

**Pend Oreille River TMDL
Watershed Advisory Group:
Development of Tributary, Mainstem,
and NPDES Allocations**



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October 25, 2007



Pend Oreille River Temperature TMDL: Development of Allocations



- Allocations for sources other than dams
 - Tributary water temperatures
 - Allocations based on percent effective shade
 - Mainstem riparian shade
 - Allocations based on percent canopy and average tree height
 - NPDES-permitted point sources
 - Allocations based on seasonal heat load



Pend Oreille River Temperature TMDL: Development of Allocations



- Tributary water temperatures and shade
 - Follows procedures used in Colville National Forest TMDL
 - Uses rTemp temperature response model
 - Time series of weather conditions
 - Ground water inflow and temperature
 - Water depth
 - Percent shade
 - EPA conducted shade analysis from USFS shade coverage (GIS)



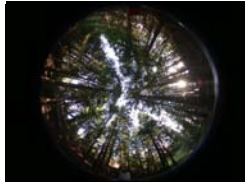
Pend Oreille River Temperature TMDL: Development of Allocations



- Tributaries and applicable standards
 - Cee Cee Ah and Calispell Creek
 - Shared waters of Washington and Kalispel Tribe

Criteria for Shared Tributaries				
Creek	Mar 1-Oct 1		Oct 2 - Feb 29	
	7DAvg Max	1D Max	7DAvg Max	1D Max
Calispell blw Smalle				
KT	18.0	20.5	18.0	20.5
WA	17.5		17.5	
Cee Cee Ah				
KT	18.0	20.5	9.0	13.0
WA	17.5		17.5	

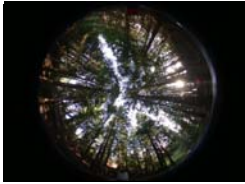
- Other creeks are waters of Washington



Pend Oreille River Temperature TMDL: Development of Allocations



Summary of Significant Tributaries				Maximum Observed		2004 303d list	USFS TMDL?	Monitoring Site (DS)
Creek Name	Reservoir	WQS Use Designation	Temperature Criterion	Temperature (deg C)				
Indian	Box Cyn	char	12.0	14.1	1		Kalispel	
Skookum	Box Cyn	spawn/rear	17.5	15.6	1		Kalispel	
Skookum		spawn/rear	17.5					
NFSkookum		spawn/rear	17.5					
Calispell blw Smalle	Box Cyn	Shared waters	varies	30.3	5	part	Kalispel	
Cee Cee Ah	Box Cyn	Shared waters	varies	18.5	1	part	Kalispel	
Tacoma	Box Cyn	spawn/rear	17.5	17.7	4A	yes	USFS/Kalispel	
Cusick	Box Cyn	spawn/rear	17.5		4A	yes	USFS	
Mill	Box Cyn	core summer	16.0	22.6	1		Kalispel/POCD	
Middle	Box Cyn	spawn/rear	17.5	15.9	(1)		Kalispel	
Leclerc	Box Cyn	core summer	16.0	18.9	1	part	Kalispel/POCD	
E.B. Leclerc		char	12.0		5 (2)	part	Kalispel	
Ruby	Box Cyn	spawn/rear	17.5	20.7	5	yes	USFS	
SF Lost	Box Cyn	spawn/rear	17.5	17.6	2	yes	USFS/Kalispel/POCD	
Lost	Box Cyn	spawn/rear	17.5	21.9	5	part	Kalispel/POCD	
Big Muddy	Box Cyn	spawn/rear	17.5	18.1	1	yes	USFS/POCD	
Little Muddy	Box Cyn	spawn/rear	17.5	19.0	5	part	Kalispel	
Cedar	Box Cyn	core summer	16.0	20.7	5	part	USFS/POCD	
Sullivan	Boundary	spawn/rear	17.5	19.1	4A	yes	USFS/ECY/SCL	
Slate	Boundary	char	12.0	15.4	1	yes	USFS/POCD	
Lime	Boundary	spawn/rear	17.5		4A	yes	USFS	
Flume	Boundary	spawn/rear	17.5	14.4	1	yes	USFS/POCD	

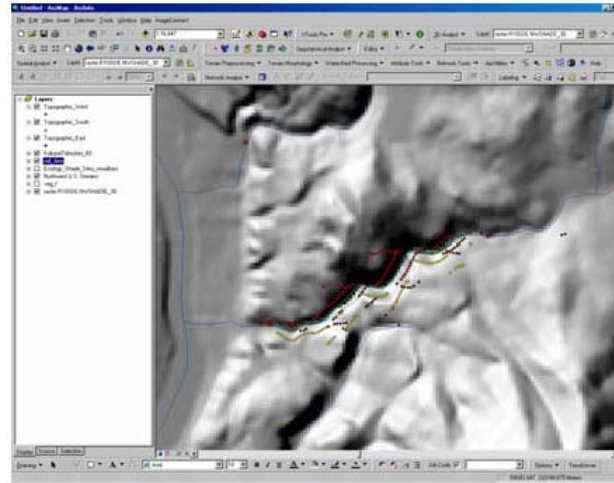
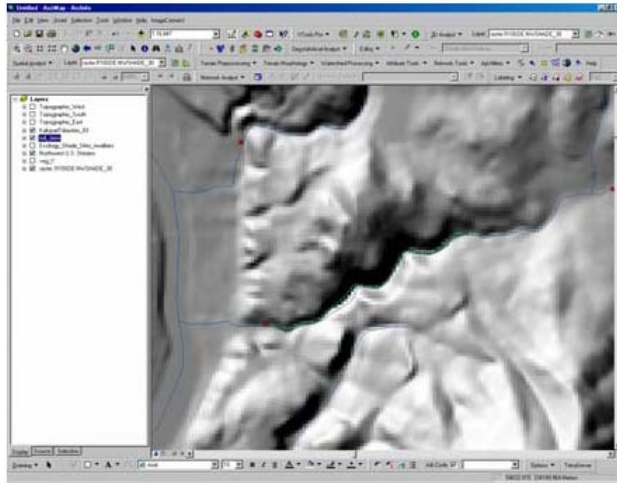


