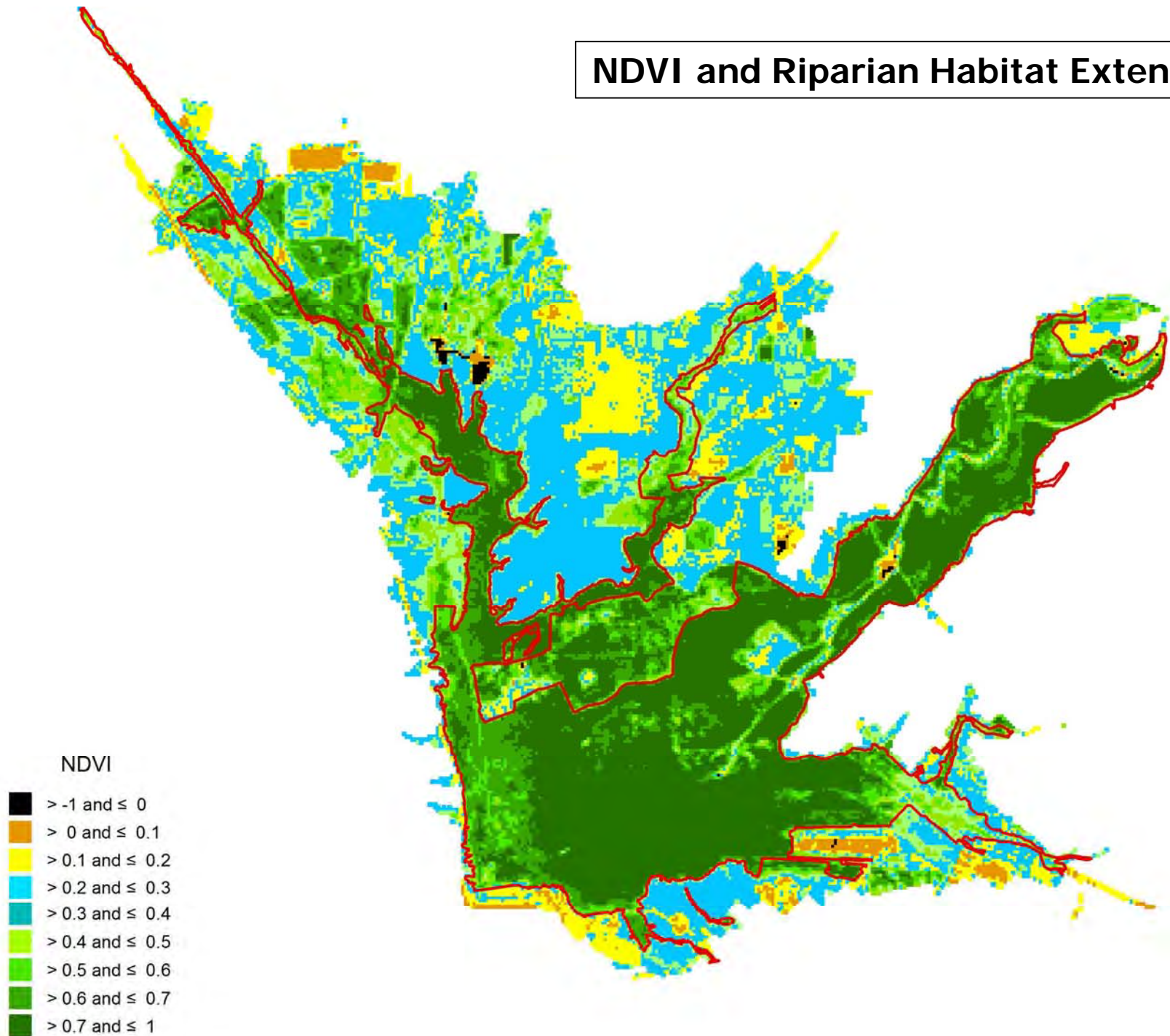
NDVI and Riparian Habitat Extent – 1985



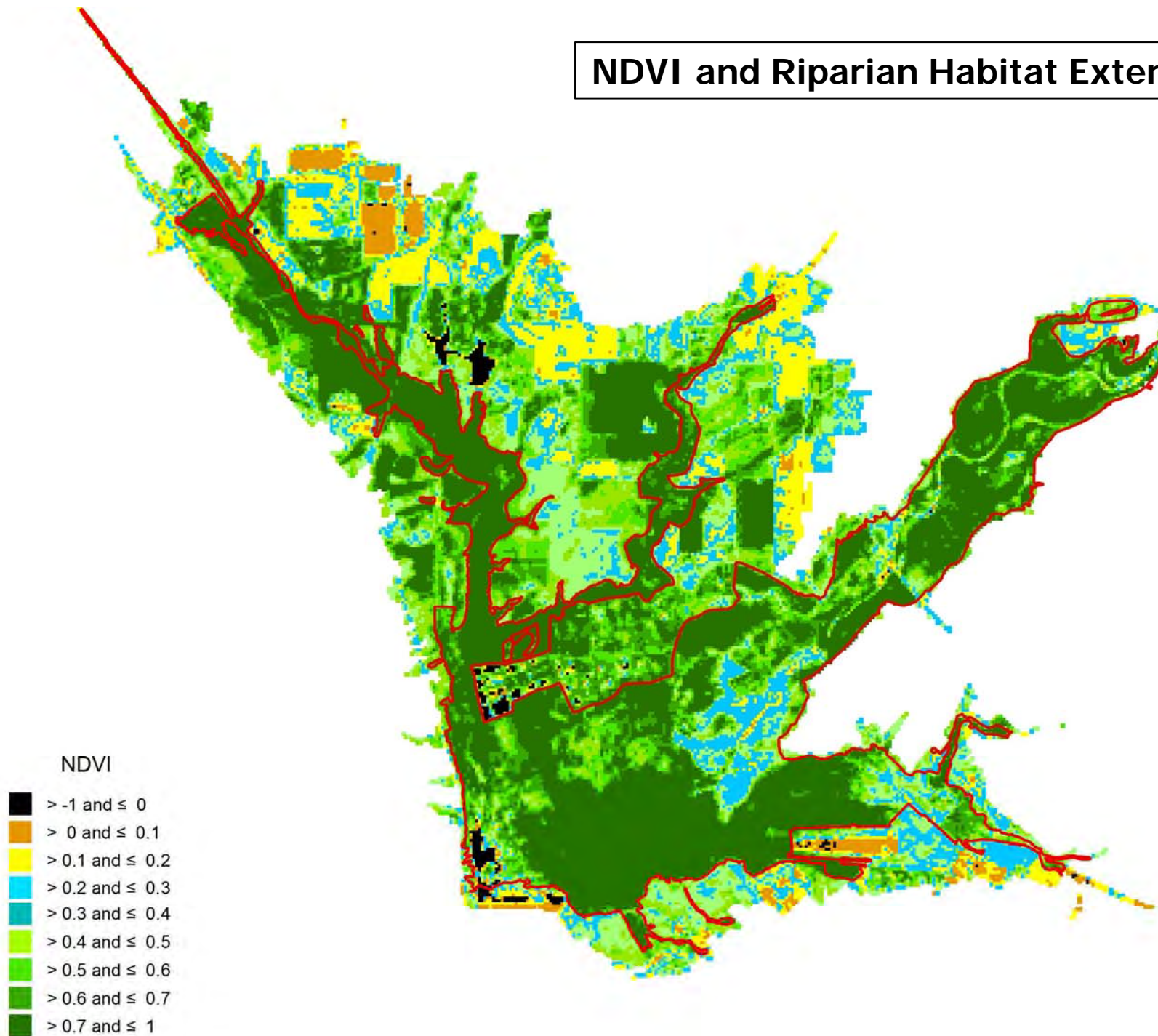
NDVI and Riparian Habitat Extent – 1999



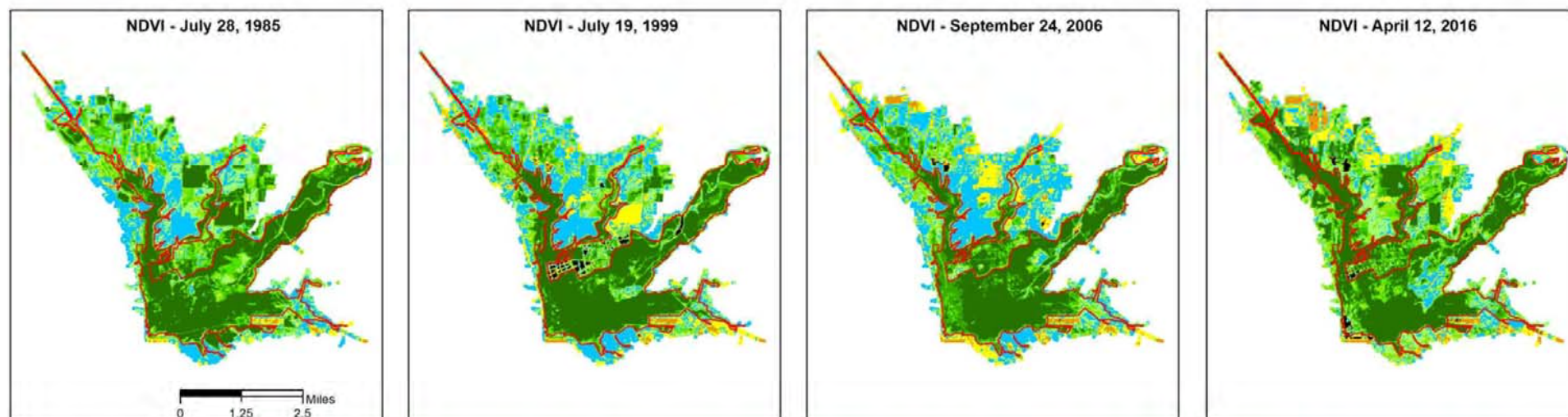
NDVI and Riparian Habitat Extent – 2006



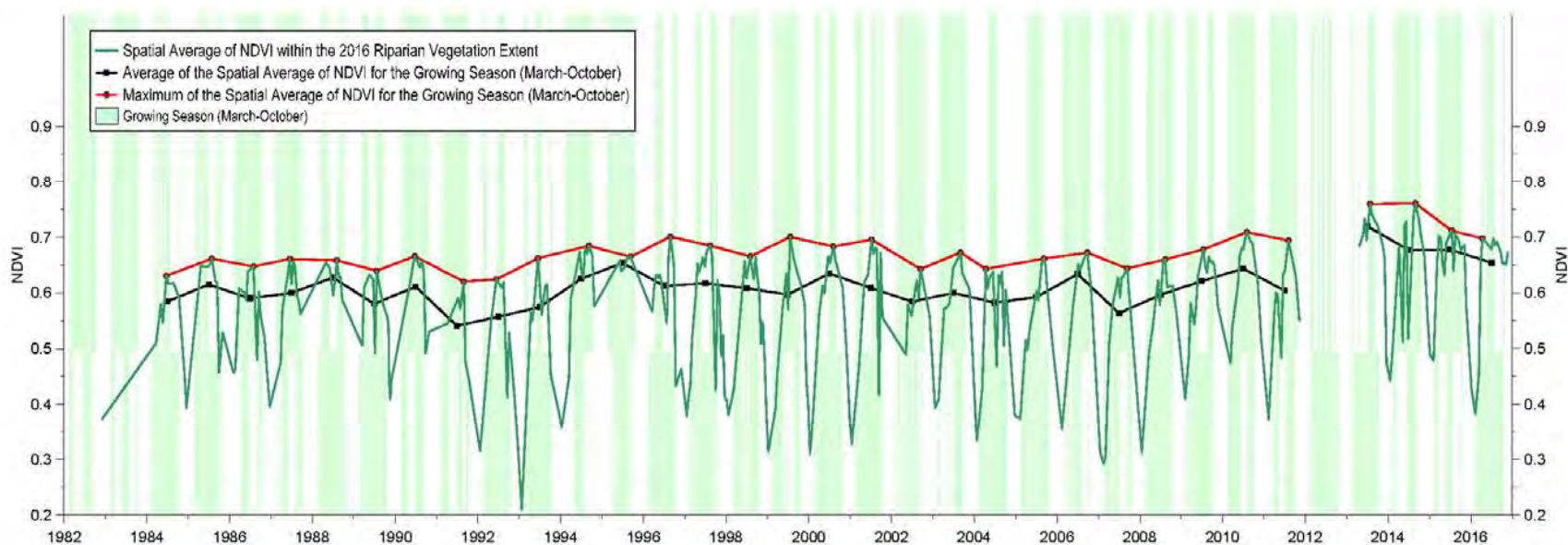
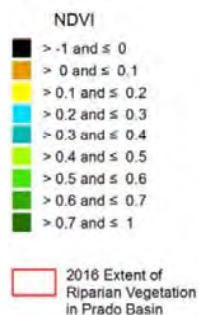
NDVI and Riparian Habitat Extent – 2016



