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July 2, 2013

MEMORANDUM

TO: Fish and Wildlife Committee

FROM: Tony Grover, Director, Fish and Wildlife Division

SUBJECT: Staff summary of Fish Tagging Forum recommendations and supplemental information.

The Fish Tagging Forum (Forum) made final recommendations to the Council, which were presented to the Fish and Wildlife Committee at the May 7, 2013 committee meeting in Boardman, Oregon. The Forum's recommendations cover several tag types, The following recommendations, with a near-term, mid-term or long-term time frames for implementation are presented as the Forum's consensus, unless presented as alternatives for those few recommendation that do not have the Forum's consensus. A near term recommendation is meant to be implemented immediately after the Council adopts the recommendation. Mid-term recommendations are meant to be implemented over the next year. Long-term recommendations are designed to be implemented over three to five years to allow implementers time to adjust to the effects of the recommendations.

Table 1. Consensus recommendations of the Fish Tagging Forum

	Type	Forum Consensus Recommendations	Timeframe
1	Global	Any reduction in funding associated with the recommendations would be available for redirection to other F&W projects.	Near term
2	Global	NOAA to provide guidance in coordination with state, tribal, and other researchers/experts regarding best practices for tagging ESA-listed salmonids.	Mid-term
3	PIT	Implement an annual PIT tag coordination and review forum including federal, state, tribal, utility representatives and other entities for both fish and wildlife projects with the purpose of	Near term

		<p>reviewing short-term and long-term study plans relying on the use of PIT tags to;</p> <ul style="list-style-type: none"> i - Evaluate opportunities to increase efficiency of tag use in a way that minimizes costs and reduces the number of fish tagged; and ii - Provide input and review of the PIT tag forecasting system for the purchase of PIT tags in the Columbia Basin 	
4	PIT	Council sponsor periodic subject matter expert evaluations of rates of PIT tag loss and effects of tagging on fish behavior and survival throughout the life cycle to understand how it affects confidence in critical parameters derived from PIT tag studies.	Long term
5	PIT	Council utilize the IEAB and ISAB to work together with interested regional partners to develop an analytical tool to evaluate trade-offs between PIT tagging levels, detector arrangements and the accuracy and precision of parameters used in making priority management decisions.	Long term
6	PIT	At the completion of the current PIT tag harvest monitoring project (2010-036-00), the Council and ISRP should follow a deliberate and measured approach to evaluate the project.	Long term
7	CWT	Eliminate routine coded wire tagging of steelhead and sockeye because they are not sampled in the ocean at levels significant enough to influence decision making (see Table 9). However, some coded wire tagging of these species will be necessary for specific research projects and hatchery operations and evaluations.	Long term
8	Genetic	Funding of on-going FWP projects developing and evaluating genetic methods (GSI and PBT) should continue consistent with the projects' goals and objectives. After 5-10 years of monitoring have been completed the effectiveness and efficiency of the genetic methods should be evaluated for broader application. The funding of new projects within the FWP should follow a deliberate and measured approach to consider how those new projects would complement existing projects.	Long term
9	Acoustic	Recommends twenty or more year interval between JSATS studies at USACE operated dam(s) unless major modifications to the structures or operations at the dams require updated information about fish survival at the dam(s). Furthermore, before future JSATS studies are implemented the Corps of Engineers, in collaboration with NOAA Fisheries and the Council, should evaluate whether existing, less expensive, tag technologies could be used and if acoustic tags are the appropriate technology for the research objectives, then what is the appropriate data collection required (i.e., presence/absence, two-dimensional or 2D, or three-dimensional or 3D, which provides depth information), to provide adequate information to assess juvenile survival at the dam(s) at a lower cost.	Near term
10	Acoustic	Within one year of date of this recommendation The Corps of Engineers in consultation with NOAA should develop a long term	Mid-term

		20 year plan for acoustic tag studies within the Columbia and Willamette River basins. This plan should include the purpose of studies, coordination planning to be done with other entities that may be using acoustic tags, locations of the studies, study dates and estimated costs for acoustic tag studies that are envisioned over the next 20 years. This plan should be shared with the Council and the region for comment.	
11	Acoustic	Council should sponsor a public review of the USACE 2014 to 2018 forecast for JSATs performance testing cost and schedule for potential additional efficiencies and associated cost savings.	Near term
12	Radio	Council should continue to support the use of radio tags for specialized purposes to meet the evaluation criteria for specific research objectives and should continue to be used when appropriate for short-term study designs.	Near term
13	Data	Extend PERC process to evaluate potential improvements in the PIT tag and CWT regional databases (PTAGIS and RMIS) that provide important data sharing and analysis, leading to good decision making for our shared salmon resource on the Pacific Coast.	Mid term
14	Data	Implement a regional SNPs genetics database at PSMFC that can be shared in the same manner as the current PTAGIS and RMIS databases.	
15	Data	Link the PTAGIS, RMIS, and SNPs databases to bring more power to these databases, leading to easier and more complete regional mark/tag data analysis (i.e. linking fish with multiple marks or tag in these databases).	
15	Data	Through BPA contracting procedures, provide better documentation of tagging protocols through MonitoringMethods.org .	Near term
17	Data	Evaluate the costs and benefits of incorporating tag-related cost-tracking components into future upgrades to PISCES, and CBfish.Org	Long term