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Sampling Locations (30 meters)

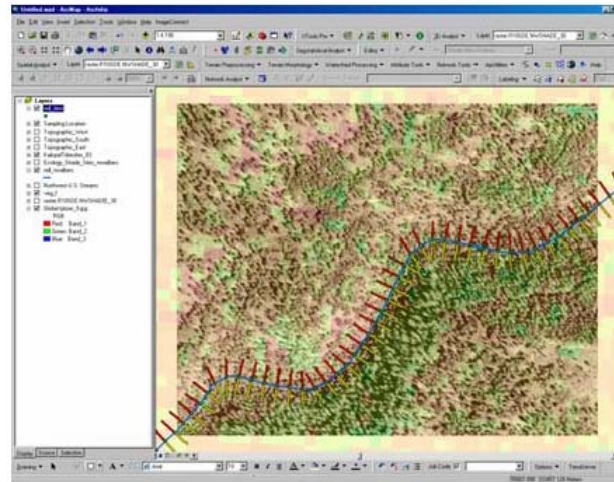
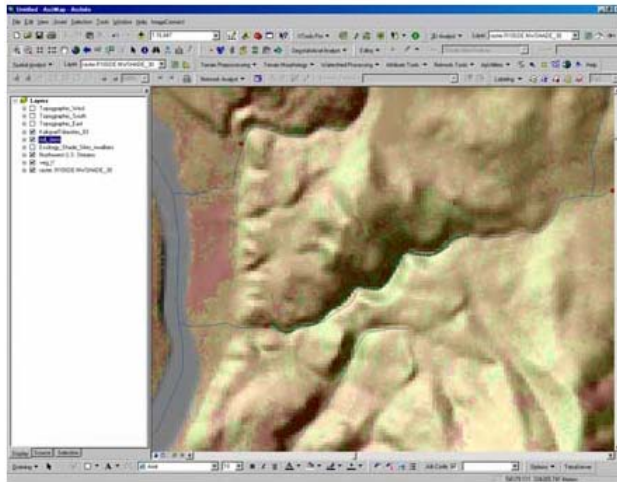
Topographic Shade Locations