NDVI Analysis – Total Extent of the Riparian Habitat



Map Legend:



Prepared by:



Author: BML
Date: 20170326
Filename: ndvi_time_series_Prado_Spatial_NDVI.gif

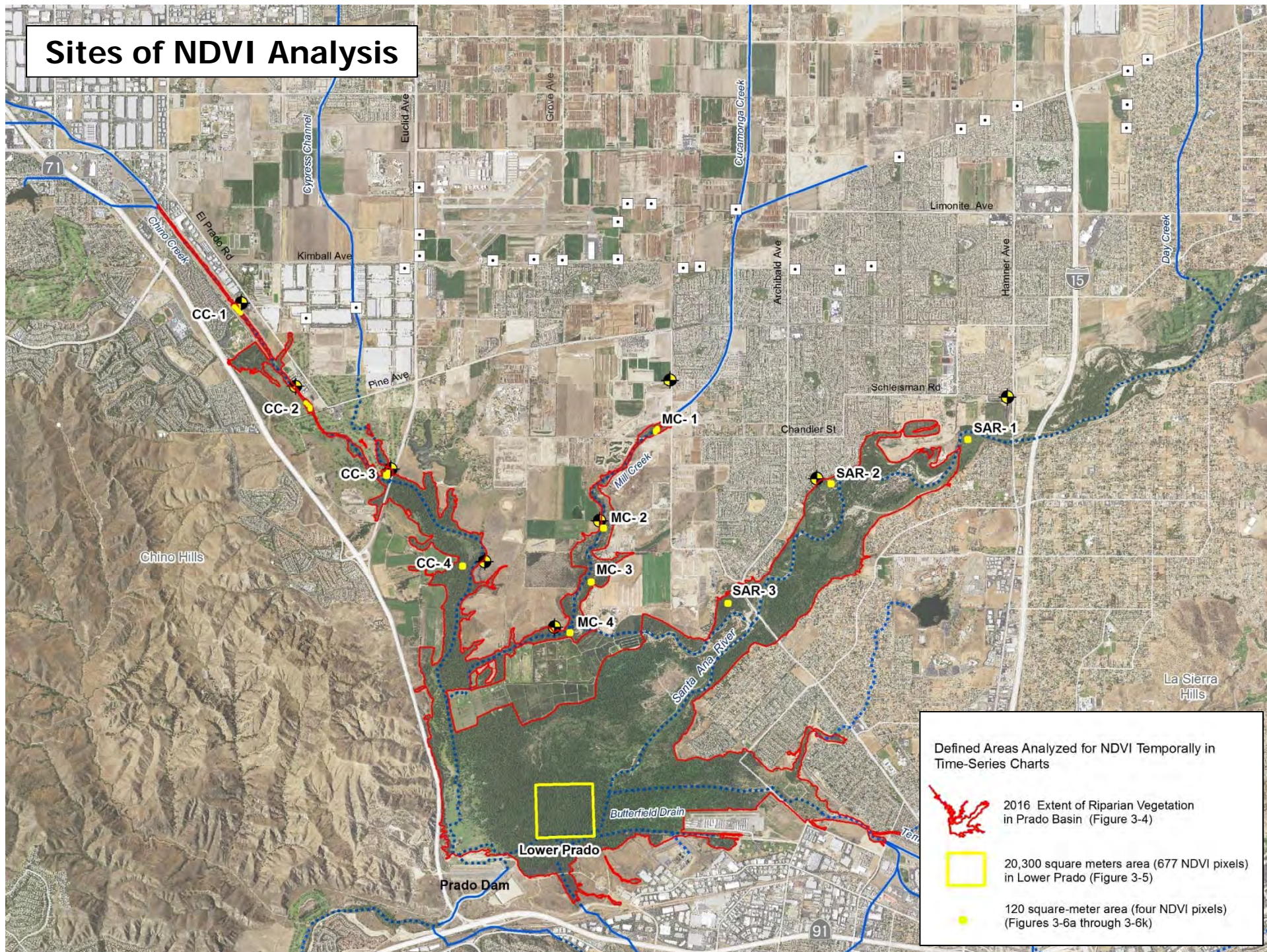
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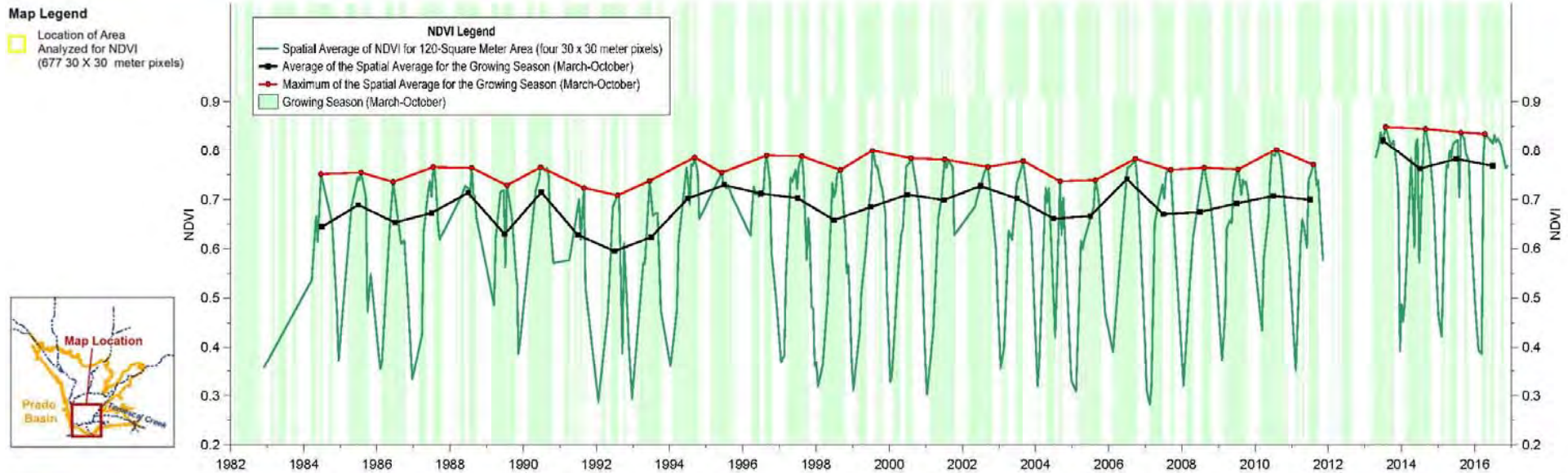
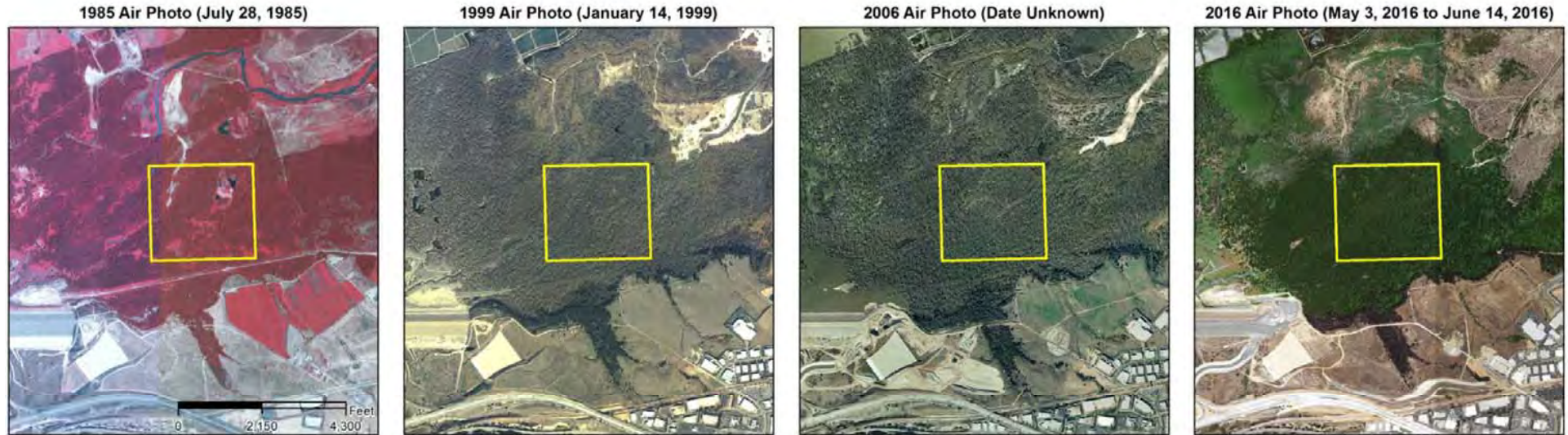
Time Series of NDVI for the
2016 Riparian Vegetation Extent - 1984 to 2016

