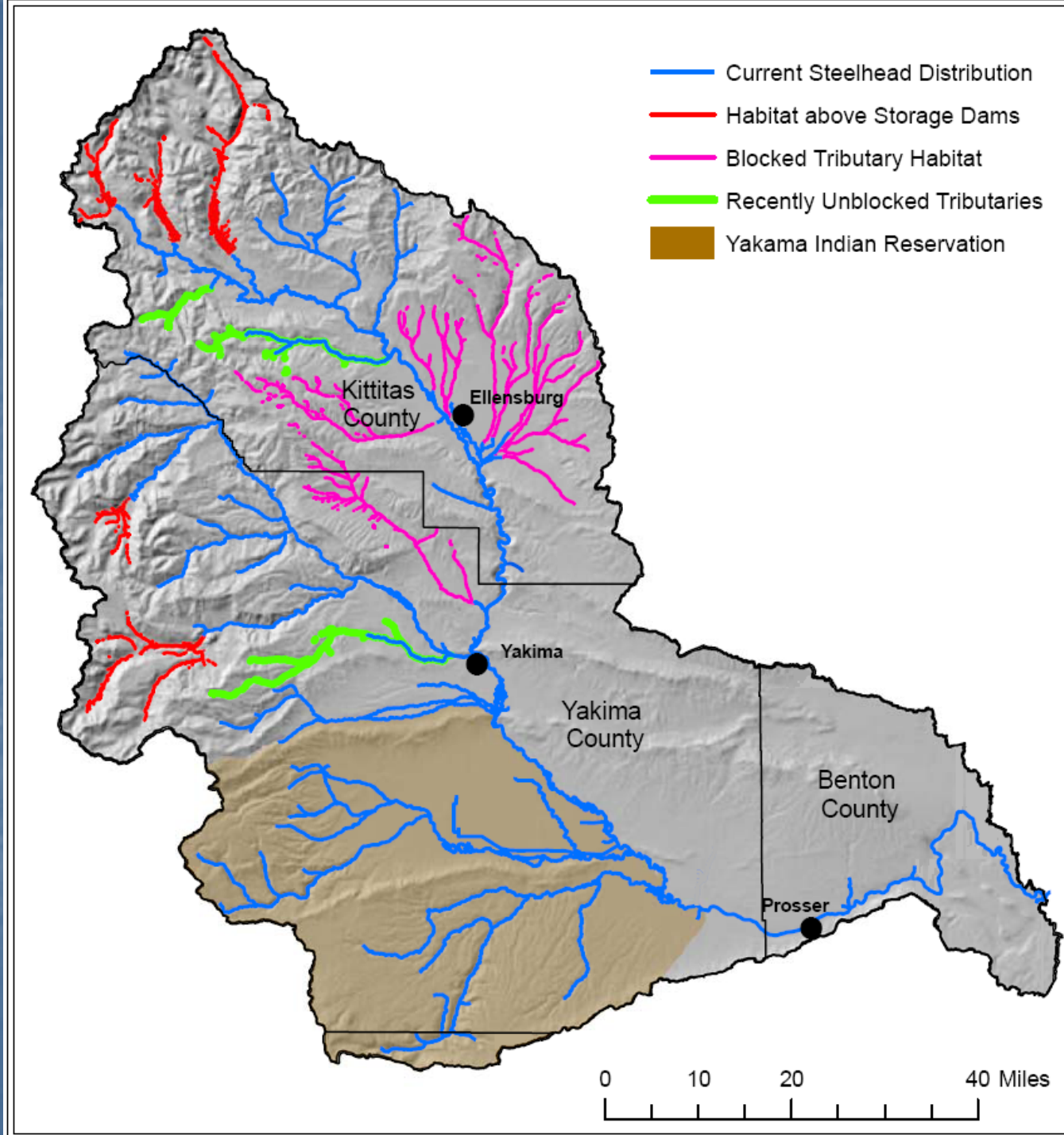






Tributary Passage & Screening



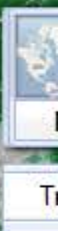
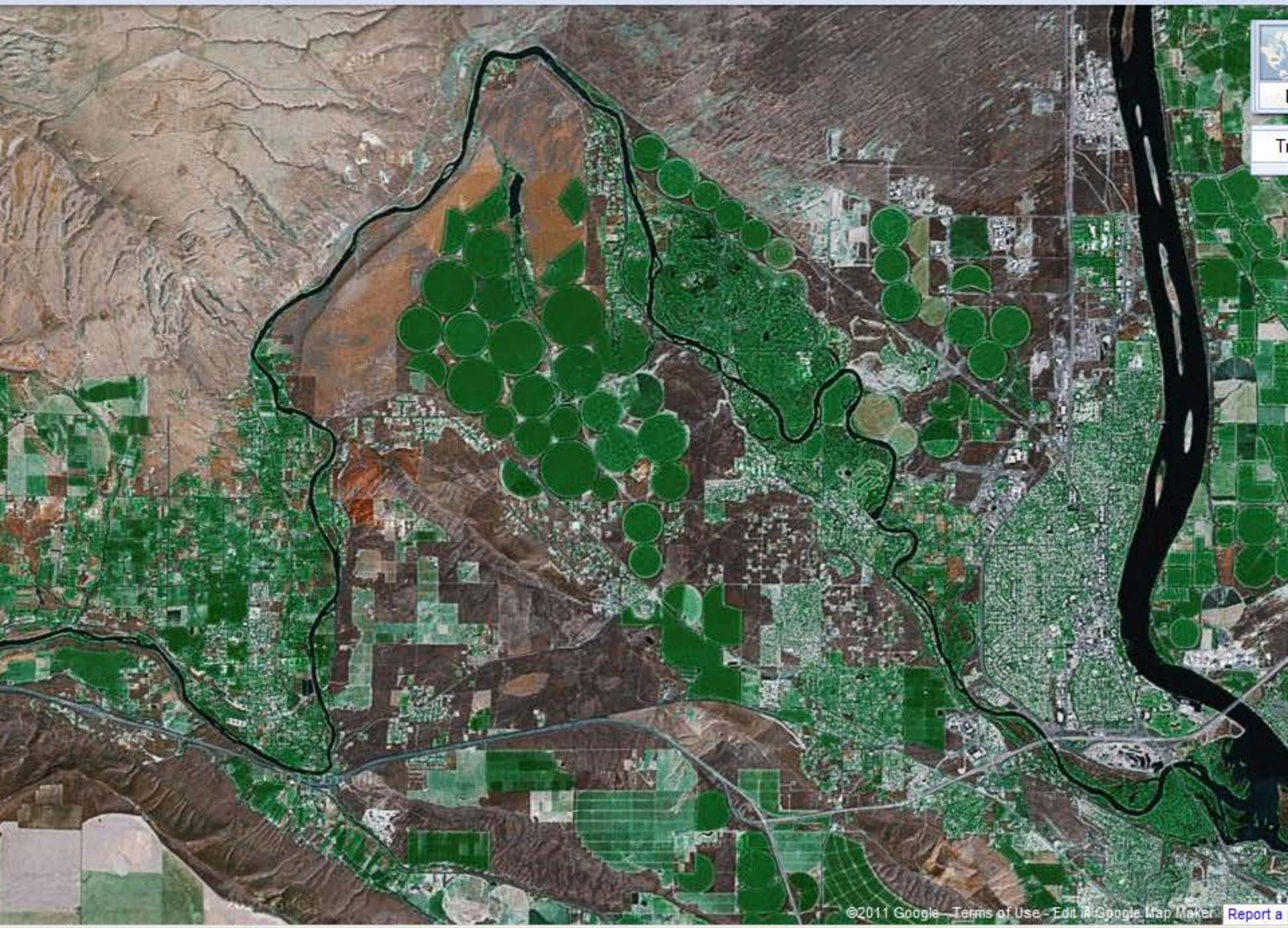