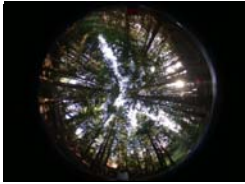


Vegetation Height and Canopy Cover Grid

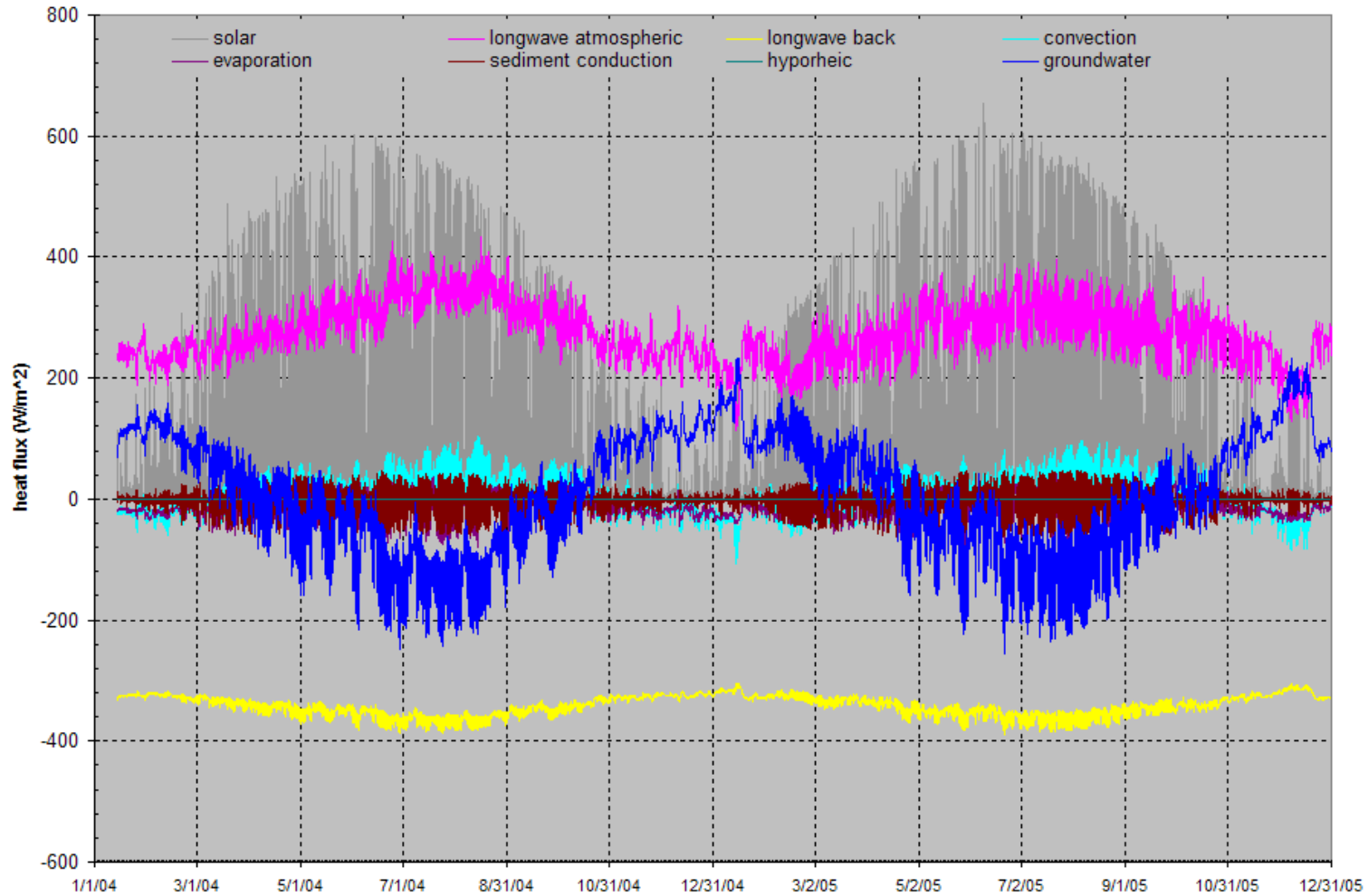
Left and Right Bank Sampling Locations

Analysis of
Existing
Tributary
Shade

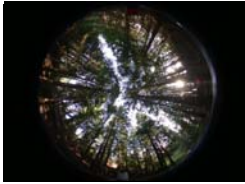




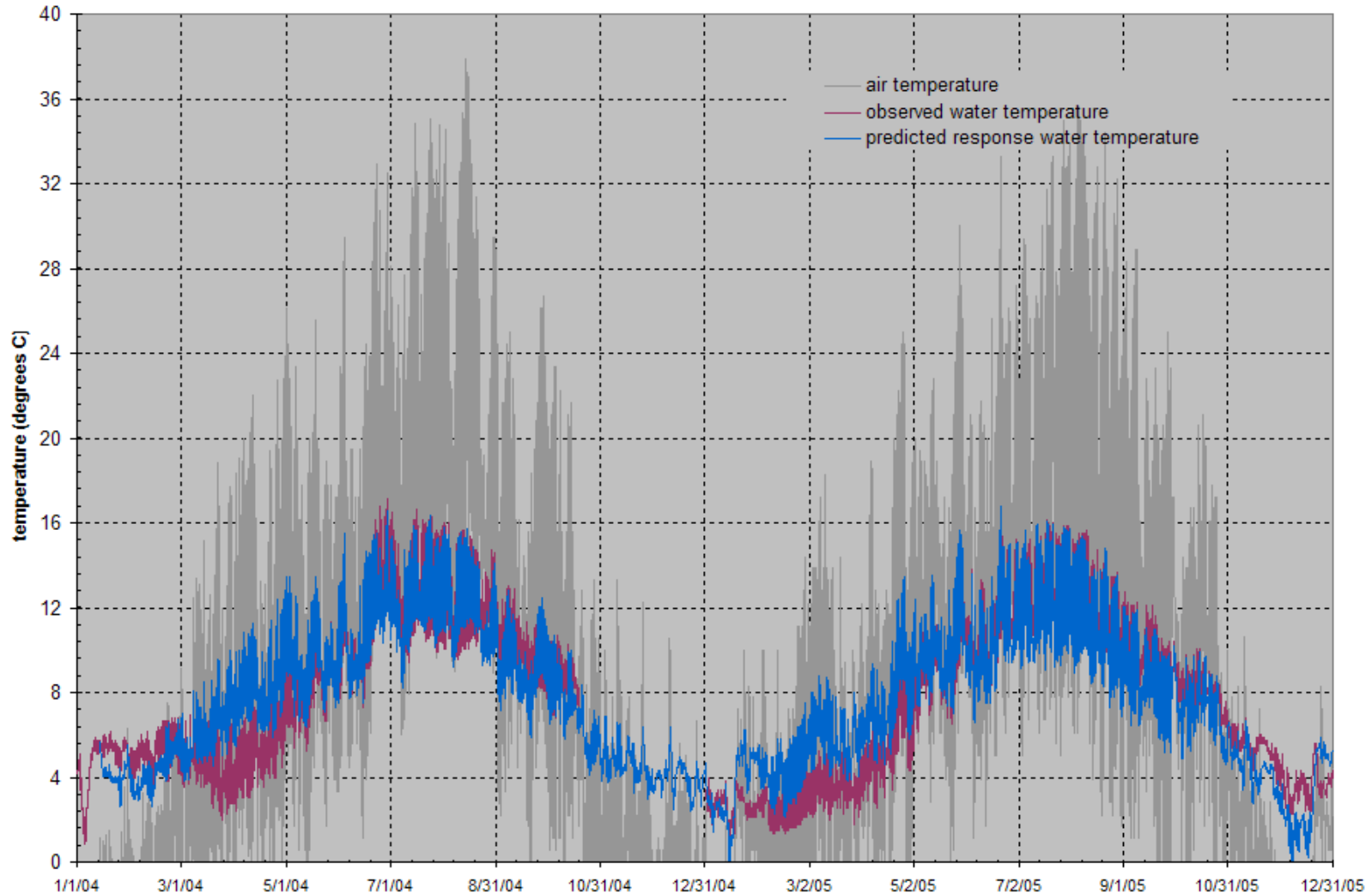
Pend Oreille River Temperature TMDL: Development of Allocations