Figure 3-4

Sites of NDVI Analysis



NDVI Analysis – Lower Prado



Prepared by



Author: MMWRT
Date: 20170414
Filename: ndv_time_series_Lower Prado 3.gif

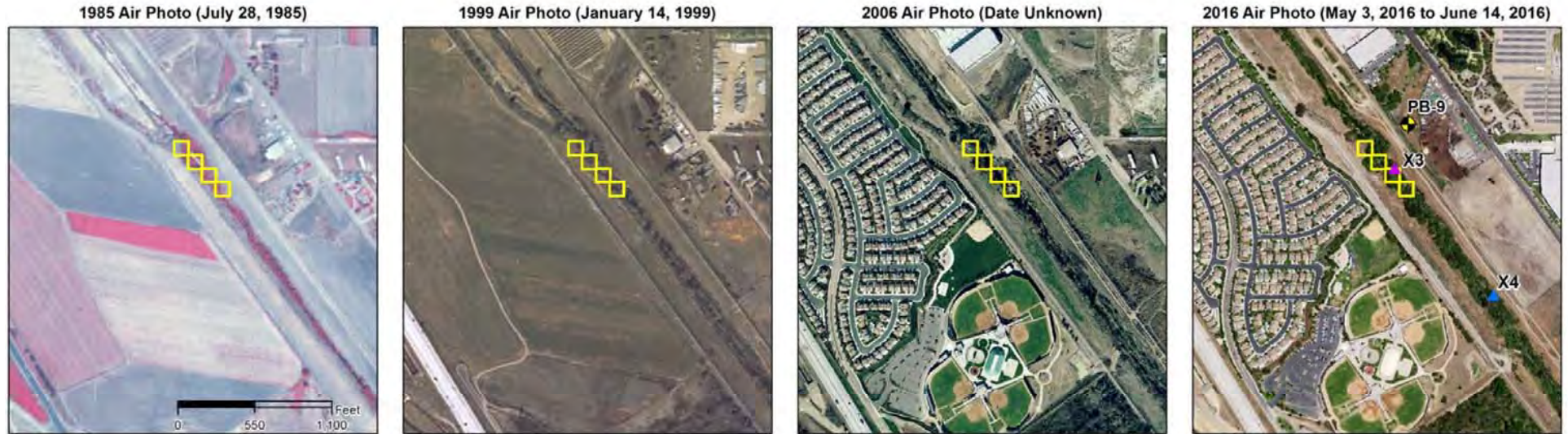
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Time Series of NDVI and Air Photos
Lower Prado Area for 1984 to 2016

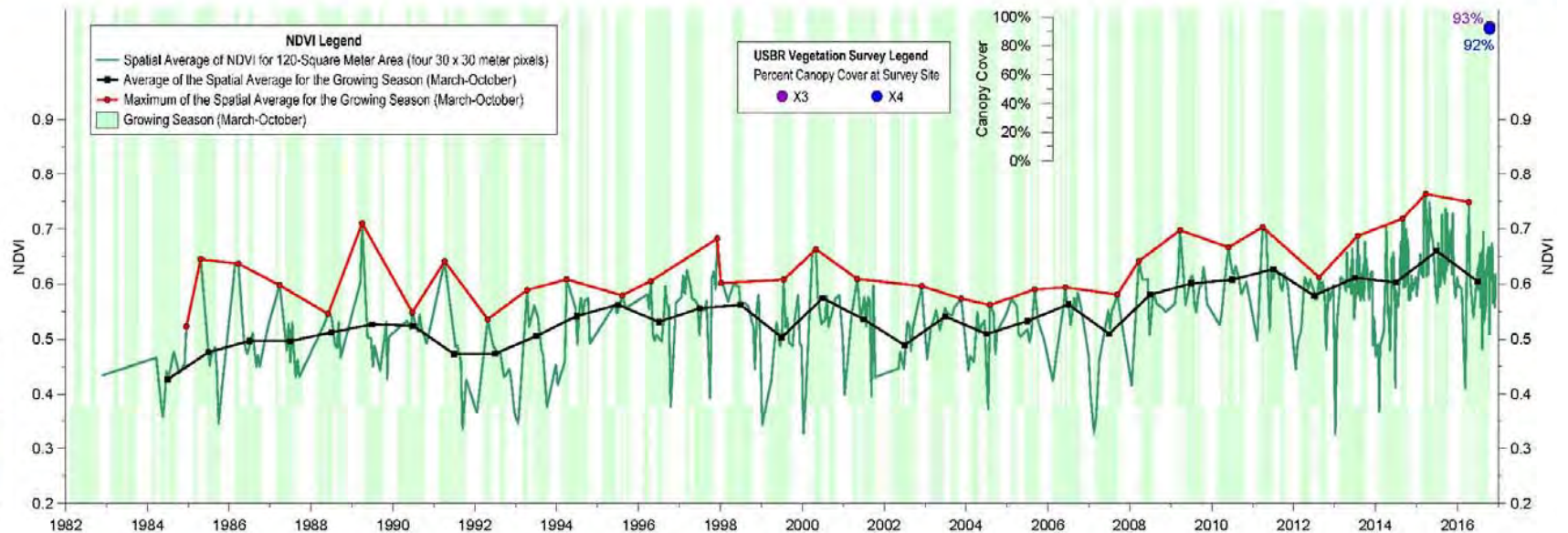
Figure 3-5

NDVI Analysis – Chino Creek 1



Map Legend

- NDVI 30 x 30 Meter Pixel
- USBR Vegetation Survey Sites
 - X3
 - X4
- PBHSP Monitoring Well Site



Prepared by:



Author: YAMNRT
Date: 20170314
Filename: ndvi_line_series_Chino_Creek1.gif

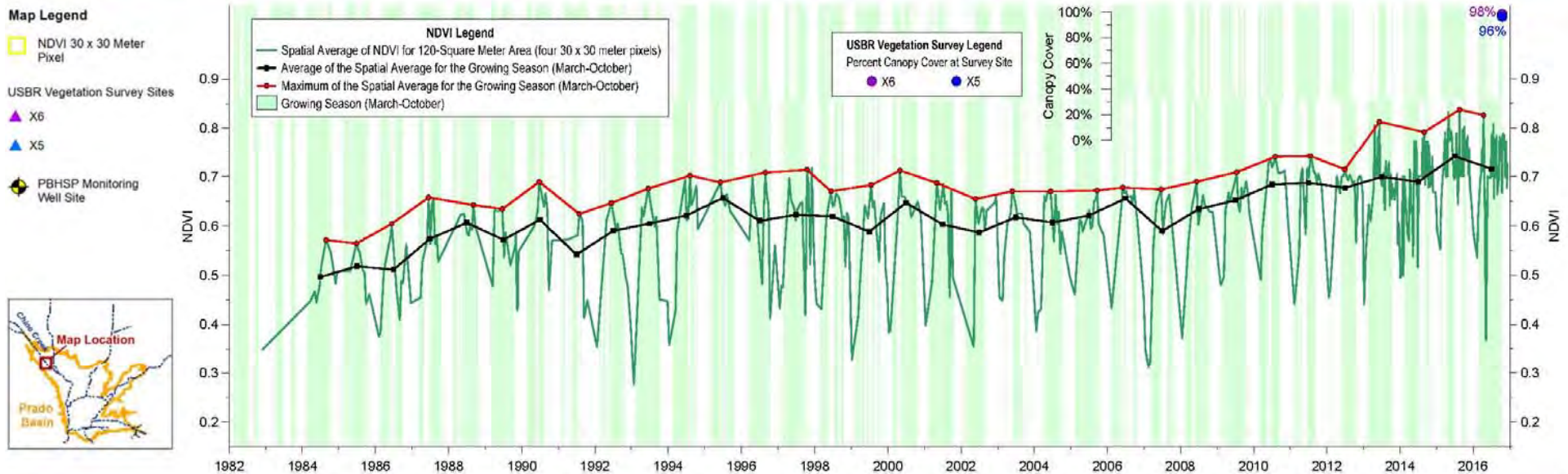
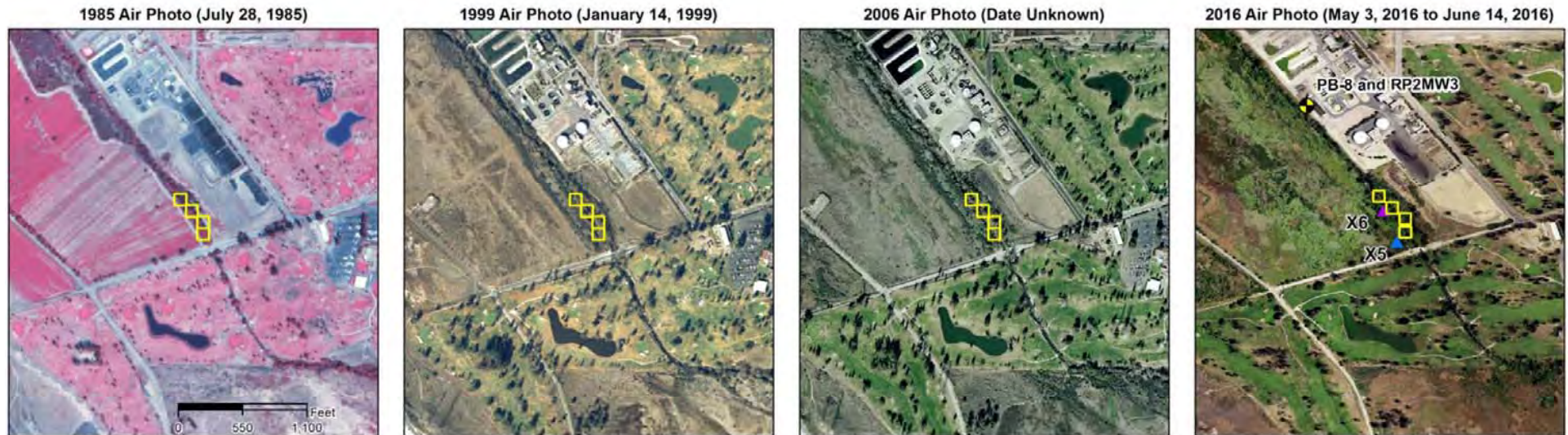
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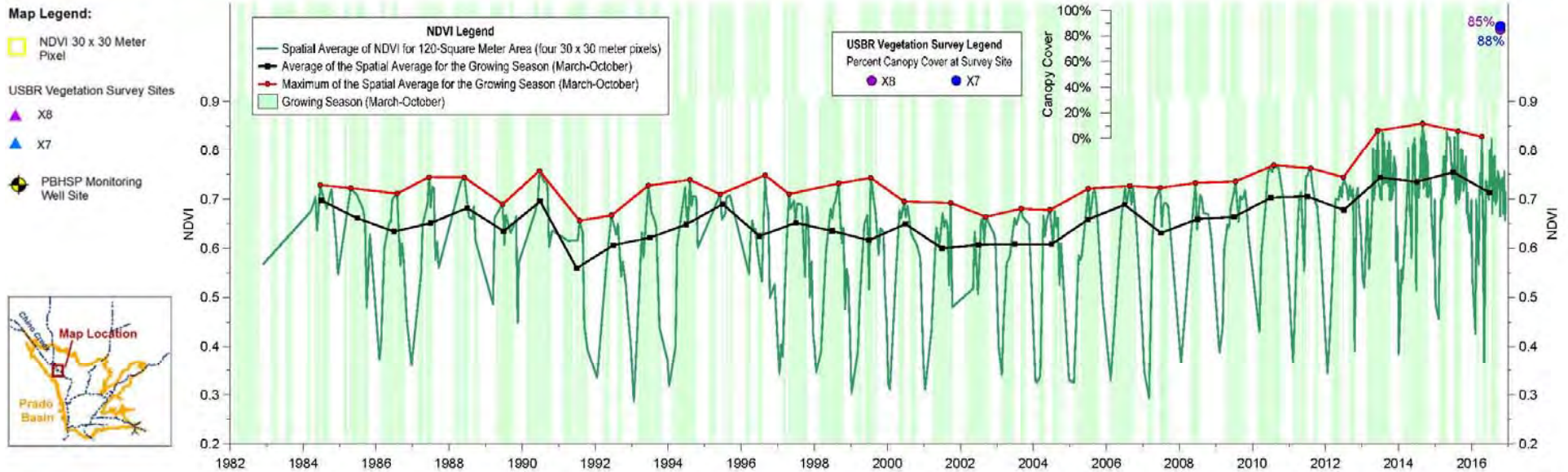
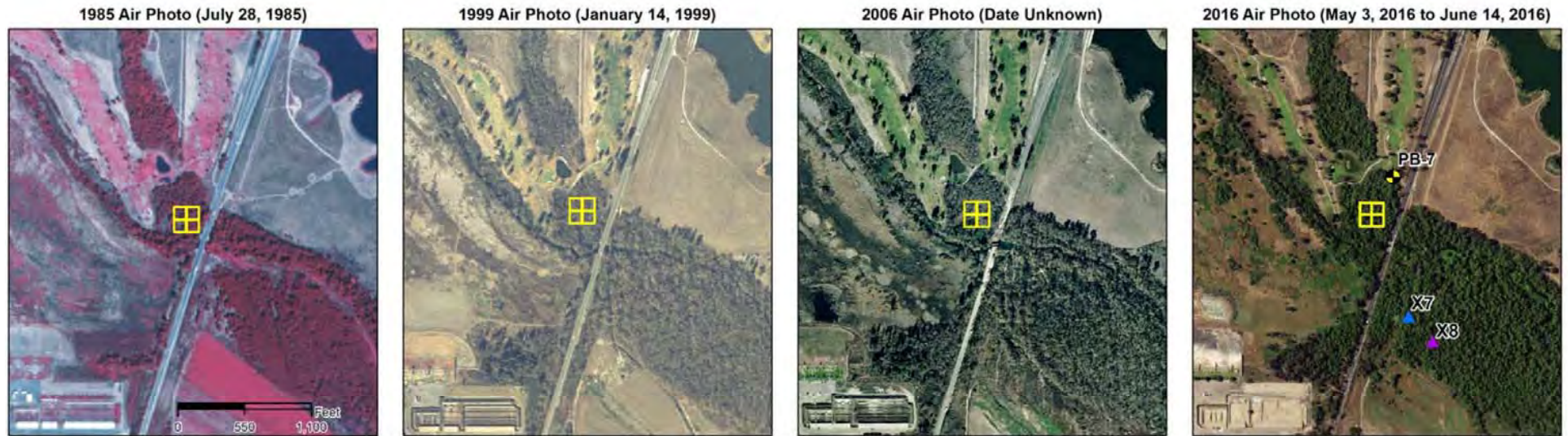
Time Series of NDVI and Air Photos
CC-1 Area for 1984 to 2016

