

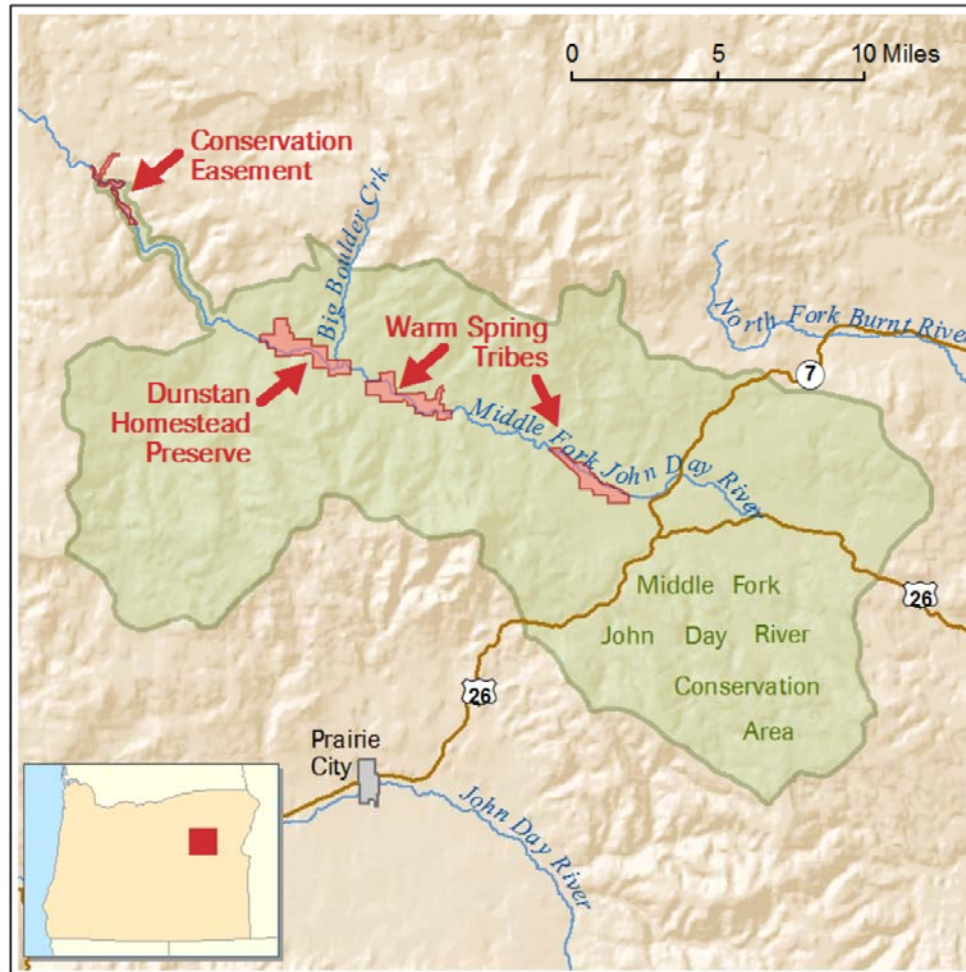
A (way) Before and After Inventory  
of Salmonid Habitat on the Dunstan  
Preserve, John Day Basin, OR.

Joe Lemanski

John Day Basin Habitat Restoration Monitoring Biologist  
Confederated Tribes of Warm Springs Reservation of Oregon  
Watershed Sciences Conference, 2018