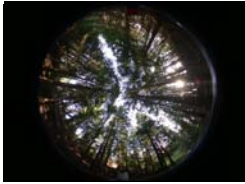
Energy Exchange in rTemp Model



Pend Oreille River Temperature TMDL: Development of Allocations



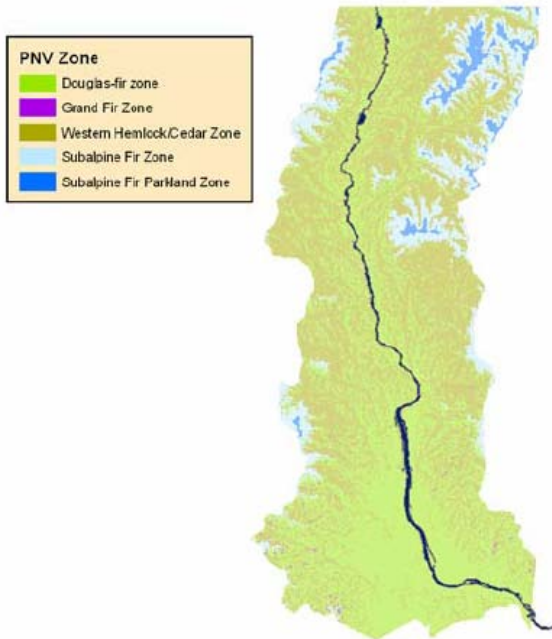
Existing Conditions Water Temperatures



Pend Oreille River Temperature TMDL: Development of Allocations



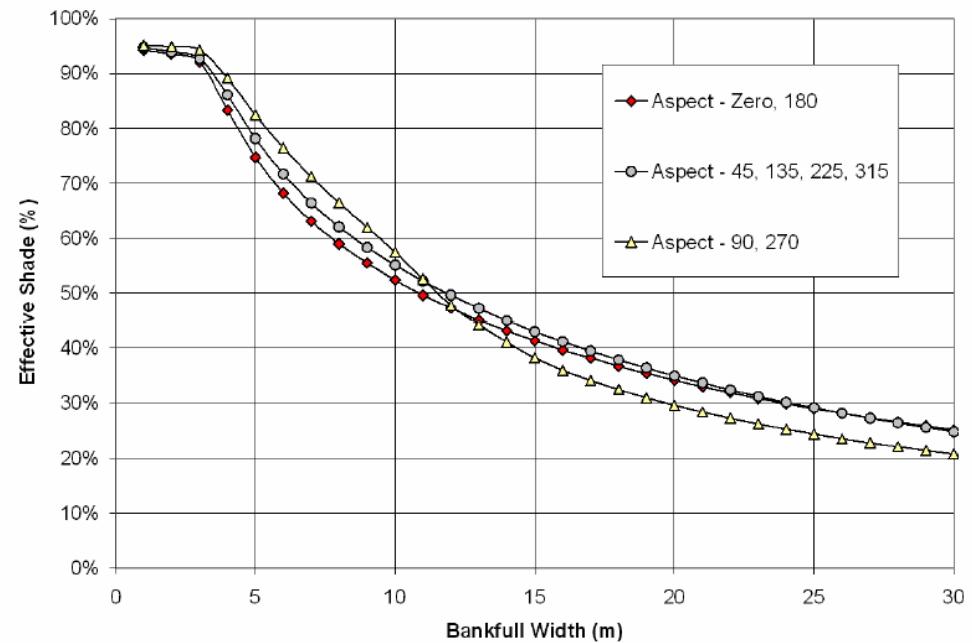
Potential Natural Vegetation Zones in the Pend Oreille Basin.

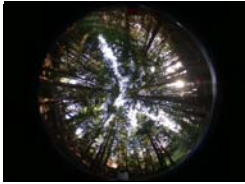


Analysis of
Potential
Natural
Vegetation
and Shade

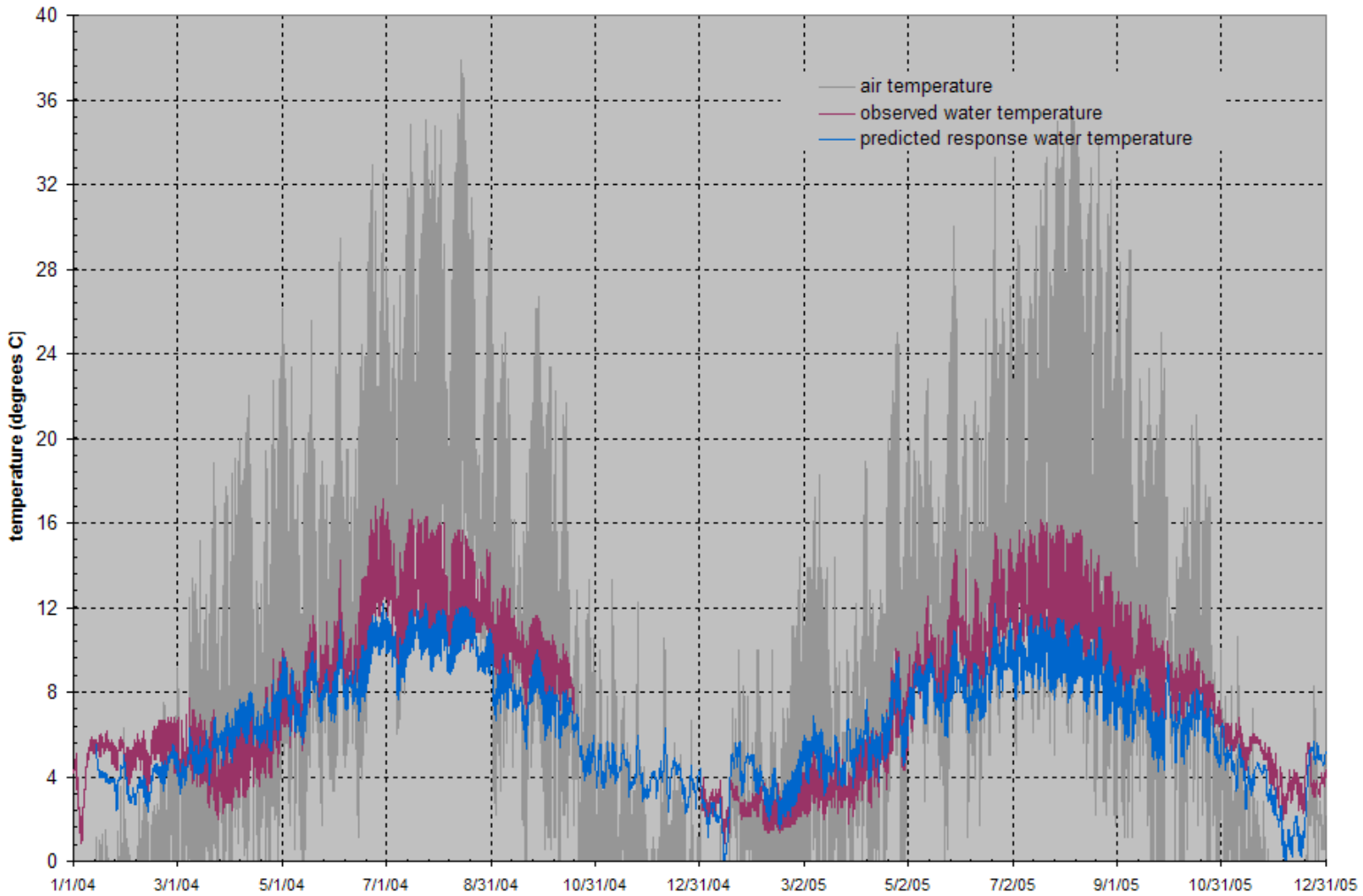
Figure 2. The relationship between Bankfull Width (m) and Effective Shade (%) by Potential Natural Vegetation Groups