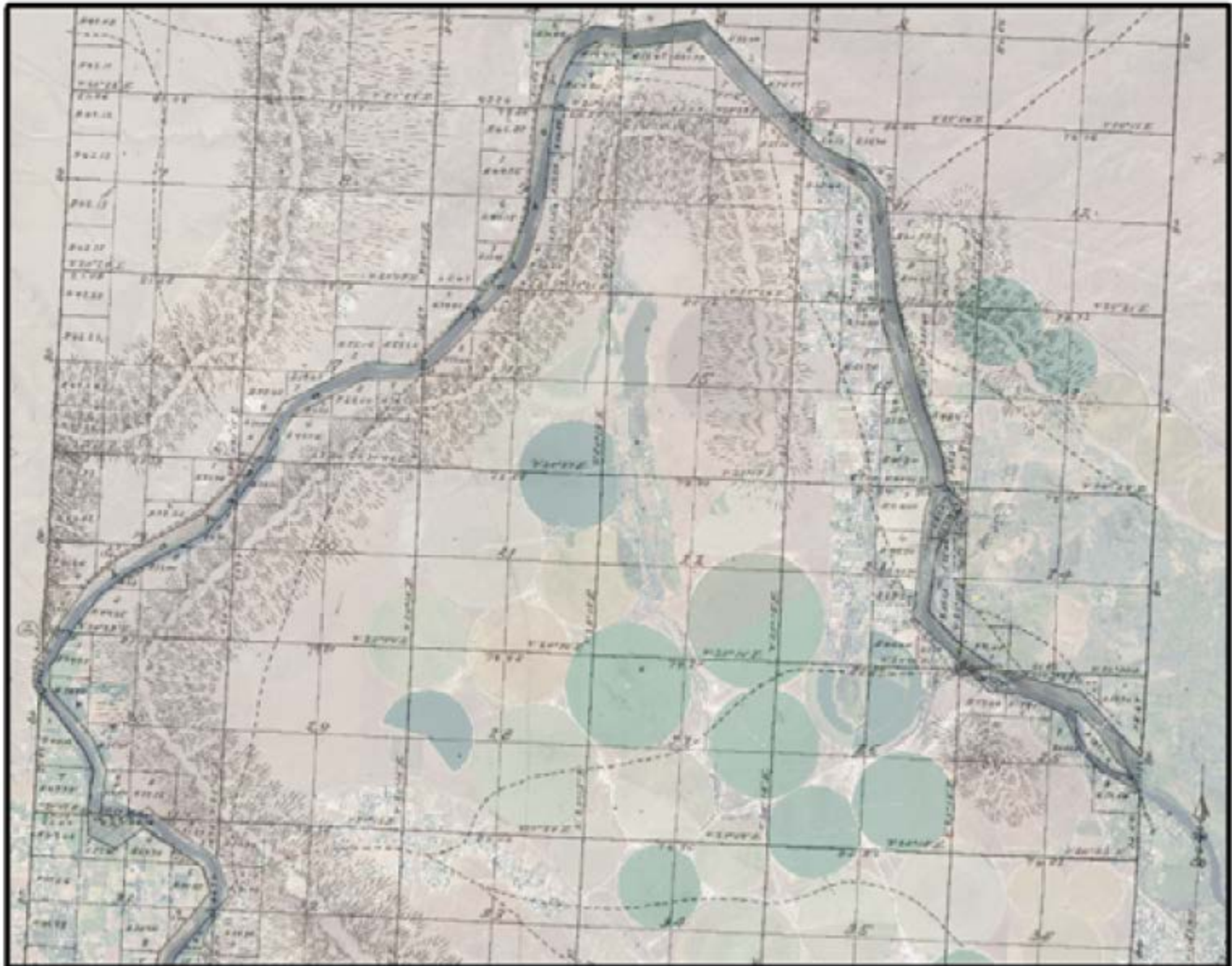


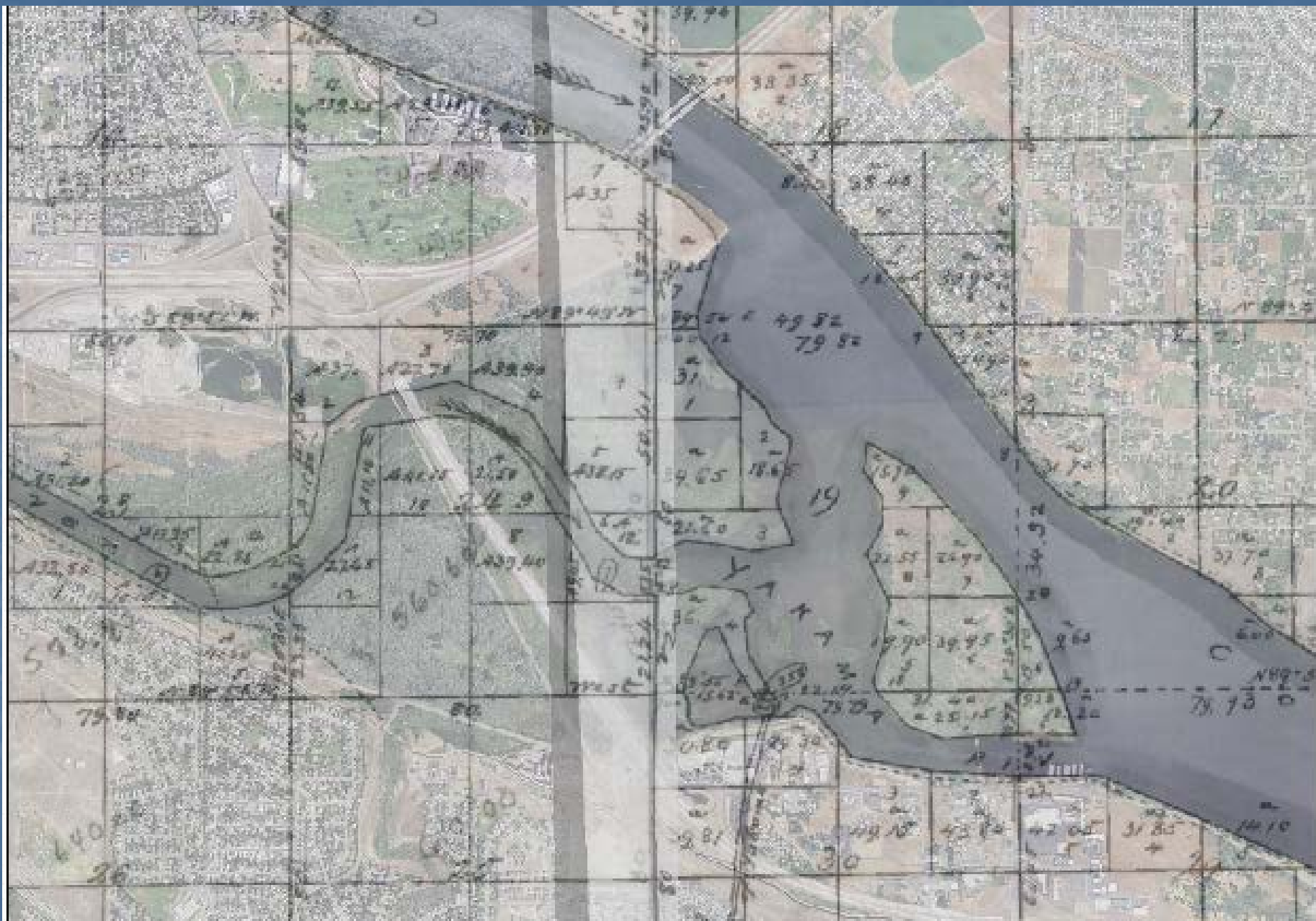






Yakima River - 1864 General Land Overlay









GLO 1864 survey notes:

Yearly, the Yakama River disgorges from its mountain sources [an] abundance of driftwood, composed of the finest quality of timber, whole trees from 20 to 70 in diam. and from 100 to 250 feet in length of fir and cedar lumber are often seen winding their way down its current, into the broad waters of the Columbia.



Figure 55. Lower Yakima River Island head with large woody debris after 2009 flood.



Figure 54. Prosser Dam with captured large woody debris (2010).

Daily discharge, in second-feet, of Yakima River near Richland, Wash., for 1909.

Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.	Day.	Aug.	Sept.	Oct.
1.....		64	375	11.....	387	38	465	21.....	133	167	562
2.....		64	387	12.....	368	64	400	22.....	96	215	562
3.....	614	64	400	13.....	337	64	465	23.....	96	268	530
4.....	614	51	400	14.....	337	59	660	24.....	96	257	595
5.....	725	64	498	15.....	279	80	595	25.....	80	279	562
6.....	465	64	562	16.....	279	64	595	26.....	64	325	562
7.....	387	59	465	17.....	225	59	595	27.....	80	337	595
8.....	387	51	465	18.....	225	80	582	28.....	133	337	595
9.....	375	51	465	19.....	133	103	582	29.....	133	350	595
10.....	356	38	498	20.....	133	96	582	30.....	133	400	595
								31.....	96	628

NOTE.—These discharges are based on a fairly well-defined rating curve.

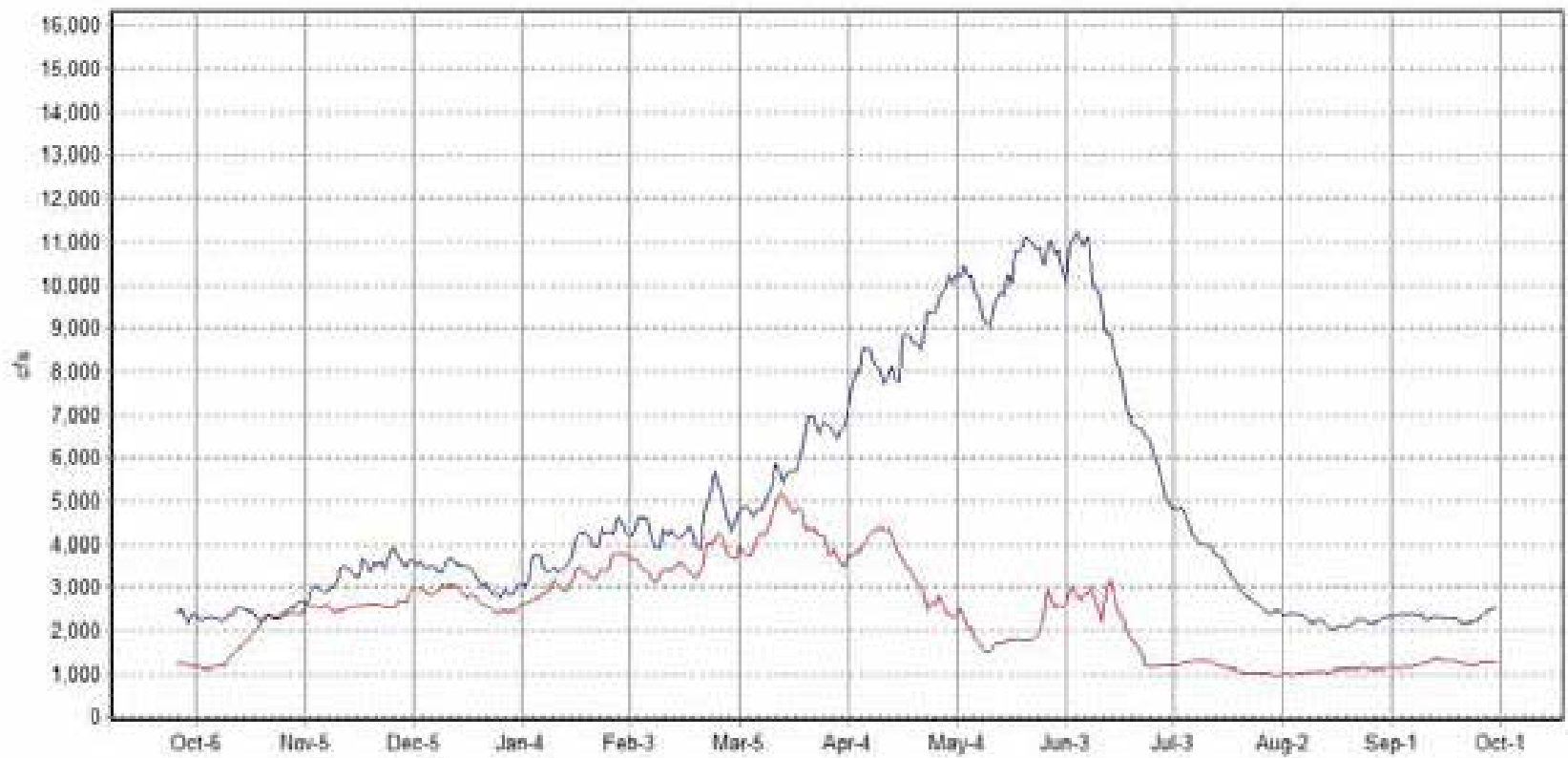




Figure 20. Return flow discharging into the Yakima River before (left) and after (right) irrigation improvements (Photos courtesy of SYCD).

Kiona Reach





Figure 3. Several salmon redds near river mile 84.5

Table 3. Distribution of fish (1957-1958).

DISTANCE FROM MOUTH OF RIVER (KM.)	0	16	32	48	64	89	105	120	137	153	169	185	201	217	233	250	266	281
	8	24	40	56	72	97	113	129	145	161	177	193	209	225	241	258	274	281
Lamprey																		
Salmon																		
Mountain whitefish																		
Cutthroat trout																		
Rainbow trout																		
Brown trout																		
Brook trout																		
Dolly varden																		
Chiselmouth																		
Corp																		
Peomouth																		
Northern squawfish																		
Longnose dace																		
Leopard dace																		
Speckled dace																		
Redside shiner																		
Chiselmouth X northern squawfish																		
Redside shiner X speckled dace																		
Bridgellip sucker																		
Largescale sucker																		
Mountain sucker																		
Largescale sucker X bridgellip sucker																		
Black bullhead																		
Sand roller																		
Bluegill																		
Smallmouth bass																		
Largemouth bass																		
Black crappie																		
Yellow perch																		
Prickly sculpin																		
Mottled sculpin																		
Plute sculpin																		
Torrent sculpin																		
Number of species per site ^U	16	15	14	17	13	13	16	13	17	18	20	15	15	19	13	17	14	13
	16	17	14	16	11	13	16	14	19	20	15	15	18	15	15	15	13	13



worleybugger-lower yakima-august 2006

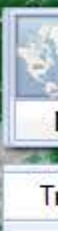
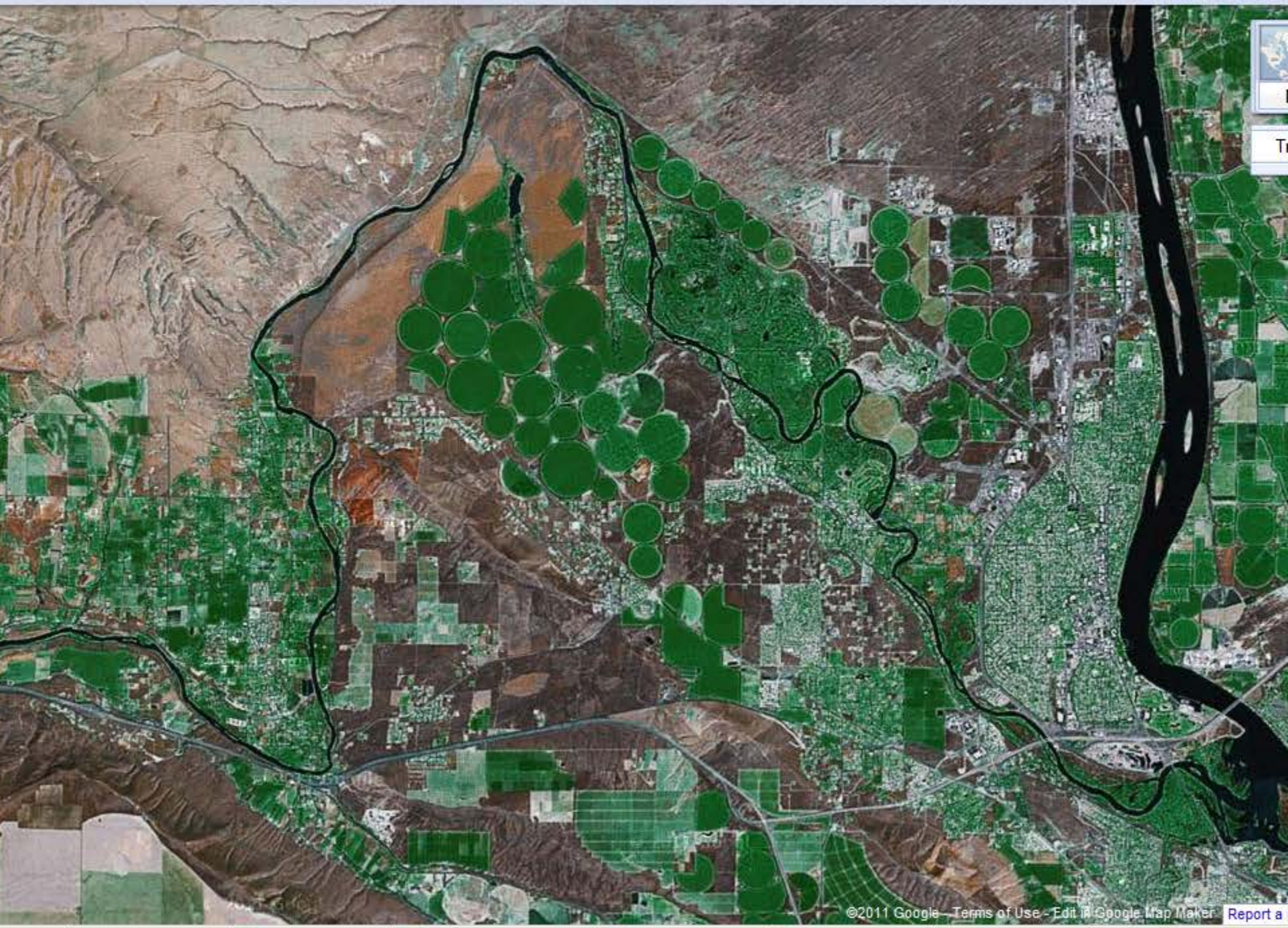