Figure 3-6a

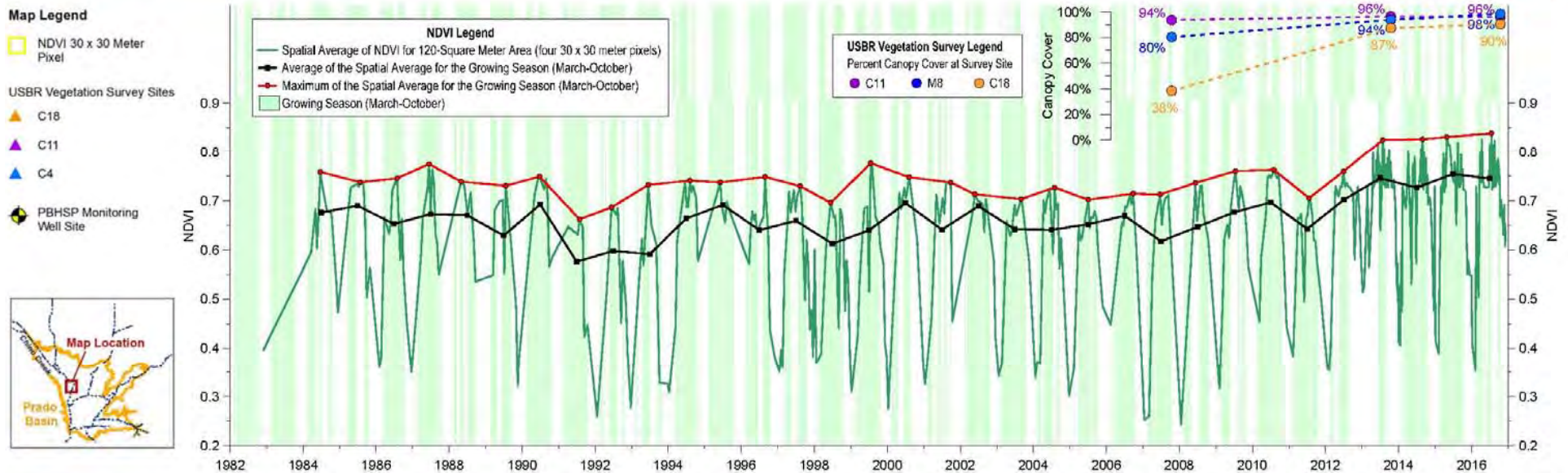
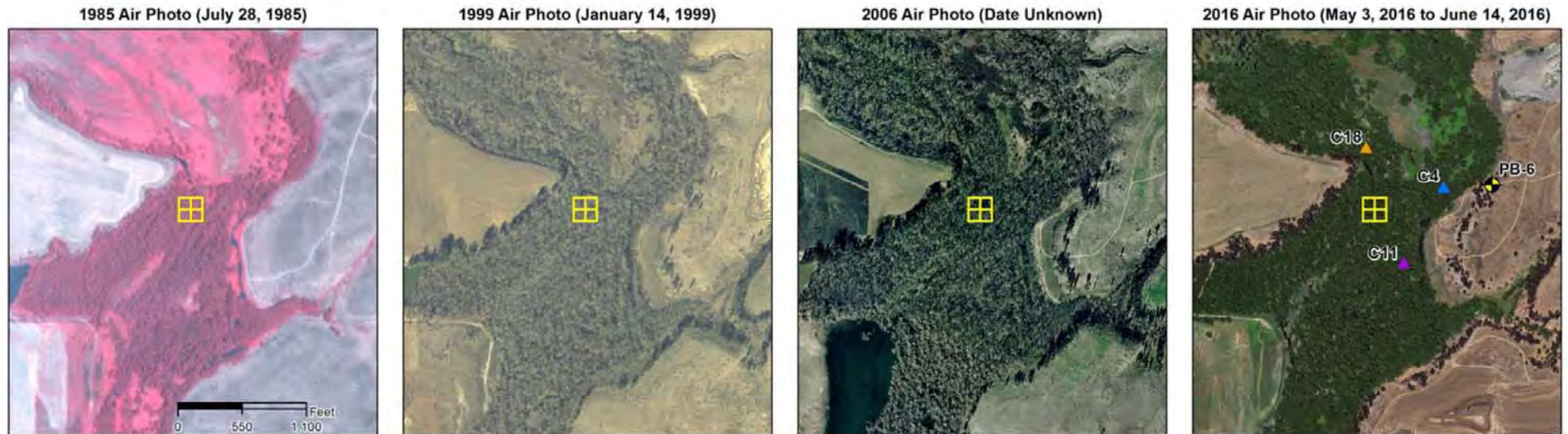
NDVI Analysis – Chino Creek 2



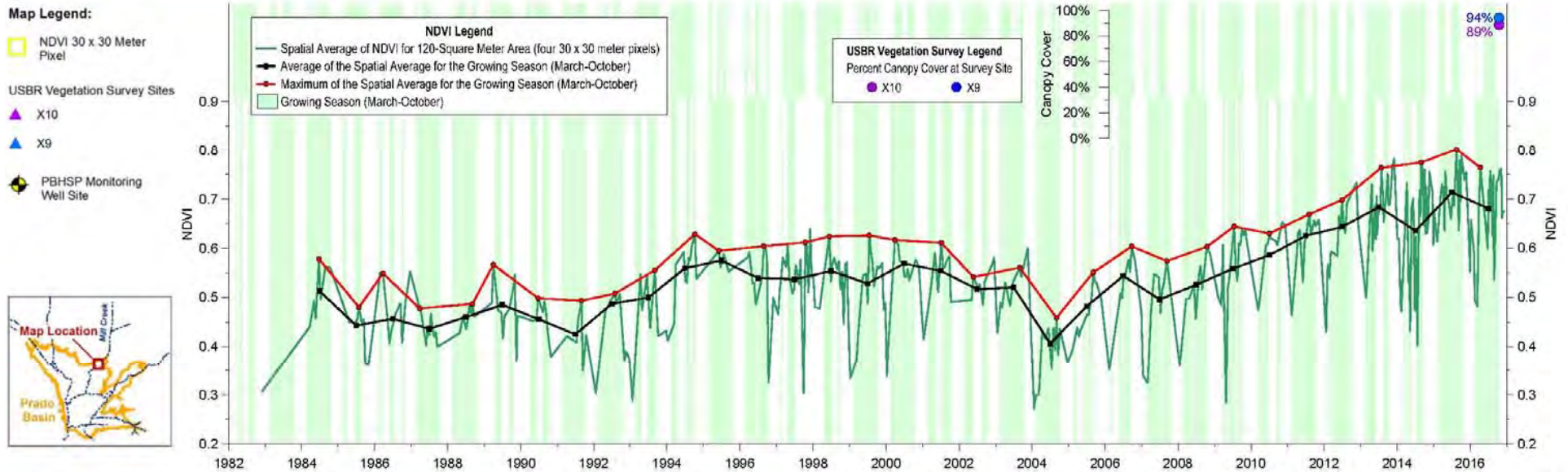
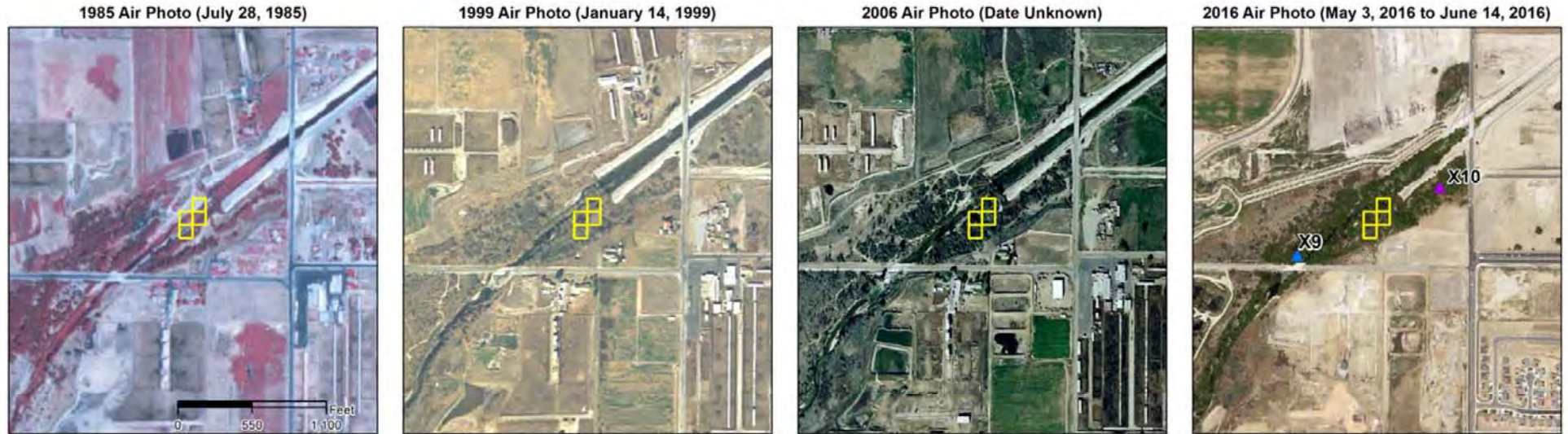
NDVI Analysis – Chino Creek 3