Potential Vegetation Zone – Douglas-fir





Pend Oreille River Temperature TMDL: Development of Allocations



PNV Shade Water Temperatures



Pend Oreille River Temperature TMDL: Development of Allocations



Shade allocations for 303(d) listed and temperature impaired sites					
Water Body	Current Effective Shade (%)	Load Allocation (Effective Shade to Achieve Criteria) (%)	Increase in Shade needed (%)	Load Capacity (Site Potential Effective Shade) (%)	Status
Indian Creek	85	91	6	91	Unlisted Impaired
Skookum Creek	90	90	0	94	Meets Criteria
NF Skookum Creek	80	85	5	97	Unlisted Impaired
Calispell Creek below Smalle Ck	0	64	64	81	2004 303(d)
Cee Cee Ah Creek	70	77	7	96	Unlisted Impaired
Tacoma Creek	70	81	11	87	Colville NF TMDL
Cusick Creek	53	82	29	96	Colville NF TMDL
Mill Creek	85	88	3	96	Unlisted Impaired
Middle Creek	85	85	0	97	Meets Criteria
Leclerc Creek	35	43	8	78	Unlisted Impaired
E Br LeClerc Creek (lower)	35	91	56	91	2004 303(d)
E Br LeClerc Creek (upper)	65	90	25	90	2004 303(d)
Ruby Creek	60	83	23	89	Colville NF TMDL
SF Lost Creek	70	83	13	94	Colville NF TMDL
Lost Creek	30	60	30	71	2004 303(d)
Little Muddy Creek	60	67	7	93	2004 303(d)
Big Muddy Creek	75	82	7	93	Colville NF TMDL
Cedar Creek	51	79	28	79	2004 303(d)
Sullivan Creek	25	64	39	64	Colville NF TMDL
Slate Creek	78	78	0	78	Colville NF TMDL
Lime Creek	88	97	9	97	Colville NF TMDL
Flume Creek	85	85	0	85	Colville NF TMDL



Pend Oreille River Temperature TMDL: Development of Allocations



➤ Mainstem shade

- Model requires:
 - Tree height
 - Percent Canopy
 - Left and Right Bank
- Developed from USFS coverage