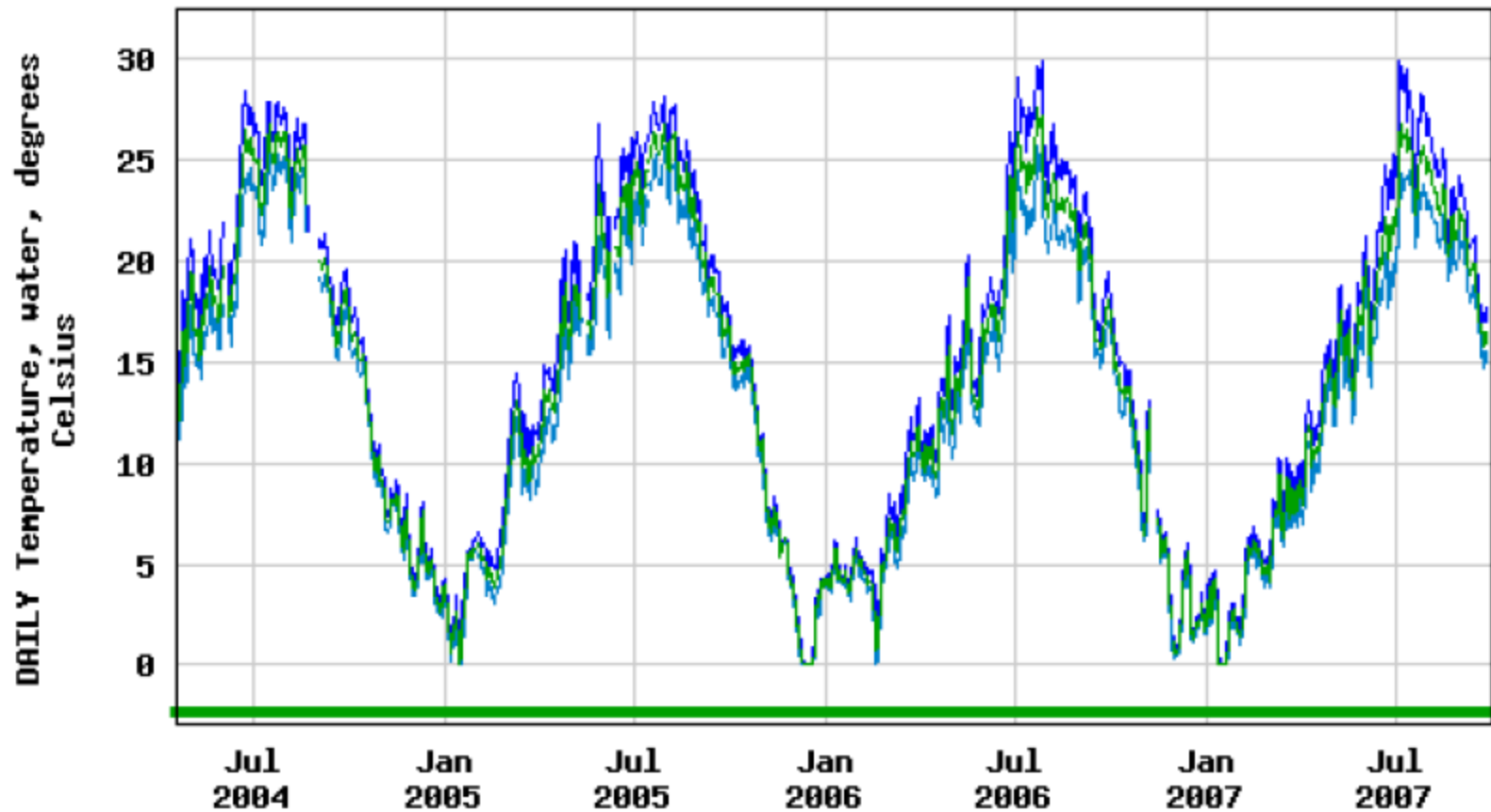


Figure 13. Dry side channel, West Richland.

Thanks to Tom Seim...