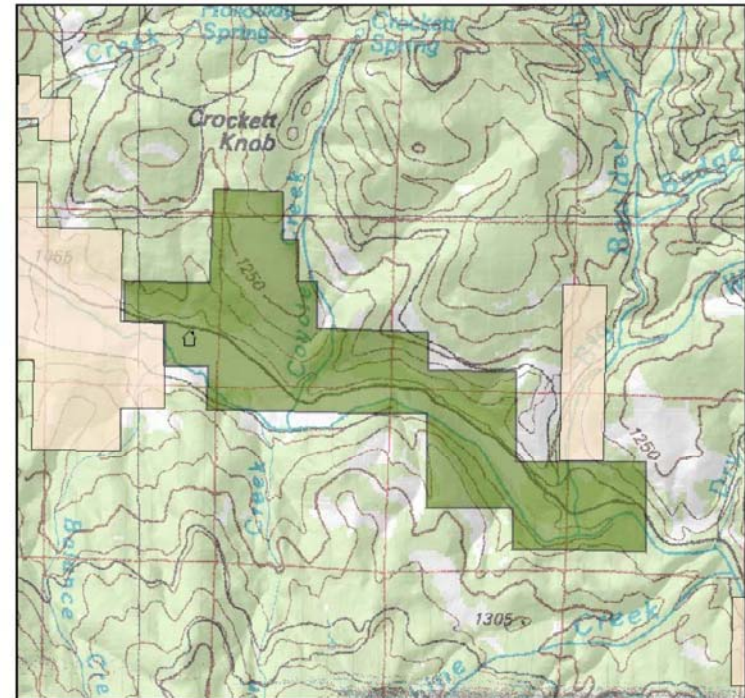
# Dunstan Preserve - Location

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# Dunstan Preserve - History

- 1,220 Acre Cattle Ranch ????-1990
- Rip-Rap Placement in 1960/70's
- Acquired by TNC in 1990
- ODFW Riparian Fencing Program in 1991
- Commercial/Non-Commercial thinning (various years)
- Summit Wildfire in 1996
- 2007 - Bureau of Rec. Large Wood Project
- 2015 - CTWS Low Flow Enhancement Project



**Legend**

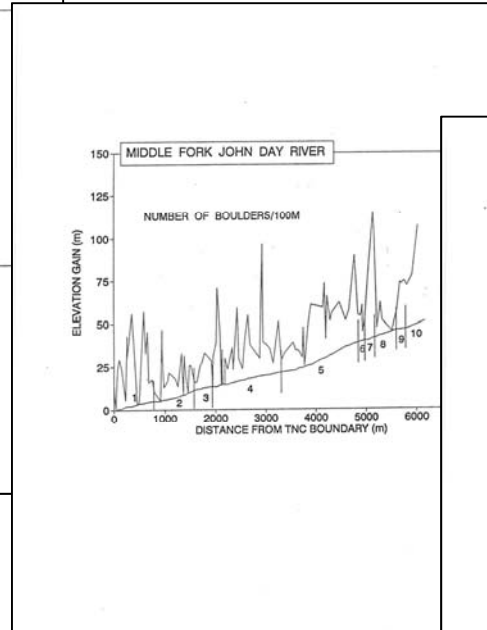
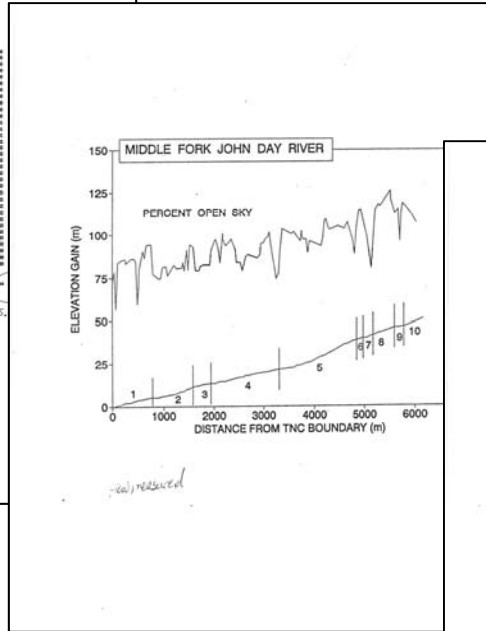
- Dunstan Homestead Preserve
- Other Private Lands
- 🏠 Preserve Headquarters with Historic Buildings
- All Other Lands National Forest



# 1992 Habitat Survey

Distance from left bank (m) (left bank being upstream)  
 Stage of flow (low, medium, high)  
 Direction of flow (upstream, downstream, etc.)  
 Date: \_\_\_\_\_