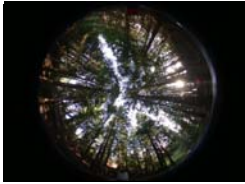


Pend Oreille River Temperature TMDL: Development of Allocations



➤ Mainstem shade

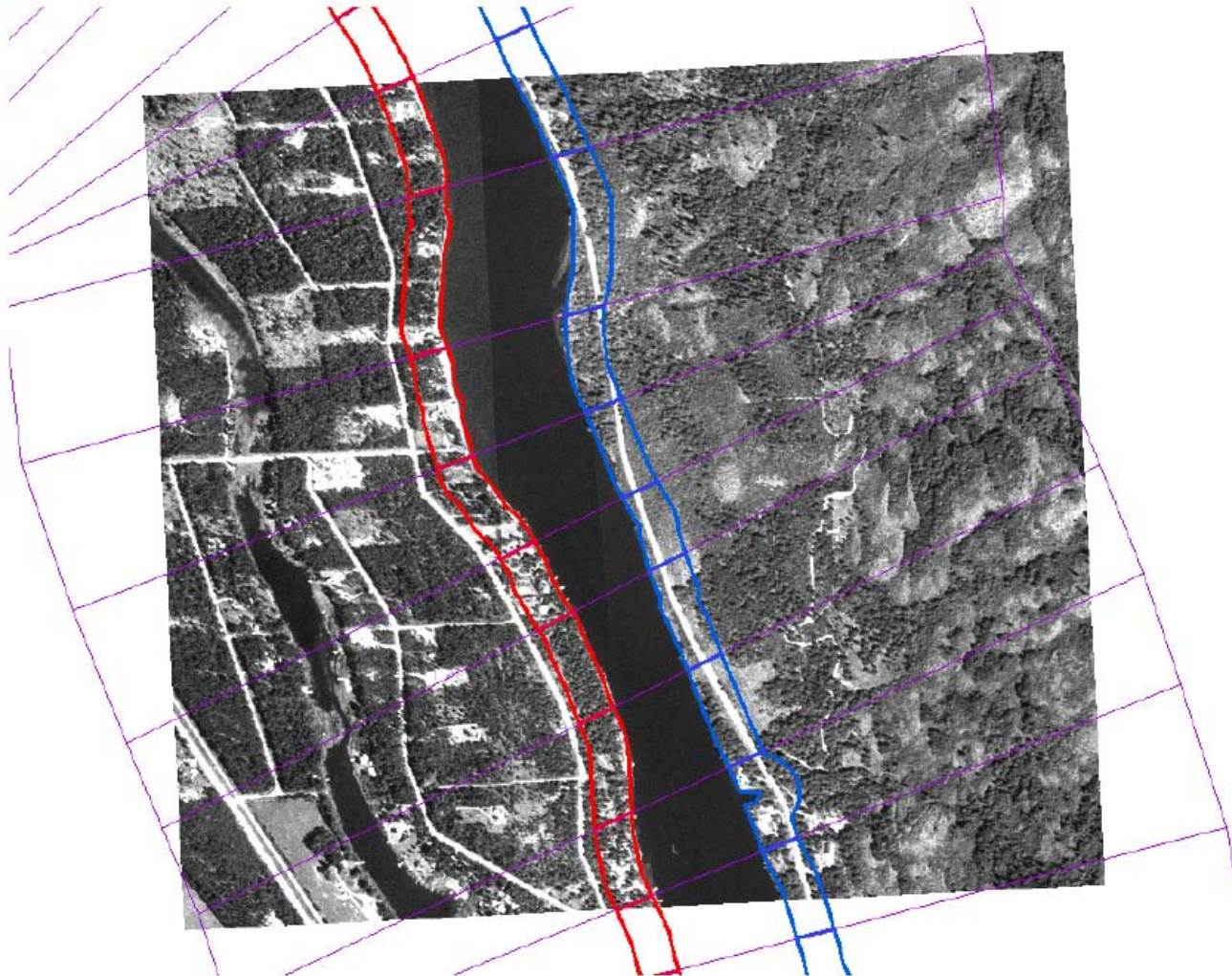
- Model requires:
 - Tree height
 - Percent Canopy
 - Left and Right Bank
- Developed from USFS coverage

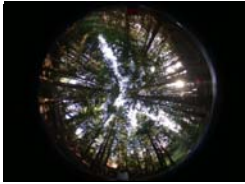


Pend Oreille River Temperature TMDL: Development of Allocations

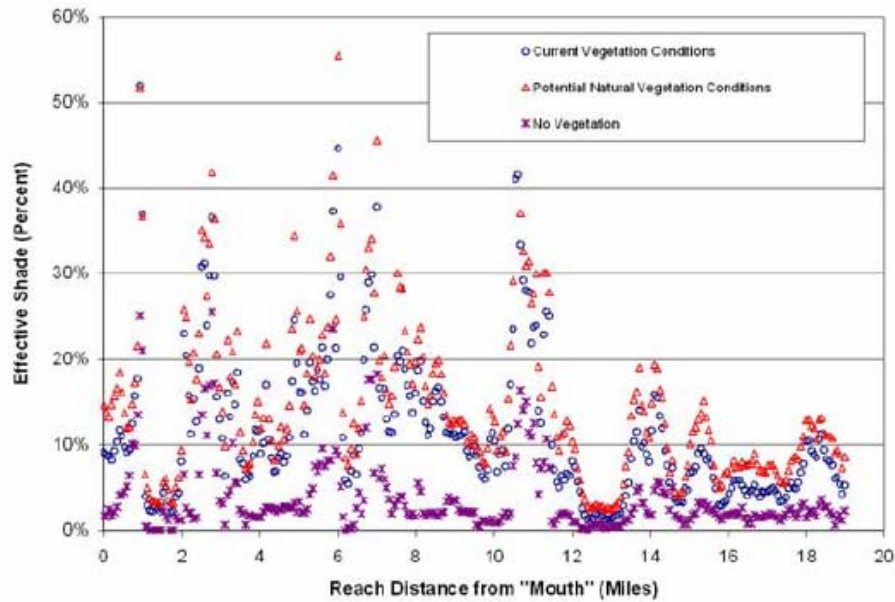


Examplimg of the Sampling Zones
[Purple lines represent model nodes, Red and Blue lines represent
300 foot buffers for each of the model nodes.]