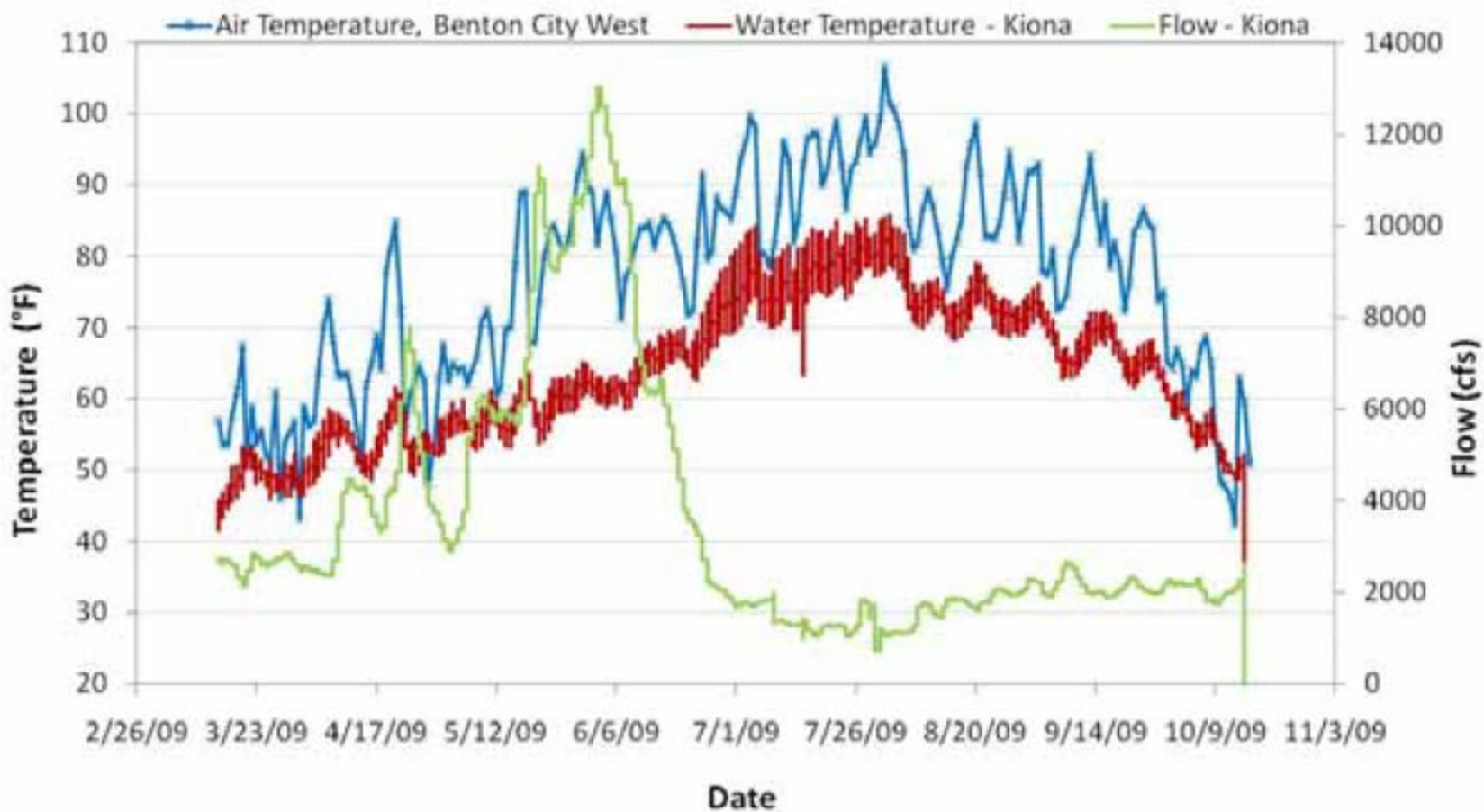


USGS 12510500 YAKIMA RIVER AT KIONA, WA



— Daily maximum temperature — Daily mean temperature
— Daily minimum temperature — Period of approved data

Lower Yakima River Data March 15, 2009 - October 15, 2009



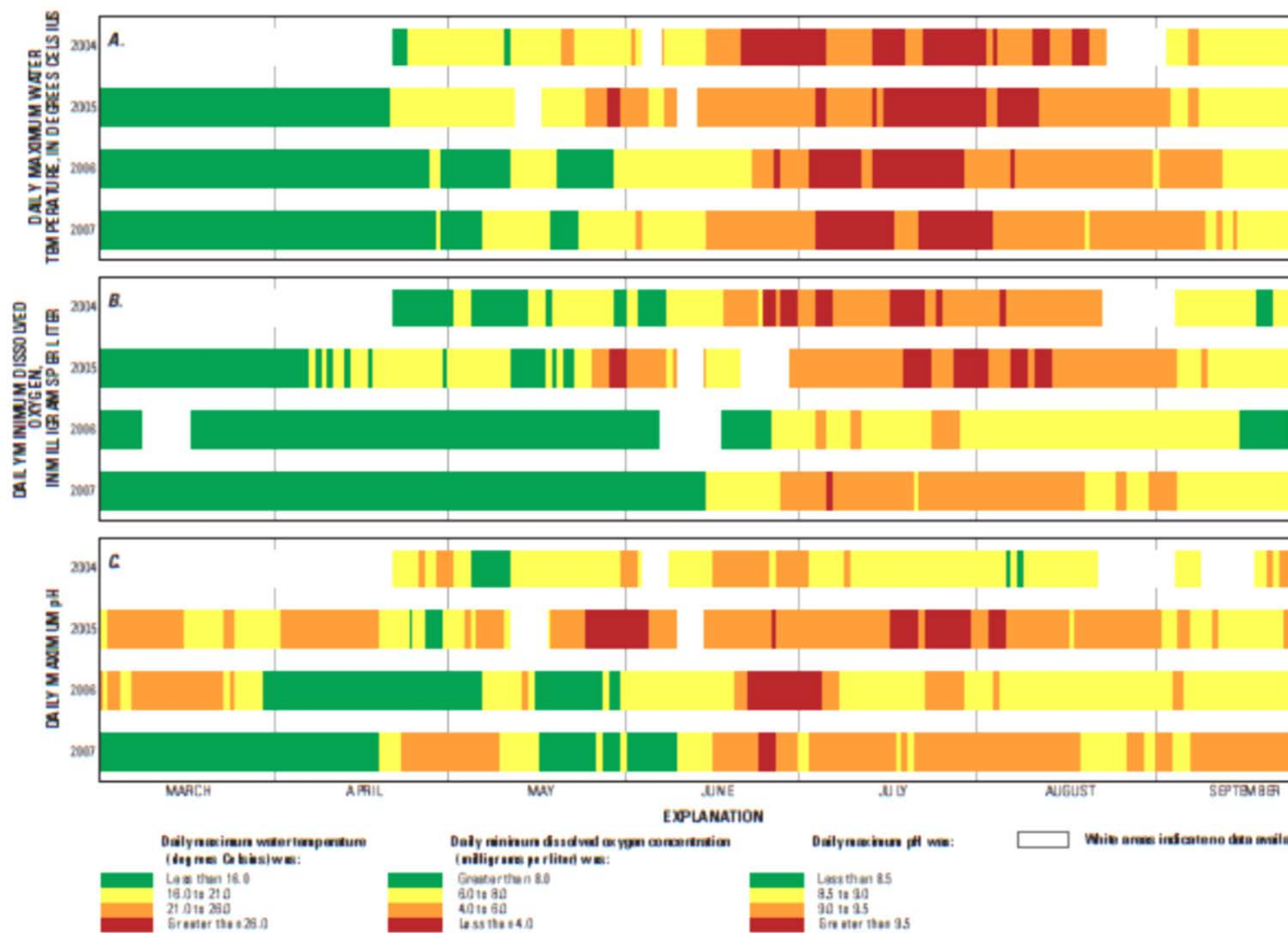


Figure 11. Comparison of water quality conditions for 4 of 5 years (2004-2007) at the site. The color coding is the same as in Figure 10.

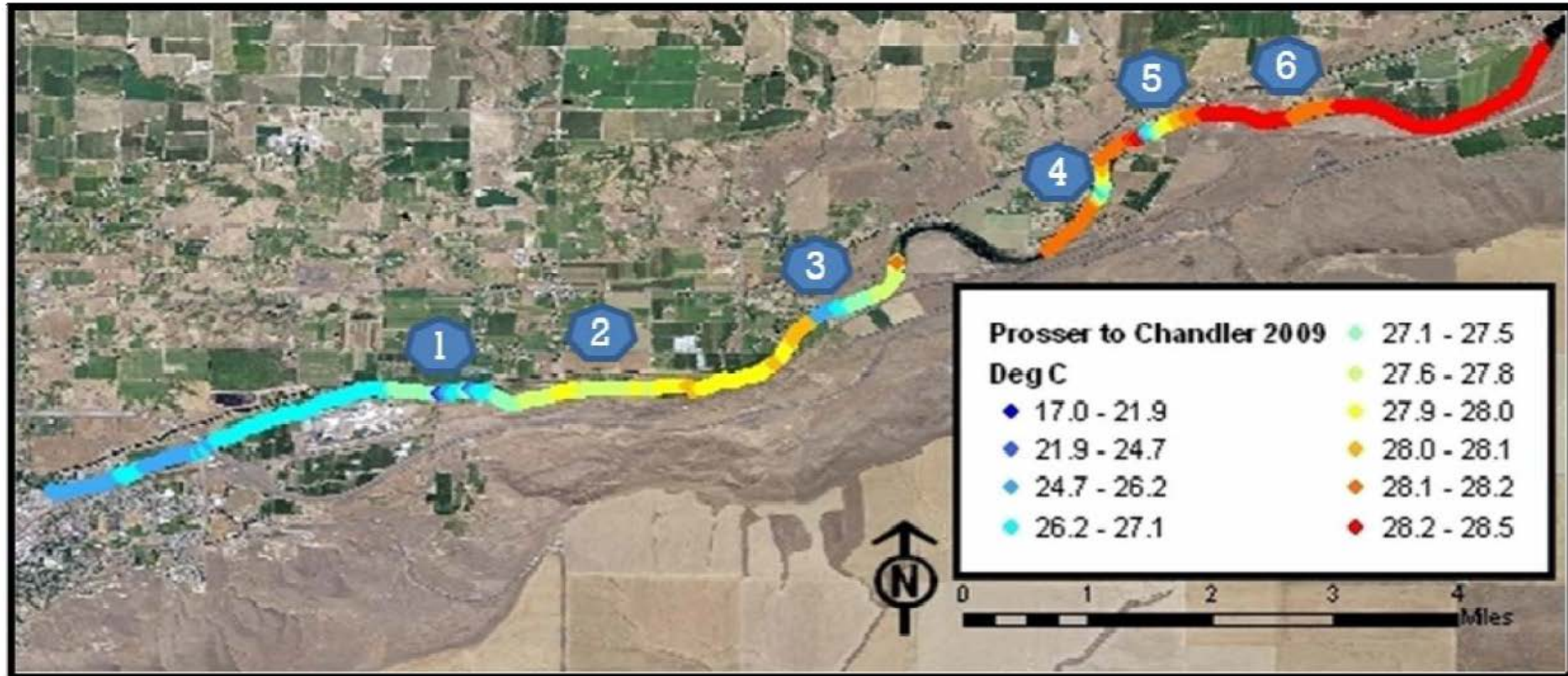


Figure 32. 2009 Thermal Map, Prosser to Chandler. Numbers indicate areas of cooling.