STATION	TYPE	DISTANCE	CODE	NOTE 1	NOTE 2
1	CP	36	RRV	INCLUDE POOL REFERENCE	PHOTO 1-12
2	R	48			TRIFURCATION ROAD
3	OL	103	RRV		
4	LP	152	RRV		
5	R	235	JRW		REACH 10-11
6	LP	260	RRV		
7	SC	267	RRV		2 SCOUR POOLS
8	OL	268	RRV		
9	R	412	JRW		START @ FENCELINE
10	OL	454	RRV		
11	R	487	RRV		SPRING FED-1 CHANNEL PHOTO #3
12	AL				
13	P	511	RRV	FRIDGE	NATURE CORPERS - PONDROSA
14	LP				STREAM BAR 2
15	R	508	JRW	SP SCREENED	DIVERSION DAM ON RIGHT SIDE
16	LP	403	JRW		NO BIRNBAUM PHOTO #4
17	LP	807	RRV		15% OUTFLOW
18	LP	807	RRV		
19	OL	881	RRV		
20	LP	797		SECTION FLOW	PHOTO 4-REACH 3
21	LP	814			
22	OL	810	RRV		
23	OL	843	RRV		
24	R	1208	RRV		EXCLUSION ISLAND
25	OL	1366	RRV		
26	R	1403	RRV		
27	OL	1403	RRV		
28	R	1480	RRV		10% LPS @ LOWER SIDE OF ISLE
29	OL	1582	RRV		
30	R	1629	JT	FL QUINCY CREEK	QUINCY CREEK PHOTO #8
31	R	1703		TIB T-100	TIB T-100 (QUINCY)
32	OL	1703		T-200	
33	R	1918		8' SP KITCHEN	
34	LP	1945	RRV		
35	R	1948	TJ	COYOTE CREEK	COYOTE CREEK
36	R				COYOTE CREEK T-200
37	LP	2012	RRV		3 WINGS
38	LP	2038	RRV		3 SPRING CHOOK
39	R	2085	RRV	EXCLUSION	
40	LP	2158	RRV	A-SPRINGERS	
41	LP	2158	RRV		
42	LP	2138	RRV		
43	OL	2346	RRV		SPRING CHOOK
44	OL	2405			
45	R	2529		ISLAND	
46	OL	2580	RRV		REACH 7 RUNT
47	R	2678	RRV		4 WINGS
48	OL	2920	RRV		
49	SC	2943	RRV		
50	OL	2965	JT	FL DRY OLD DEERS TORRENT	UNNAMED TRIP DRY
51	R	3038	RRV		4 SPRINGERS
52	LP	3075	RRV		5 SPRING CHOOK
53	R	3100	RRV		
54	R	3052	OL	DRY STREAM DIVERSION	DIVERSION NOT IN USE



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# 1992 Habitat Survey – Habitat

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Habitat Type	1992		
	Total Length (m)	W:D	Bldr. Count
Scour Pool	569	10.6	15
Backwater Pool	67	7.1	8
Dammed Pool	36	20.0	1
Glide	1296	34.1	30
Riffle	2550	71.3	37
Rapid	1212	66.0	15
Alcove	20	6.5	1
Step/Cobble	62	151.6	9

Habitat Type	% Substrate Wetted Area					
	S/O	Sand	Gravel	Cobble	Boulder	Bedrock
Scour Pool	18.5	15.3	43.5	15.2	7.8	0.0
Backwater Pool	81.3	0.0	2.5	13.8	2.5	0.0
Dammed Pool	10.0	20.0	50.0	20.0	0.0	0.0
Glide	2.9	11.5	38.3	35.0	12.0	0.6
Riffle	1.6	5.1	47.9	34.7	10.8	0.0
Rapid	8.3	2.5	32.7	35.7	19.7	1.3
Alcove	100.0	0.0	0.0	0.0	0.0	0.0
Step/Cobble	0.0	2.0	47.2	50.0	0.6	0.0

# 1992 Habitat Survey – Summary

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- 134 Habitat Units
- Total Length: 6,404 m
- Large Boulders: 1,220
- Large Wood Count: 71 (~ 1.14 pieces/100m)