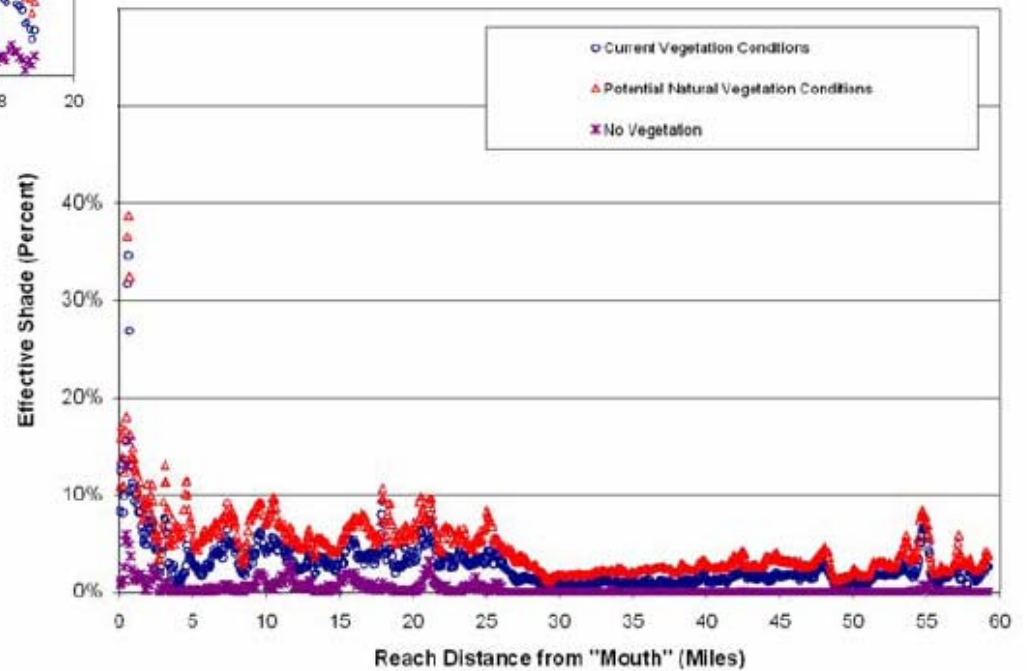


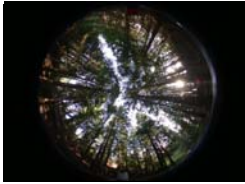
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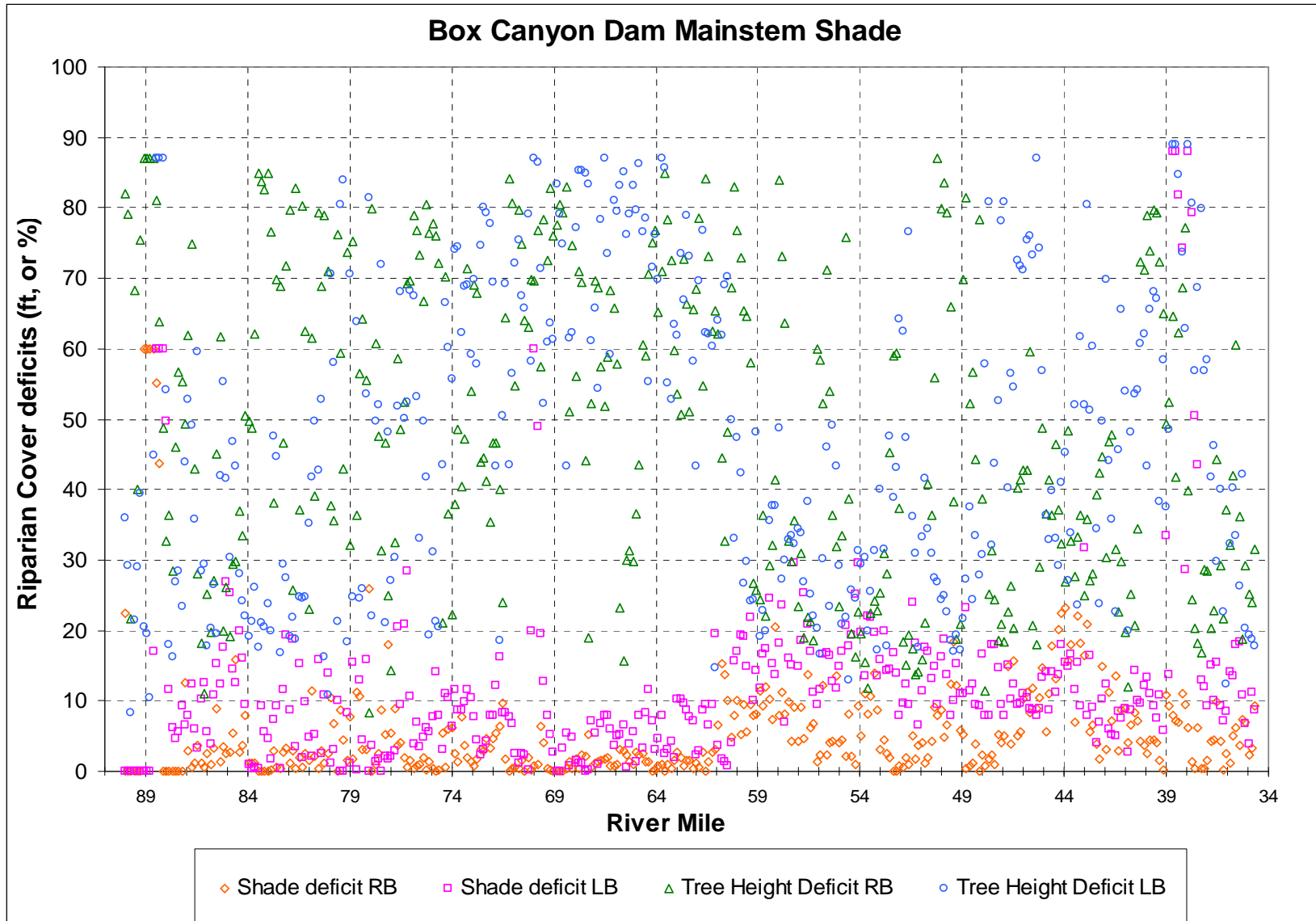
Effective Shade –
Boundary Reach