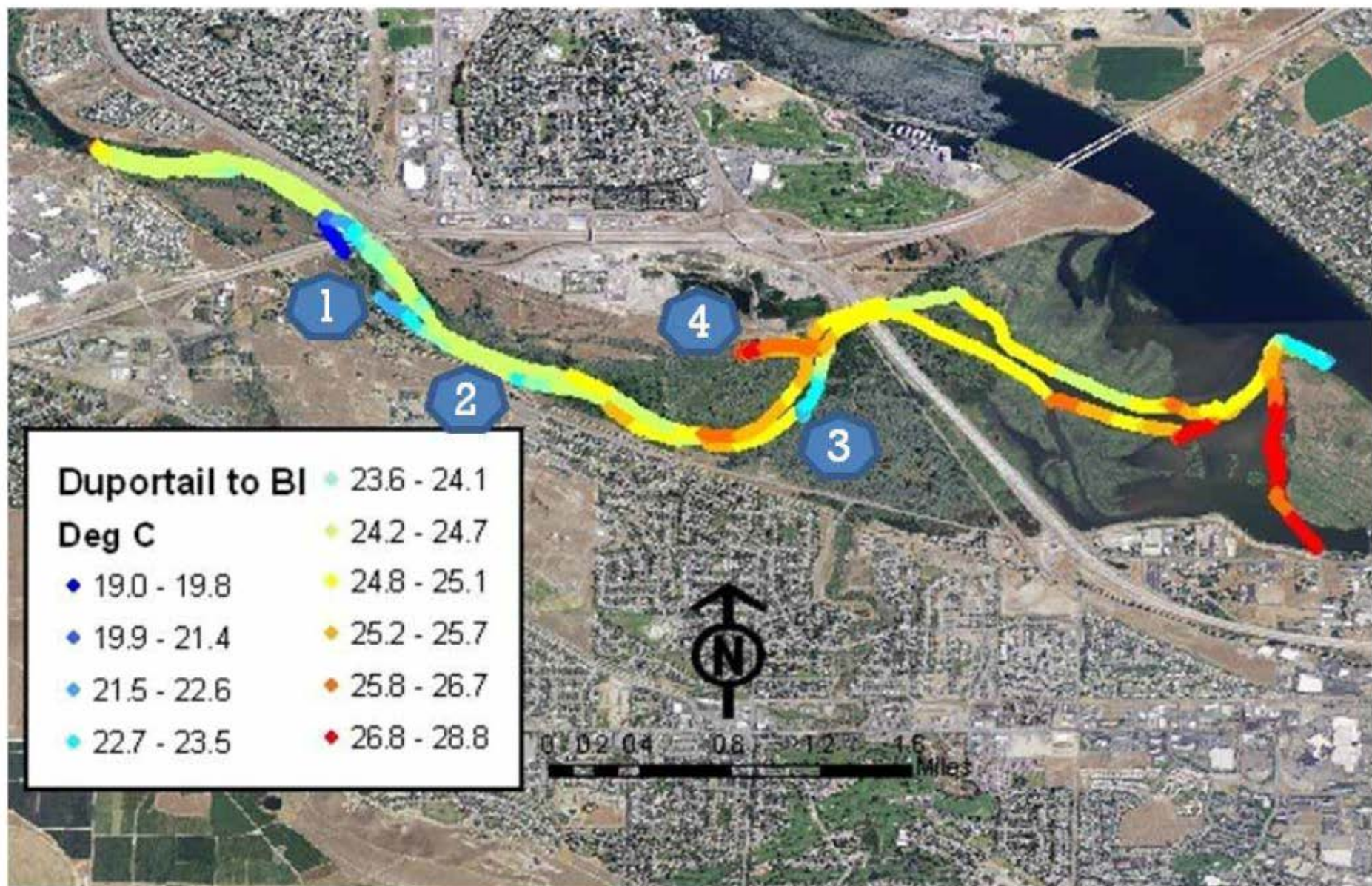


Figure 50. 2008 Thermal Map of Yakima River Confluence

Duportail Boat Launch to Bateman Island

08/14/08

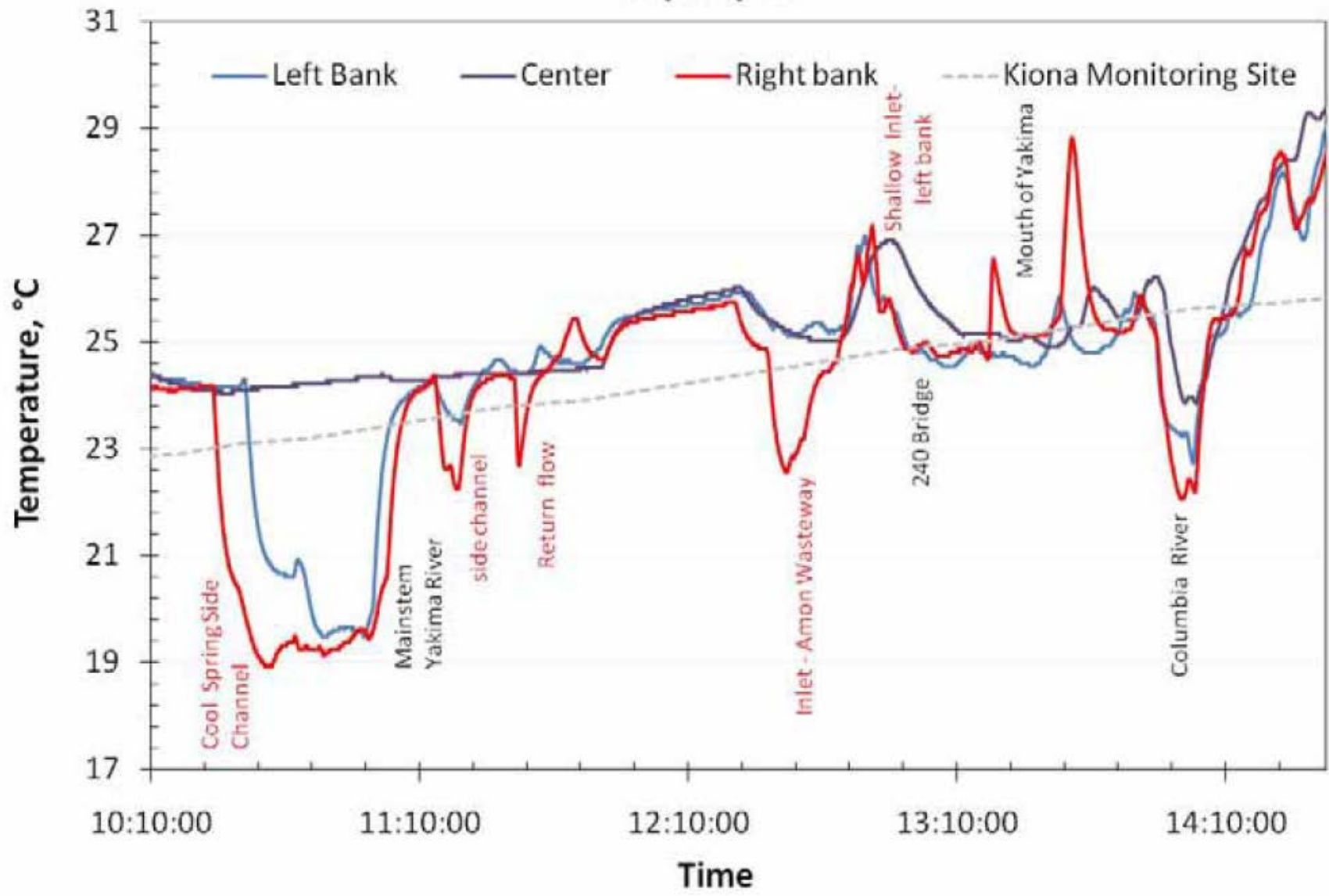


Figure 47. 2008 Thermal Profile Data for Richland, WA (Duportail Boat Launch to Bateman Island).