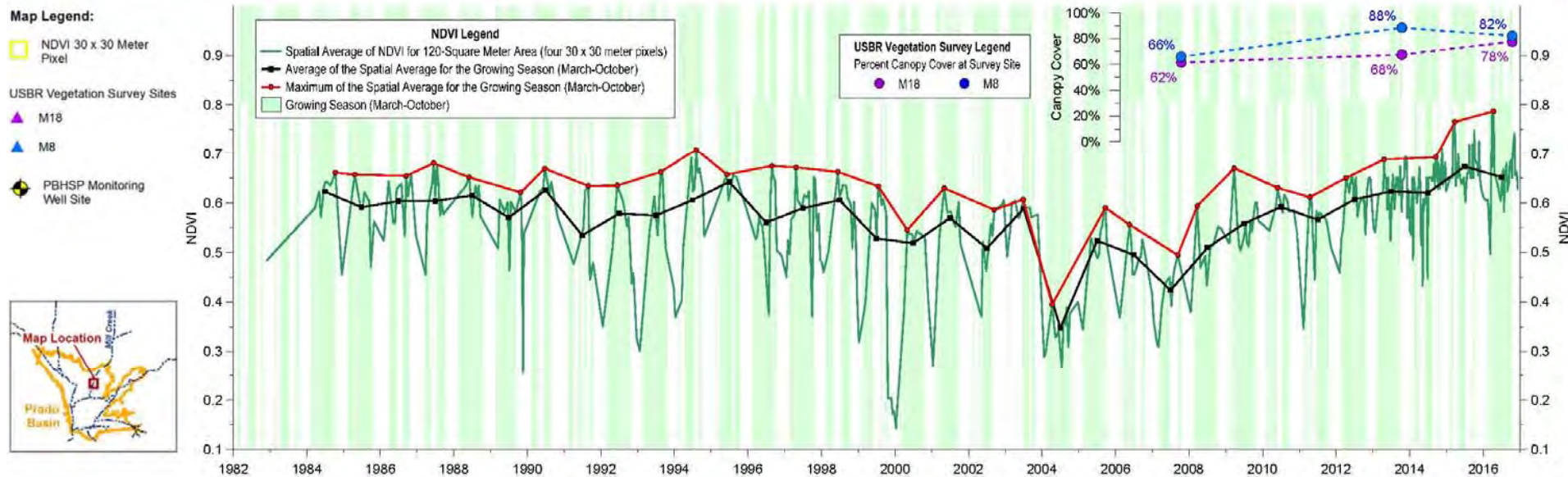
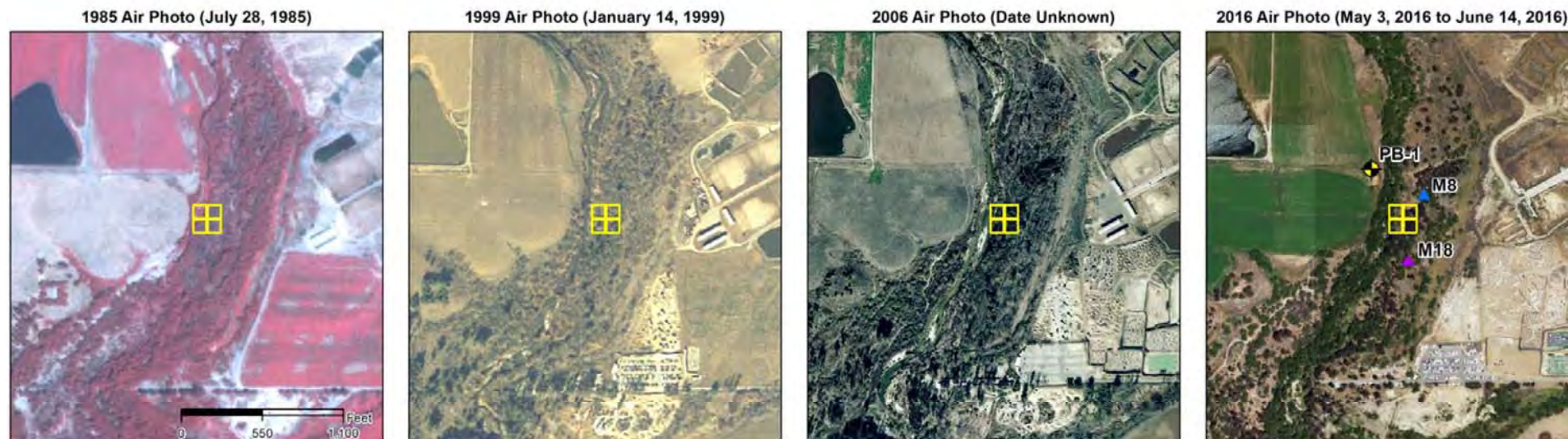
NDVI Analysis – Chino Creek 4



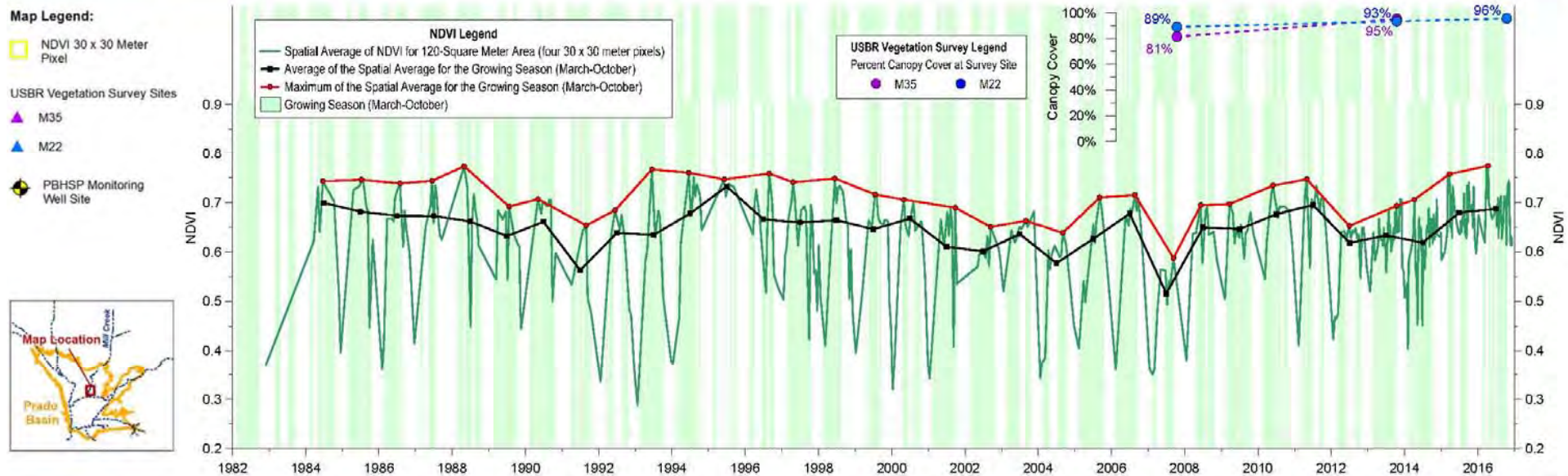
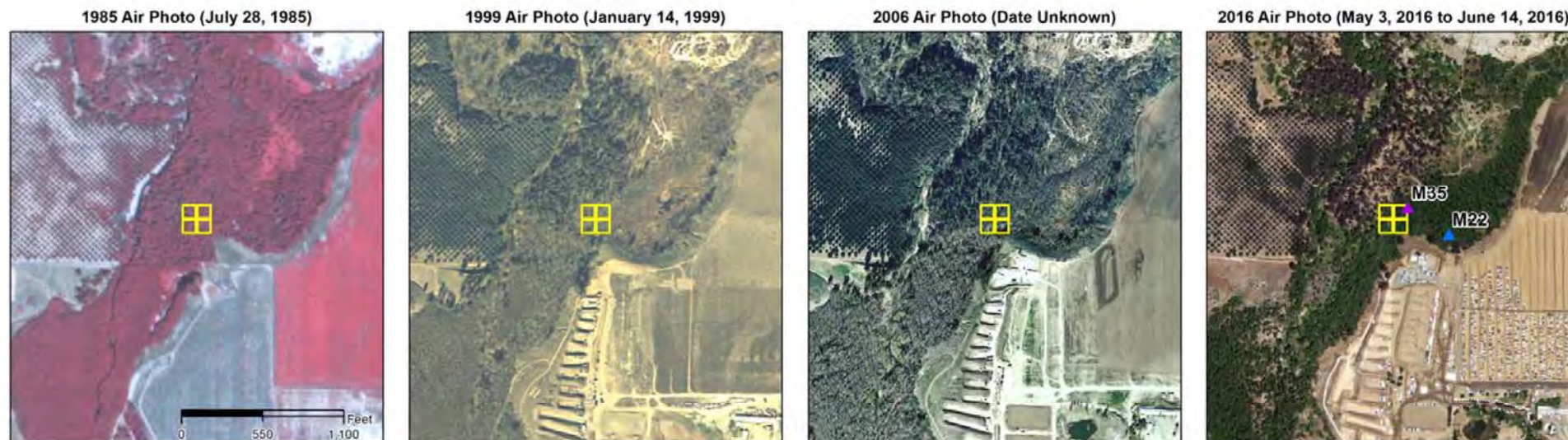
NDVI Analysis – Mill Creek 1