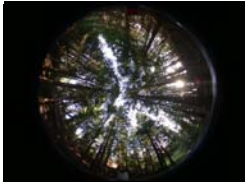
Effective Shade – Box
Canyon Reach



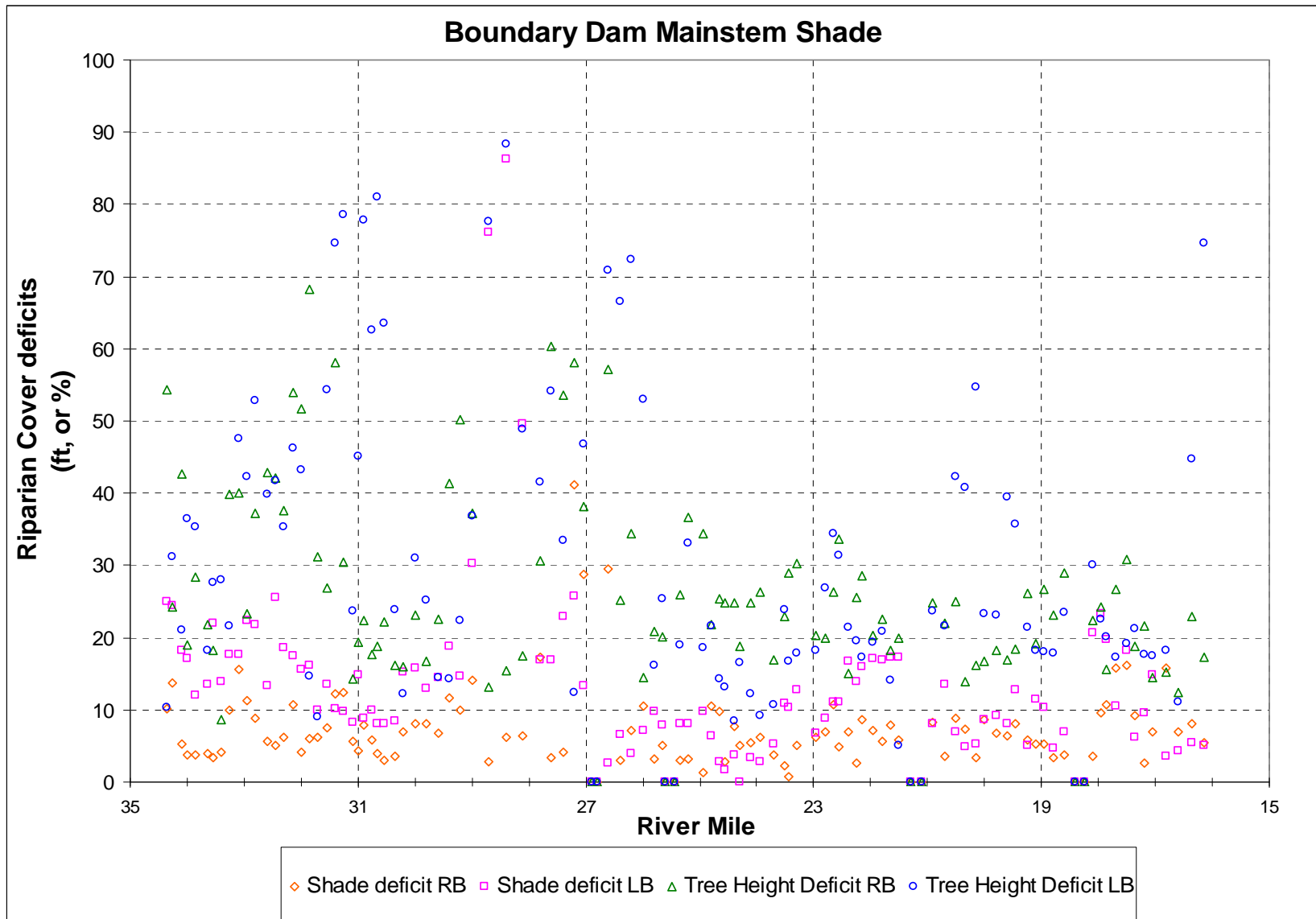


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Pend Oreille River Temperature TMDL: Development of Allocations



➤ NPDES Wasteload Allocations

- All NPDES discharges must have WLA
- WLA is in terms of kilocalories/day
 - Based on current temperatures and flows
 - Calculated for four seasons
- Reserve for future growth
 - Based on State growth projections of 30%
 - Divided between Tribal lands (5%) and State (25%)



Pend Oreille River Temperature TMDL: Development of Allocations



Pend Oreille River Temperature TMDL Proposed Wasteload Allocations

Facility	Winter (Jan-Mar)			Spring (Apr-Jun)		
	Flow (m ³ /sec)	Temp (deg C)	Load (10 ⁶ kcal/day)	Flow (m ³ /sec)	Temp (deg C)	Load (10 ⁶ kcal/day)
Newport WWTP	0.022	10.6	20.1	0.022	20.4	38.5
Ponderay Newsprint Company	0.252	32.2	701.1	0.252	32.2	701.1
Ione WWTP	0.021	10.6	19.2	0.021	23.8	43.2
Selkirk School District #70	0.00022	8.5	0.2	0.00022	17.5	0.3
Metaline WWTP	0.0076	8.5	5.6	0.0076	17.5	11.5
Metaline Falls WWTP	0.0206	11.6	20.5	0.0206	30.5	54.2
Pend Oreille Mine (Tech Cominco)	0.063	21.4	116.7	0.063	21.4	116.7
Future Reserve - Washington			220.8			241.4
Future Reserve - Kalispel Tribe			44.2			48.3
Facility	Summer (Jul-Sep)			Fall (Oct-Dec)		
	Flow (m ³ /sec)	Temp (deg C)	Load (10 ⁶ kcal/day)	Flow (m ³ /sec)	Temp (deg C)	Load (10 ⁶ kcal/day)
Newport WWTP	0.022	25.2	47.6	0.022	19.0	35.9
Ponderay Newsprint Company	0.252	32.2	701.1	0.252	32.2	701.1
Ione WWTP	0.021	25.2	45.6	0.021	19.0	34.4
Selkirk School District #70	0.00022	20.9	0.4	0.00022	16.6	0.3
Metaline WWTP	0.0076	20.9	13.7	0.0076	16.6	10.9
Metaline Falls WWTP	0.0206	25.2	44.8	0.0206	19.0	33.7
Pend Oreille Mine (Tech Cominco)	0.063	21.4	116.7	0.063	21.4	116.7
Future Reserve - Washington			242.5			233.2
Future Reserve - Kalispel Tribe			48.5			46.6