Different Life Histories, Different Issues...

- Fall Chinook spawning in reach
Gravel availability, predation...
- Summer migrants
(summer Chinook, sockeye)
Temperature & perhaps DO
- Spring out-migrants (March thru May)
Predation as primary limit; temp secondary
- Late out-migrants
(fall & summer Chinook, some coho)
Diversion impacts, temps, DO, predation....

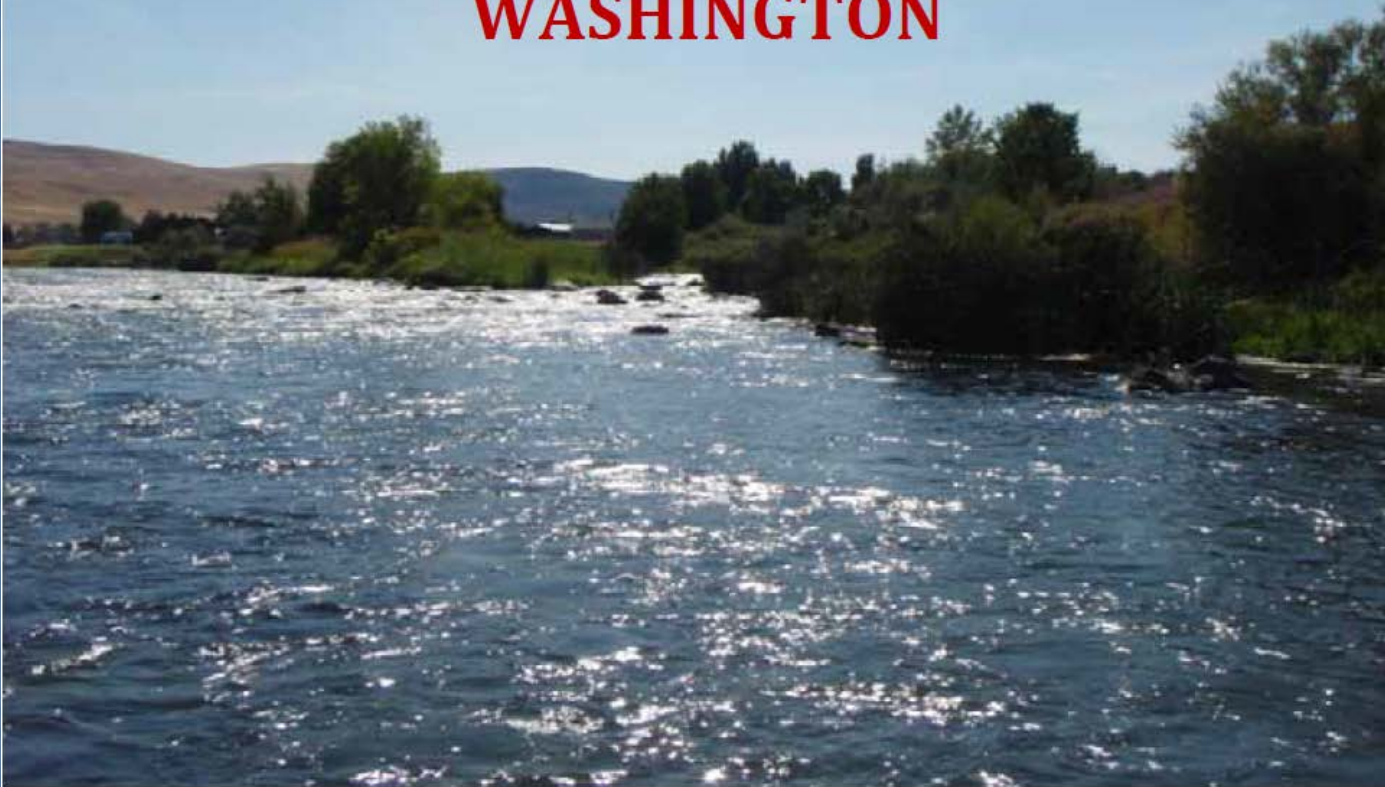
Recommendations

- Continue screening and riparian projects
- Continue water quality improvements
- Protect & enhance temperature refugia
- Protect remaining floodplains
- Reduce diversion-related mortalities

Explorations

- Solutions to Water Stargrass?
- Impacts of irrigation changes on refugia?
- Use LWD to scour pools and side channels?
- Manage flows around times of temperature change?
- Reconfigure the Yakima Delta?