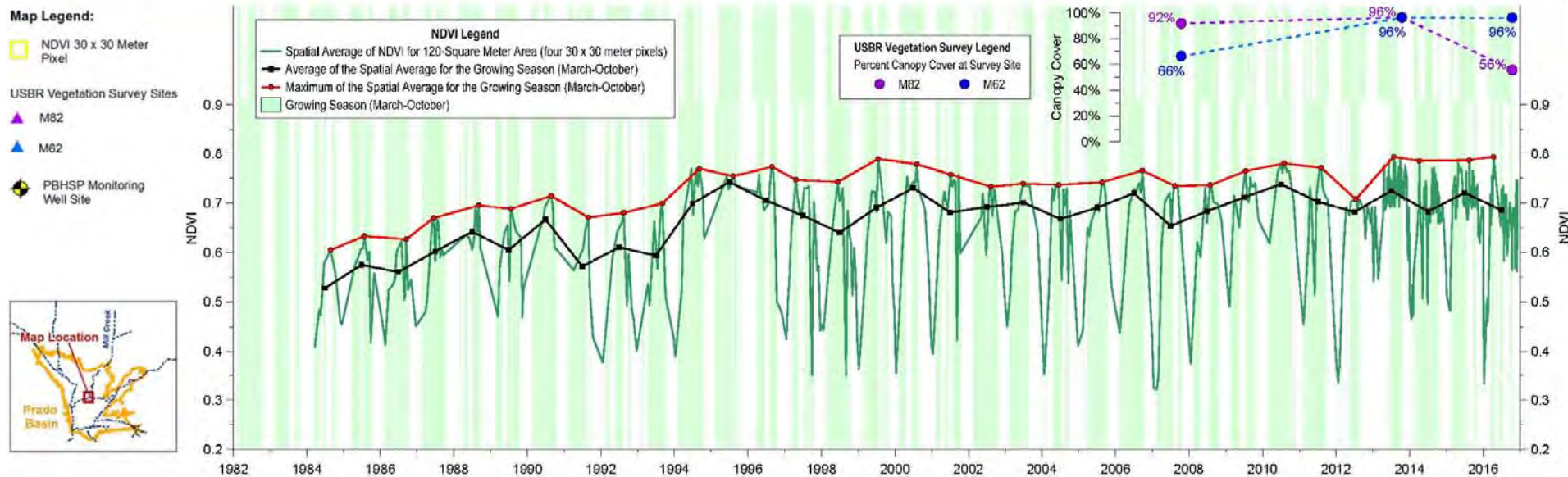
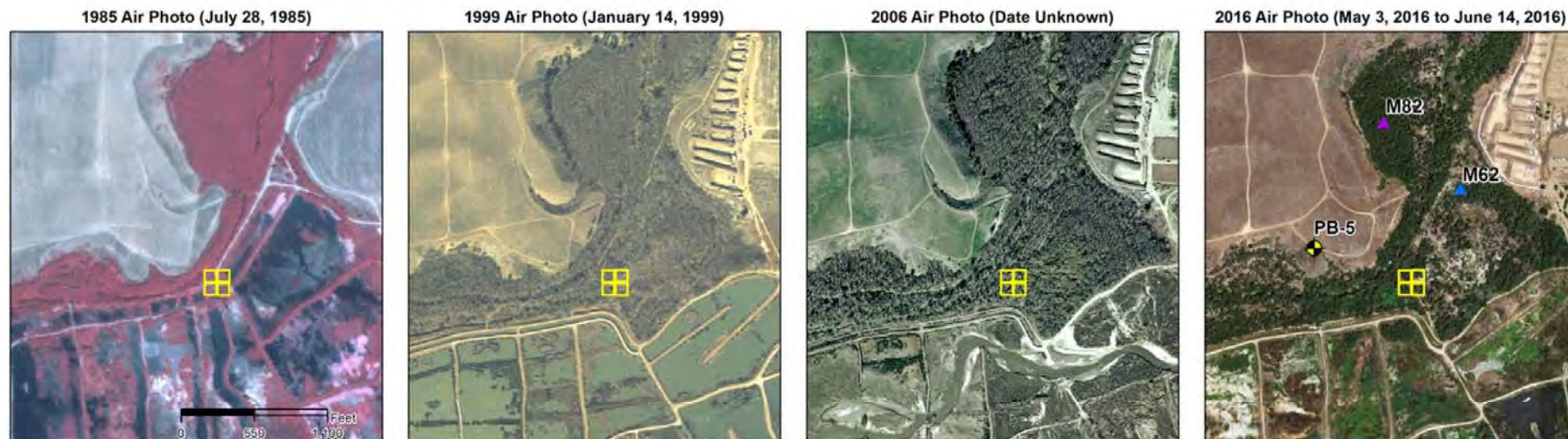
NDVI Analysis – Mill Creek 2



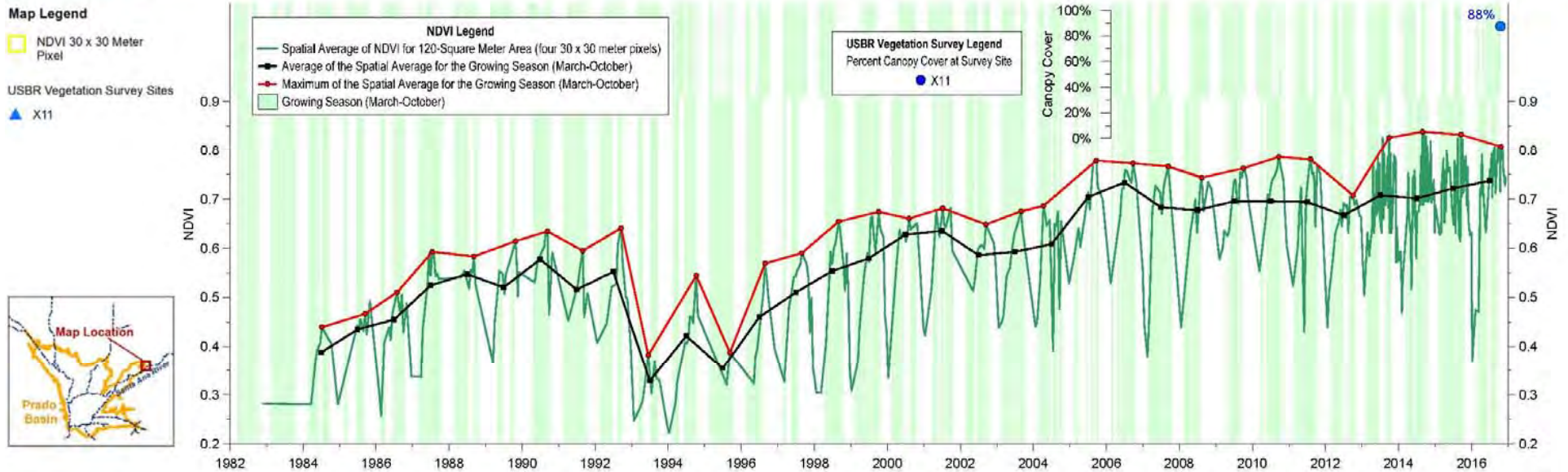
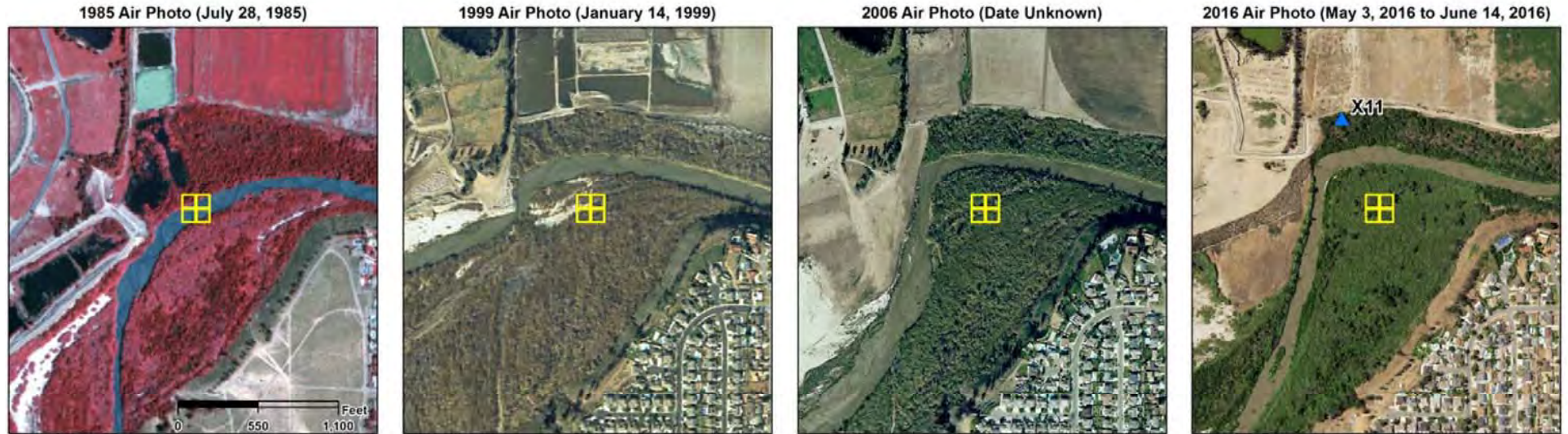
NDVI Analysis – Mill Creek 3