Habitat Type	1992 Habitat Type Metrics		
	# Units	Wetted Area (m <sup>2</sup> )	% of Total Wetted Area
Scour Pool	15	5157	6.1%
Dammed & BW Pool	9	774	0.9%
Glide	30	15962	18.8%
Riffle	48	41990	49.5%
Rapid	15	19717	23.2%
Alcove	1	51	0.1%
Cascade	0	0	0.0%
Step Pool	9	1158	1.4%

# Dunstan Preserve - Restoration

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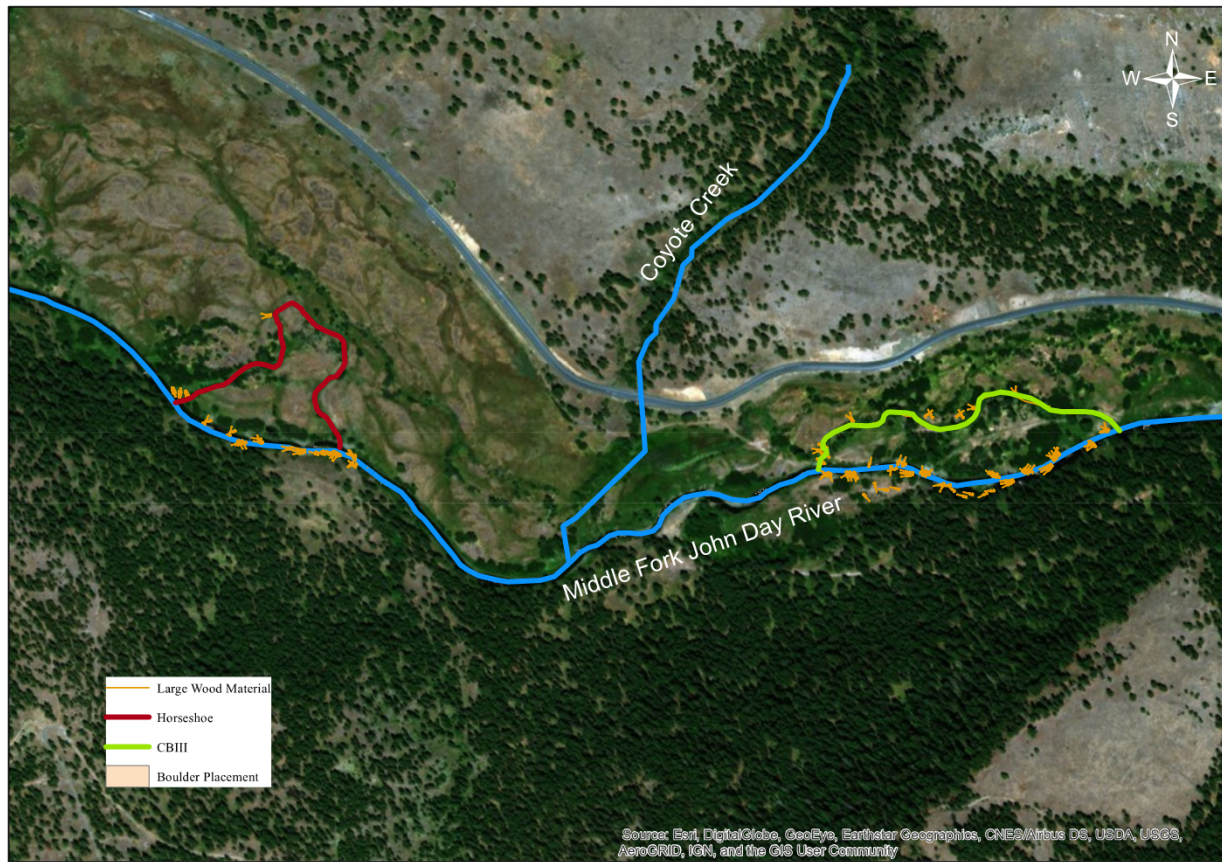
## Restoration Actions (CTWS\*):

- 22 Anchored Log Structures
- 3 Small Alcove Enhancement Structures
- Pool Habitat Excavation
- 1050 ft. Seasonally-Wet Side Channel Habitat
- Removal of 20 Rock Barbs
- Removal of 260 ft of Riprap
- 13 Large Boulder Complexes
- Reuse of boulders for Instream Roughness
- Planting of 4,725 Rooted Plants