ASSESSMENT OF THE LOWER YAKIMA RIVER IN BENTON COUNTY, WASHINGTON



*Prepared by:
The Benton Conservation District*

Salmon Recovery Funding Board Grant #07-1566
February 15, 2011



Yakima River Delta Habitat Assessment



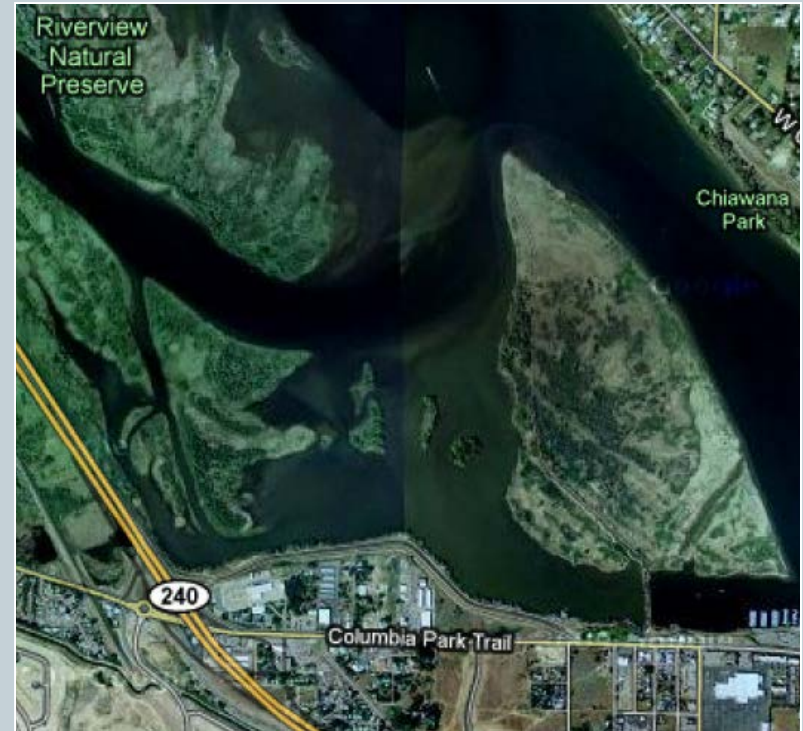
SRFB GRANT #10-1784

**MID-COLUMBIA FISHERIES
ENHANCEMENT GROUP
AND
BENTON CONSERVATION DISTRICT**

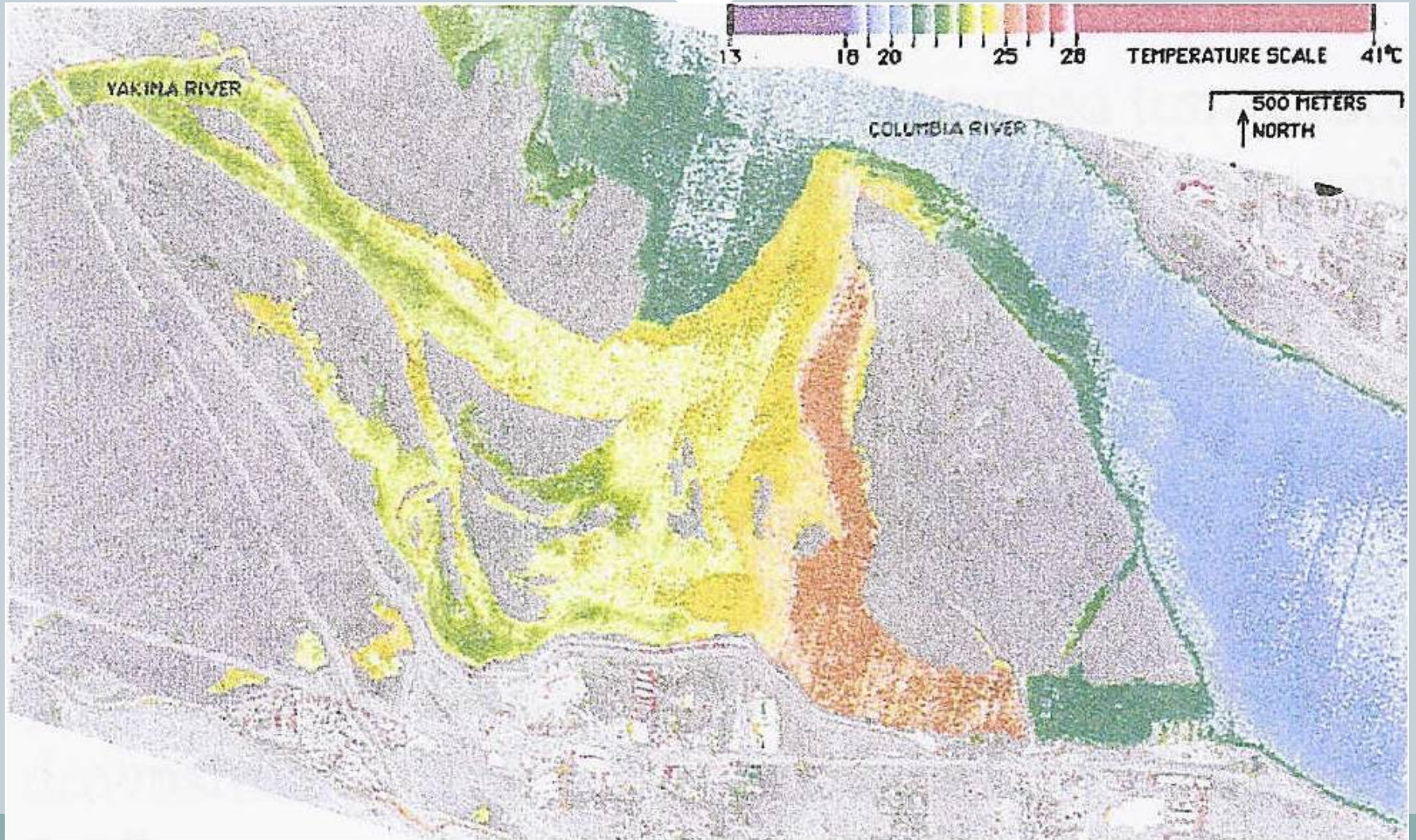
Project overview



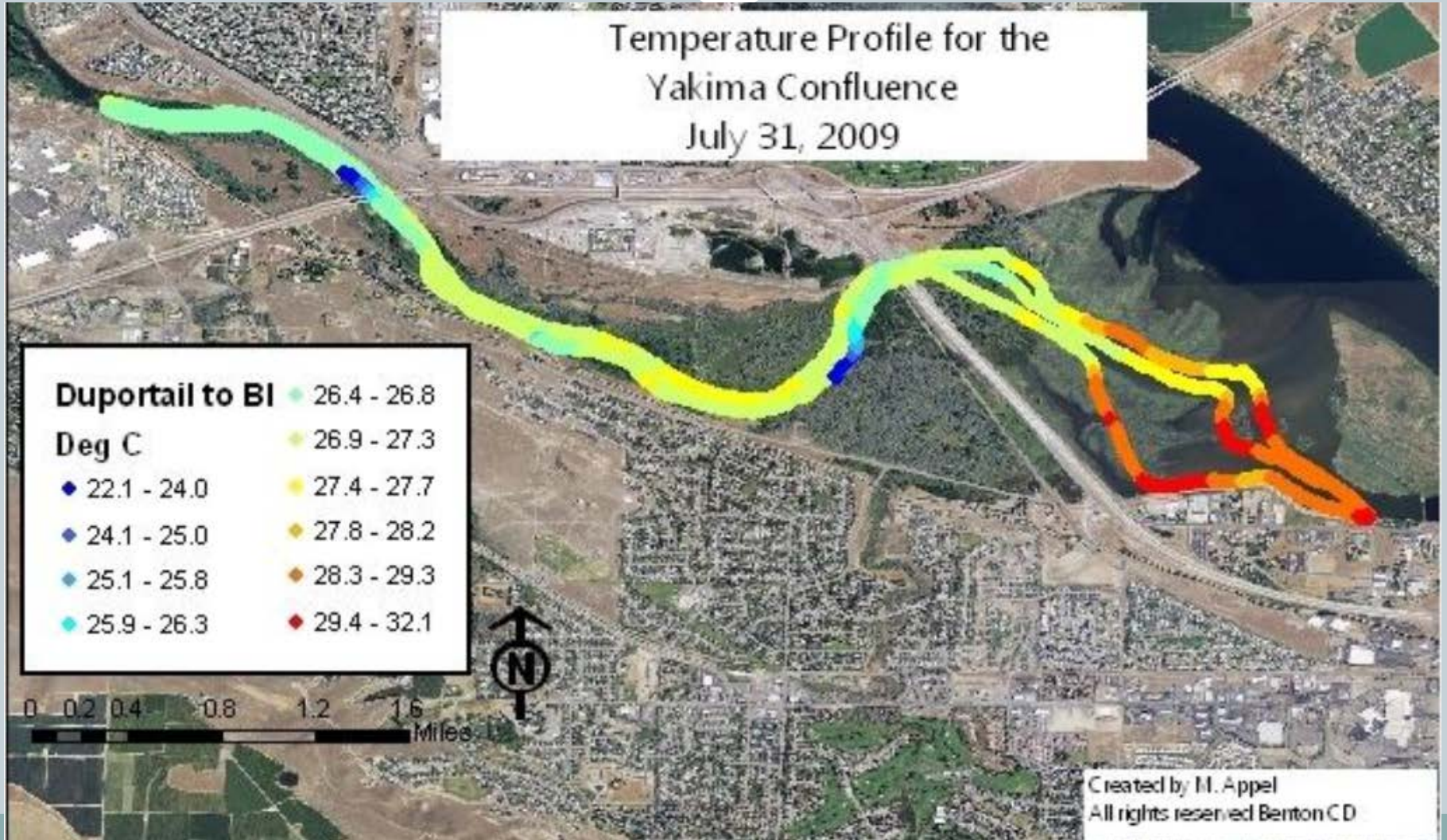
- **Assessment of habitat and non-habitat factors at the confluence of the Yakima and Columbia Rivers**
 - Temperature interactions
 - Sediment and hydrology
 - Fish movement and predation dynamics
 - Political and social feasibility of modifications



1997 Aerial Thermography Data



Benton CD Monitoring Data



Data gaps



- **What are the current salmonid dynamics at the confluence?**
- **What are the flow dynamics, water quality and sedimentation rates at the confluence?**
- **How does the causeway impact salmon, flow, water quality and sedimentation?**
- **What is the feasibility of causeway modification in terms of public and government support?**

Alignment with recovery plan



- **Addresses uncertainty in how mainstem conditions impact smolt survival (7.2.3, p. 219)**
- **Potential to address two limiting factors**
 - lower mainstem water temperature and
 - lower mainstem water quality (p. 107)

Timeline



March, 2011	Meetings of Lower Yakima River TAG to review modeling proposals; Yakama Nation begins salmonid sampling
April, 2011	INTERA selected to build physical parameter model
June, 2011 – November, 2012	Data collection
December, 2012	Report of model results
February, 2013 – March, 2013	Public meeting, completion of project report

Sampling of fish distribution & abundance



Installing Bathymetric Sampling Equipment



Sample of Bathymetric data