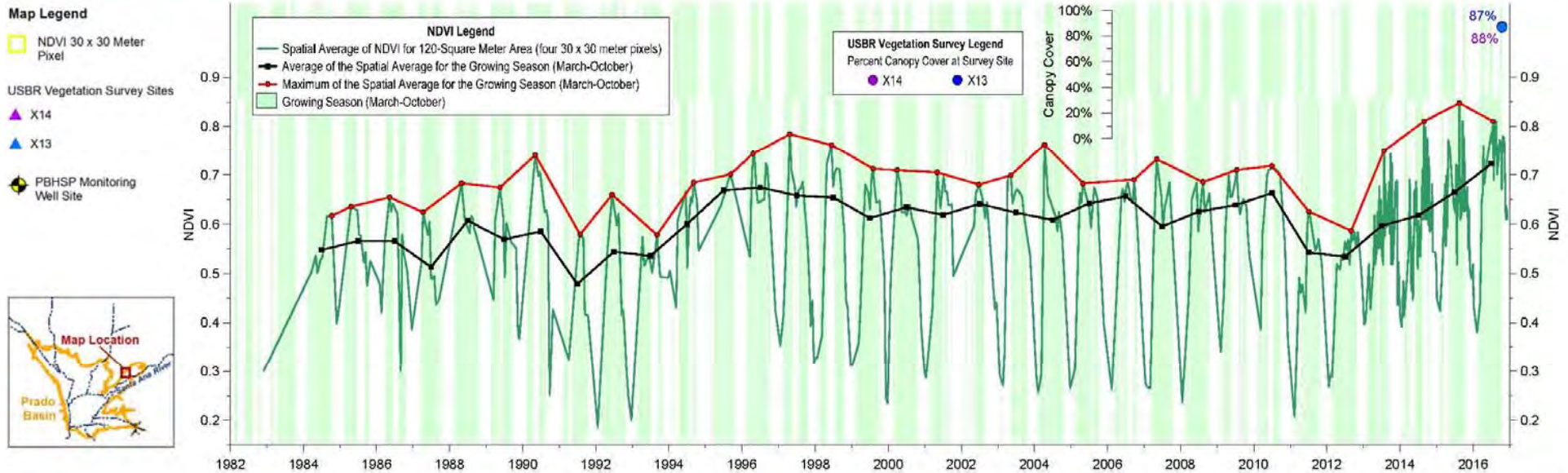
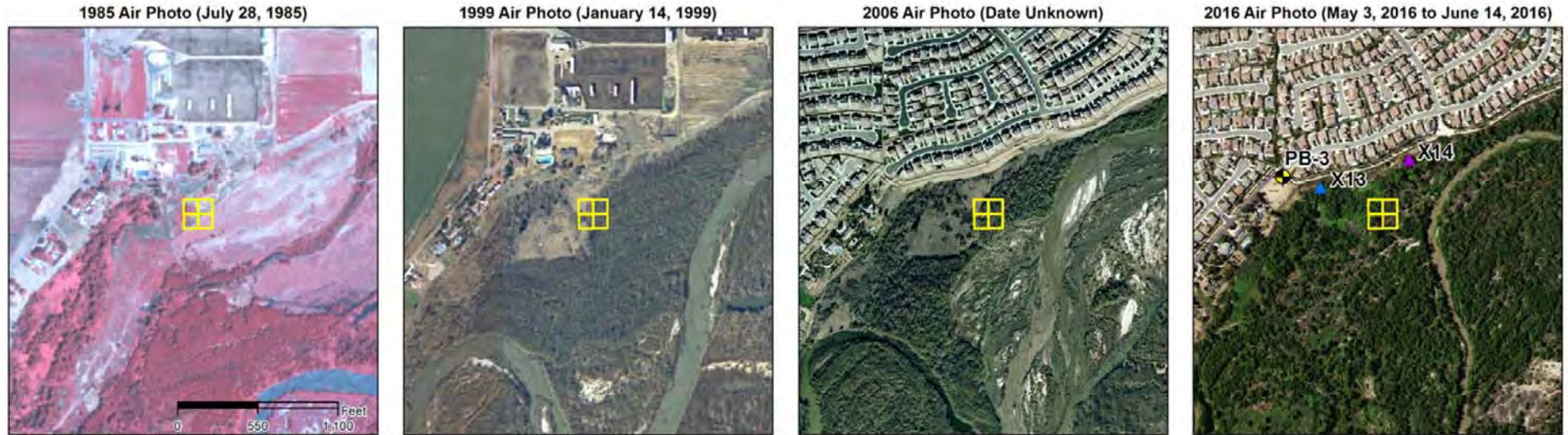
NDVI Analysis – Mill Creek 4



NDVI Analysis – SAR 1



NDVI Analysis – SAR 2

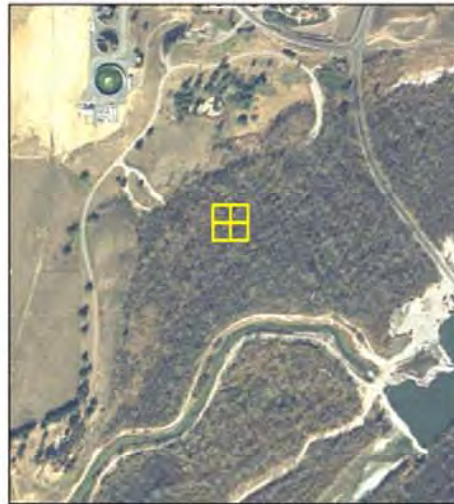


NDVI Analysis – SAR 3

1985 Air Photo (July 28, 1985)



1999 Air Photo (January 14, 1999)



2006 Air Photo (Date Unknown)

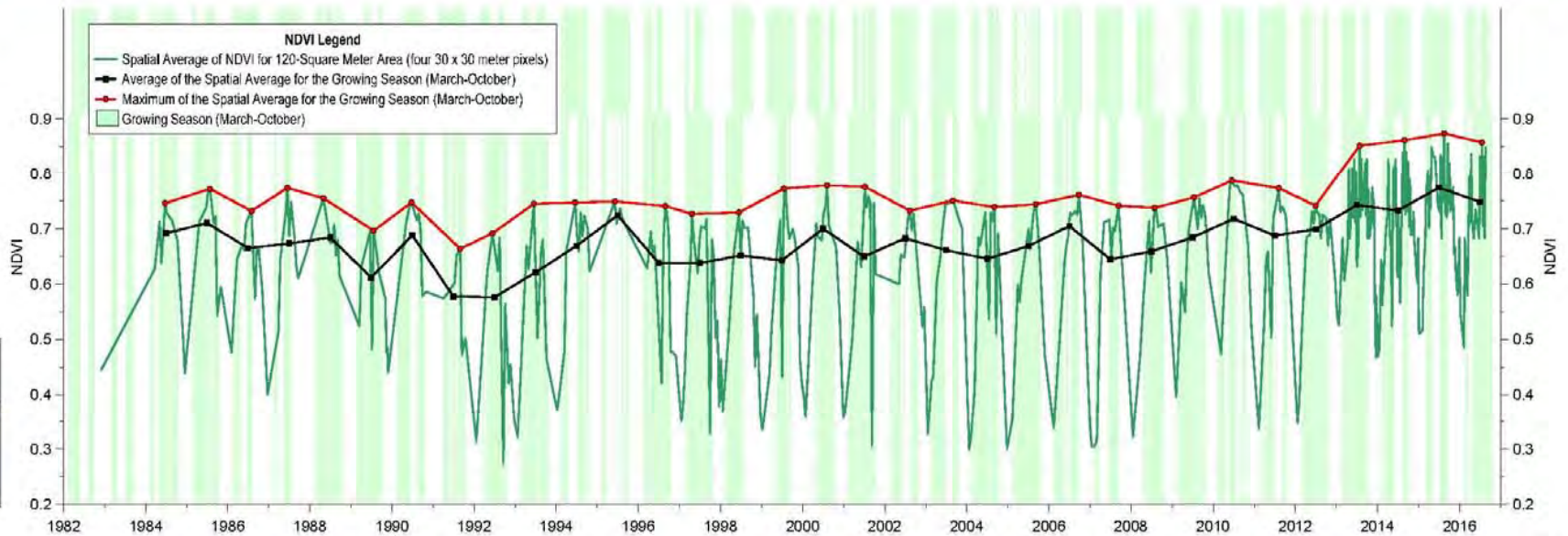


2016 Air Photo (May 3, 2016 to June 14, 2016)



Map Legend

NDVI 30 x 30 Meter Pixel



Prepared by



Author: VAW/RT
Date: 20170414
Filename: ndvi_time_series_SAR3.gri

2016 Annual Report
Prado Basin Habitat Sustainability Committee



Time Series of NDVI and Air Photos
SAR-3 Area for 1984 to 2016

Figure 3-6k

Table 1
Work Breakdown Structure, Cost Estimate, and Schedule
PBHSP Monitoring Program – FY2017-18

Task Description	Labor Total		Other Direct Costs					Notes	Totals				
	Person Days	Total	Travel	Equip. Rental	Lab	Outside Pro	Total		FY 2017-18	FY 2016-17	Difference	IEUA Portion FY 2017-18	CBWM Portion FY 2017-18
Task 1: Groundwater Level Monitoring Program	10.4	\$11,152					\$779		\$11,931	\$11,721	\$210	-	\$11,931
1.1 Collect Transducer Data from PBHSP Wells (Quarterly)	4.8	\$4,304	\$587	\$192			\$779		\$5,083				
1.2 Collect, Check, and Upload Transducer Data from PBHSP Wells (Quarterly)	5.6	\$6,848					\$0		\$6,848				
Task 2: Groundwater Quality Monitoring Program	25.6	\$24,400					\$24,655		\$49,055	\$77,160	-\$28,105	-	\$49,055
2.1 Collect Groundwater-Quality from PBHSP Wells (Quarterly)	18.4	\$15,472	\$2,035	\$4,120	\$18,500		\$24,655		\$40,127				
2.2 Check and Upload Groundwater Quality Field and Lab Data from PBHSP Wells (Quarterly)	7.2	\$8,928					\$0		\$8,928				
Task 3: Surface Water Monitoring Program	3.2	\$3,744					\$0		\$3,744	\$3,230	\$514	-	\$3,744
3.1 Quality Data from POTWs, and Dam level data from the ACOE (Annual)	2.2	\$2,608					\$0		\$2,608				
3.2 Collect, Check, and Upload Surface Water Discharge and Quality Data from USGS gaging stations (Annual)	1.0	\$1,136					\$0		\$1,136				
Task 4: Riparian Habitat Monitoring Program	28.8	\$40,342					\$10,000		\$50,342	\$199,794	-\$149,452	\$25,171.0	\$25,171.0
4.1 Manage and Perform Custom Flight to Collect a High-Resolution Air Photo of the Prado Basin Region	1.0	\$1,816				\$10,000	\$10,000	1	\$11,816				
4.2 Collect, Check, Catalog, and Digitize the 2017 Air Photo for Prado Basin Region	4.3	\$5,682					\$0		\$5,682				
4.3 Collect, Check, and Upload 2017 Landsat NDVI Data in the Prado Basin	3.8	\$5,262					\$0		\$5,262				
4.4 Collect, Check, and Upload Historical Landsat NDVI Data in the Prado Basin	12.2	\$16,074					\$0		\$16,074				
4.5 Design a Site-Specific Vegetation Monitoring Program to Ground-Truth NDVI data	7.5	\$11,508					\$0		\$11,508				
Task 5: Climate Monitoring Program	1.0	\$1,456					\$300		\$1,756	\$1,368	\$388	\$878.20	\$878.20
5.1 Collect, Check, and Upload Climatic Data (Annual)	1.0	\$1,456				\$300	\$300		\$1,756				
Task 6: Prepare Annual Report of the PBHSC	60.5	\$90,872					\$210		\$91,082	\$141,436	-\$50,354	\$45,541.0	\$45,541.0
6.1 Analyze Data and Prepare Admin Draft Report for CBWM/IEUA	47.0	\$70,308					\$0		\$70,308				
6.2 Meet with CBWM/IEUA to Review Admin Draft Report	2.5	\$4,148	\$105				\$105		\$4,253				
6.3 Incorporate CBWM/IEUA Comments and Prepare Draft Report: Submit Draft Report to PBHSC	5.0	\$7,200					\$0		\$7,200				
6.4 Meet with PBHSC to Review Draft Report	3.0	\$4,898	\$105				\$105		\$4,993				
6.5 Incorporate PBHSC Comments and Finalize Report	3.0	\$4,328					\$0		\$4,328				
Task 7: Project Management and Administration	11.8	\$18,898					\$105		\$19,003	\$18,444	\$559	\$9,501.30	\$9,501.30
7.1 Ad-Hoc Meetings (one meeting)	3.0	\$4,888	\$105				\$105		\$4,993				
7.2 Prepare Scope and Budget for FY 2018-19	4.0	\$6,368					\$0		\$6,368				
7.3 Project Administration and Financial Reporting	4.8	\$7,642					\$0		\$7,642				
Totals	267	\$190,864	\$2,350	\$4,120	\$18,500	\$10,300	\$36,049		\$226,913	\$453,153	-\$226,240	\$81,092	\$145,822

1- This is half of the cost for the outside professional. OCWD will be paying the other half.