(\*Metrics for 2007 BOR restoration project not listed)

# Dunstan Preserve - Restoration

## CTWS Dunstan Preserve Low Flow Enhancement



0 65 130 260 390 520 Meters



# 2017 Habitat Survey

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Habitat Type	2017		
	Total Length (m)	W:D	Bldr. Count
Scour Pool	2037	10.8	534
Backwater Pool	121	4.6	11
Dammed Pool	53	5.0	1
Glide	394	41.1	74
Riffle	3705	40.8	1335
Rapid	174	29.3	61
Alcove	23	5.7	5
Step/Cobble	60	63.5	10

Habitat Type	% Substrate Wetted Area					
	S/O	Sand	Gravel	Cobble	Boulder	Bedrock
Scour Pool	1	9	43	37	9	1
Backwater Pool	17	24	34	24	2	0
Dammed Pool	17	25	40	18	0	0
Glide	0	8	41	42	8	0
Riffle	0	6	42	41	11	0
Rapid	0	4	31	50	15	0
Alcove	21	18	33	25	3	0
Step/Cobble	0	4	48	44	5	0

# 2017 Habitat Survey – Summary

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- 162 Habitat Units
- Total Length: 7,440\* m
- Large Boulders: 2,044
- Large Wood Count: 818 (~ 13.2 pieces/100m)

Habitat Type	2017 Habitat Type Metrics		
	# Units	Wetted Area (m <sup>2</sup> )	% of Total Wetted Area
Scour Pool	57	17,704	27.5%
Dammed & BW Pool	18	351	0.5%
Glide	10	4,837	7.5%
Riffle	62	39,302	61.0%
Rapid	7	1,505	2.3%
Alcove	2	39	0.1%
Cascade	0	0	0.0%
Step Pool	6	694	1.1%

\* Additional ~1,055 linear feet of side channel habitat included

# Habitat Survey Results

## 2017 Results – 1992 Results

Habitat Type	# Units	Wetted Area (m <sup>2</sup> )	% of Total Wetted Area
Scour Pool	42	12547	21.40
Dammed & BW Pool	9	-423	-0.37
Glide	-20	-11125	-11.31
Riffle	14	-2688	11.49
Rapid	-8	-18212	-20.91
Alcove	1	-12	0.00
Cascade	0	0	0.00
Step Pool	-3	-464	-0.29

Habitat Type	% Substrate Wetted Area					
	S/O	Sand	Gravel	Cobble	Boulder	Bedrock
Scour Pool	-17.5	-6.3	-0.5	21.8	1.2	1.0
Backwater Pool	-64.3	24.0	31.5	10.3	-0.5	0.0
Dammed Pool	7.0	5.0	-10.0	-2.0	0.0	0.0
Glide	-2.9	-3.5	2.8	7.0	-4.0	-0.6
Riffle	-1.6	0.9	-5.9	6.3	0.2	0.0
Rapid	-8.3	1.5	-1.7	14.3	-4.7	-1.3
Alcove	-79.0	18.0	33.0	25.0	3.0	0.0
Step/Cobble	0.0	2.0	0.8	-6.0	4.4	0.0

# Habitat Survey Results (cont'd)

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## 2017 Results – 1992 Results

- 11.5x Large Wood
- 2x Large Boulder Count
- ~1km Side Channel Habitat
- Several Decreases in W:D
- 3.1x # Pools
- 25% increase in # Habitat Units

Habitat Type	Total Length (m)	W:D	Bldr. Count
Scour Pool	1468	0	519
Backwater Pool	55	-3	3
Dammed Pool	17	-15	0
Glide	-902	7	44
Riffle	1155	-30	1298
Rapid	-1038	-37	46
Alcove	3	-1	4
Step/Cobble	-2	-88	1

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# Conclusions

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- Improved habitat complexity and suitability
  - Juveniles
  - Adults



## Next Steps:

- Corroborate with fish data.
- Investigate effects of increased floodplain interactions further.
- Riparian vegetation comparisons.

# Questions?

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