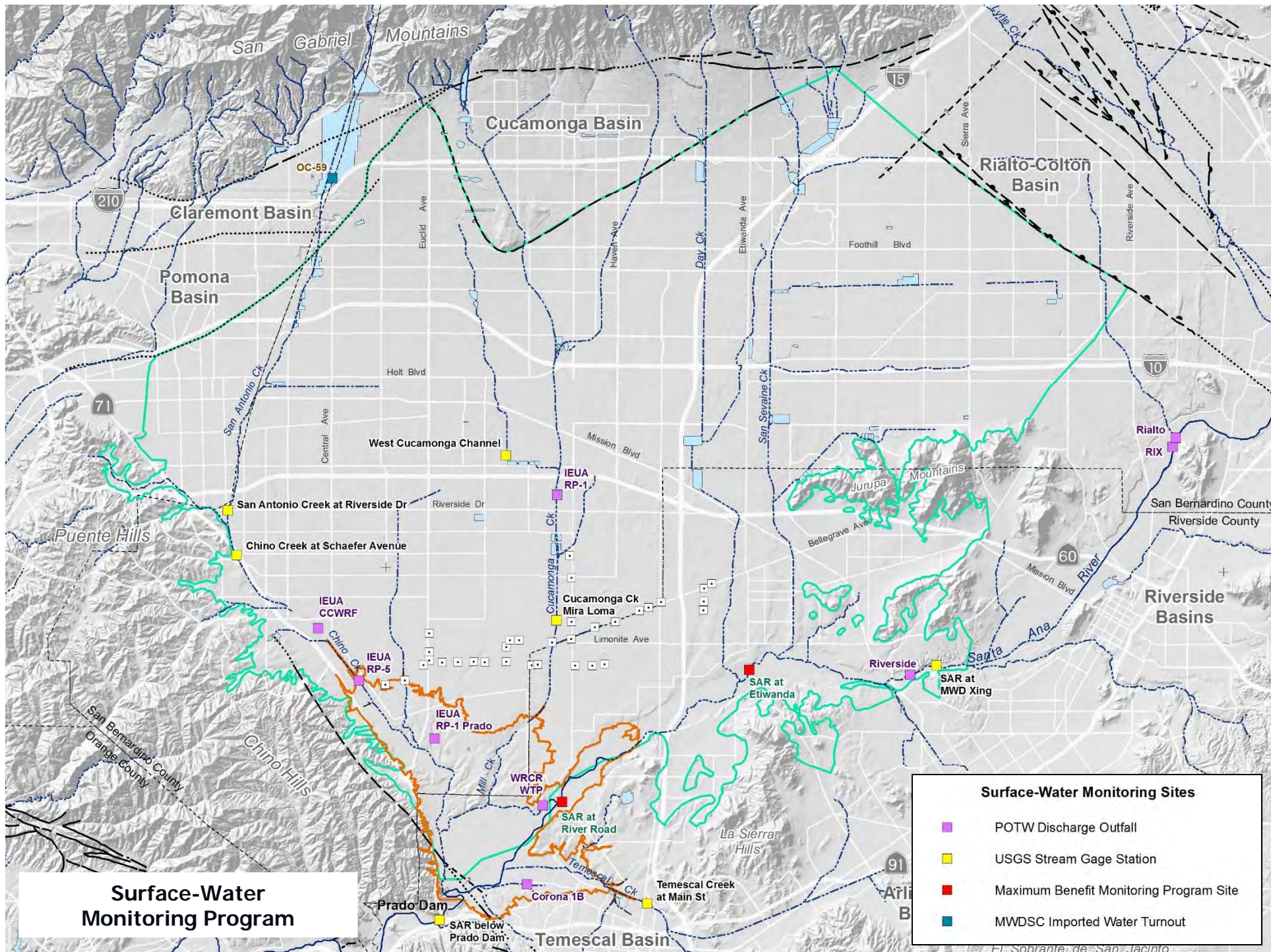
Next Steps

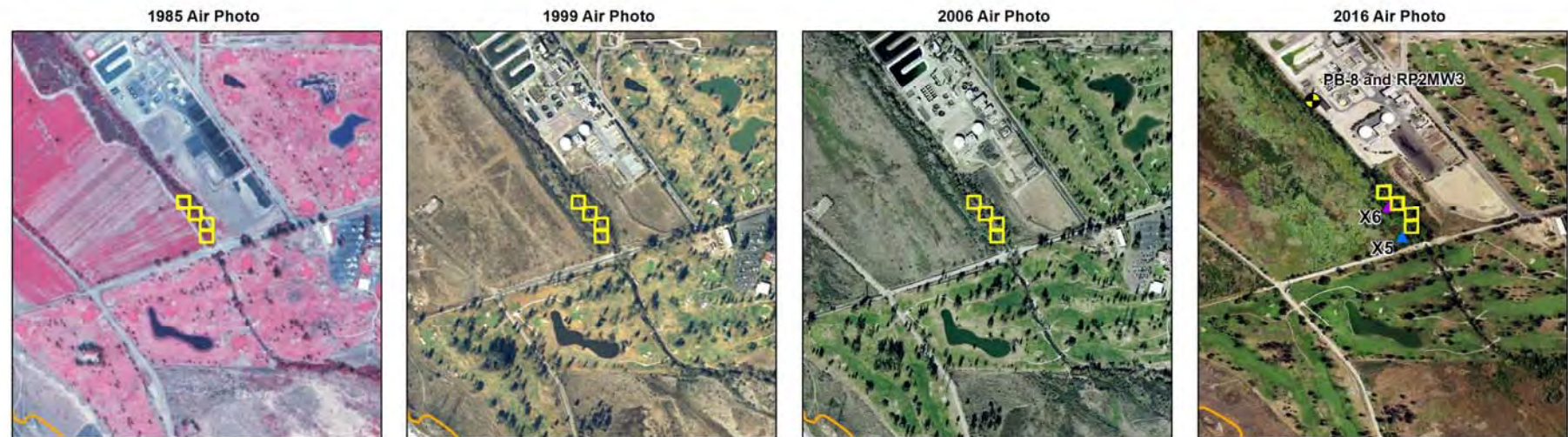
- April 28, 2017 – Finalize Recommended Scope and Budget of the PBHSP for FY 2017–18 for Watermaster/IEUA use in its' budgeting processes
- May 10, 2017 – PBHSC members submit comments and suggested revisions on the Draft 2016 Annual Report (through Section 3.1)
- May 24, 2017 – Draft 2016 Annual Report (Section 3.2 to Section 4) submitted to PBHSC for review and comment
- June 6, 2017 – PBHSC Meeting to review draft 2016 Annual Report (Sections 3.2 to Section 4)
- June 14, 2017 – PBHSC members submit comments and suggested revisions on the draft 2016 Annual Report (through Section 4)
- June 30, 2017 – Final 2016 Annual Report
- July 2017 – Annual Report in agenda packet for Watermaster/IEUA meetings



Questions ?







Map Properties:

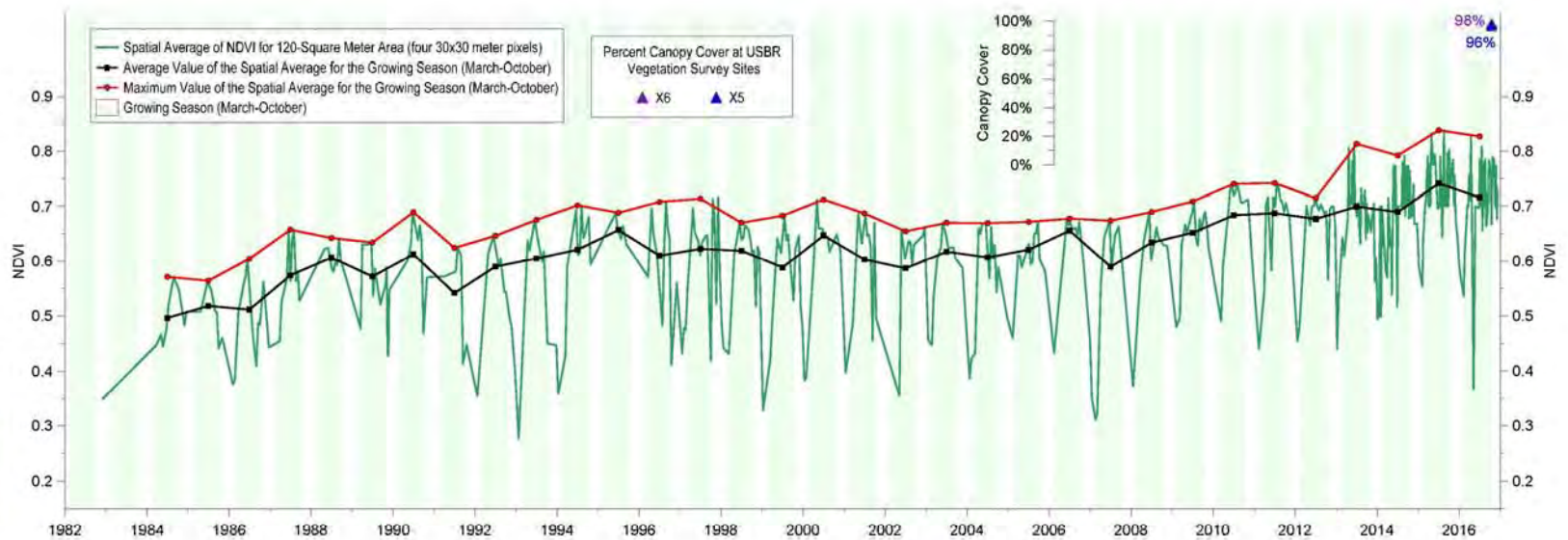
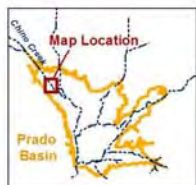
0 0.1 0.2 Miles

NDVI 30 x 30 Meter Pixel

USBR Vegetation Survey Site:

X6
X5

PBHSP Monitoring Well



Author: VMM/RT
Date: 20170314
Filename: ndvi_time_series_Chino Creek 2.grf

Prado Basin Habitat
Sustainability Committee
2016 Annual Report



Time Series of NDVI and
Air Photos at Chino Creek 2 Site
1982 to 2016

Figure 3-6