Forum Non-consensus Recommendation

The Forum could not reach a consensus recommendation on the funding responsibility for all Coded Wire Tag uses, therefore alternatives have been identified for funding CWT activities. The proponents for each alternative may present their thoughts on merits and consequences of each alternative to the F&W Committee and Council directly and/or in writing.

- i. Alternative 1: Maintain status quo funding [\$7.5 million]
- ii. Alternative 2: Over 3 year transition period, reduce BPA funding for fishery catch sampling and associated analysis [Eliminates \$1.9 million in annual project funding]¹. <http://www.nwcouncil.org/media/6827185/CWT-cost-spreadhseet-by-Bonneville-4-8-13-related-to-recommendation-1b.xlsx>

¹ These recommendations do not apply to projects funded under the fish and wildlife accords.

- iii. Alternative 3: Over a 3 year period, reduce BPA funding for tagging at Mitchell Act Hatcheries [Funding reduction of \$0.6 million]³
- iv. Alternative 4: Increase CWT funding, if necessary, to achieve CWT program objectives (e.g., desired sampling rate at 20%)

Supplementary information to inform Committee members’ deliberations regarding the non-consensus Fish Tagging Forum recommendations.

Table 2. Projects that may have potential funding adjustments based on the non-consensus recommendations:

Project Number, Name, & Sponsor	Task	FY 13 Cost	Funding Adjustment
1982-013-01 (PSMFC CWT)	Spawning ground surveys for CWT retrieval in Oregon tribs in LCR.	\$100,000	\$0
	Commercial & sport CWT recovery in LCR.	\$383,733	-\$383,733
	Oregon coast commercial & sport CWT recovery.	\$336,534	-\$336,534
	Clackamas tag recovery lab	\$187,940	-\$165,028
	RMPC operations	\$198,429	-\$174,238
1982-013-02 (ODFW CWT)	Insert CWTs.	\$176,572	-\$176,572
	Clackamas tag recovery lab	\$18,874	-\$18,874
1982-013-03 (USFWS CWT)	Insert CWTs.	\$58,102	-\$58,102
	Tagging trailer maintenance.	\$25,804	-\$25,804
	Snout recovery and tag decoding at hatcheries.	\$32,741	-\$32,741
1982-013-04 (WDFW CWT)	Insert CWTs.	\$240,742	-\$240,742
	Recover/decode CWTs	\$61,383	-\$61,383
1983-350-03 NPT Hatchery RM&E (Nez Perce Tribe)	Insert CWTs.	\$200,000	\$0
2010-036-00 (WDFW & PSMFC CWT recovery)	Methods development for escapement sampling	\$11,273	\$0
	Spawning ground surveys for CWT retrieval from coho in WA tribs in LCR.	\$393,730	\$0
	Spawning ground surveys for CWT retrieval from coho in WA tribs in LCR.	\$5,000	\$0
	Spawning ground surveys for CWT retrieval from Chinook in WA tribs in LCR.	\$111,469	\$0
	Spawning ground surveys for Chinook retrieval from coho in WA tribs in LCR.	\$25,000	\$0
	Snout recovery at state hatcheries.	\$4,714	-\$4,714
	Snout recovery at state hatcheries.	\$15,000	-\$15,000
	Sport fishery CWT recovery	\$22,022	-\$22,022

	Sport fishery CWT recovery	\$448,602	-\$448,602
	Commercial CWT recovery in LCR.	\$61,676	-\$61,676
	Commercial CWT recovery in LCR.	\$250,000	-\$250,000
	Manage fishery & escapement databases.	\$94,128	-\$94,128
	Manage fishery & escapement databases.	\$35,000	-\$35,000
	PIT, CWT, & escapement data transfer	\$26,985	-\$26,985
	PIT, CWT, & escapement data transfer	\$5,000	-\$5,000
	Analyze data for stock status monitoring purposes	\$51,606	-\$51,606
	Analyze data for stock status monitoring purposes	\$25,000	-\$25,000
	Analyze spawning data	\$47,031	\$0
	Analyze spawning data	\$10,000	\$0
	Disseminate data results to fishery managers	\$2,995	-\$2,995
	Disseminate data results to fishery managers	\$10,000	-\$10,000
	PIT fishery data analysis	\$28,475	-\$28,475
1990-005-00 Umatilla Hatchery RM&E (ODFW)	Insert CWTs and PIT tags	\$178,670	\$0
	Estimate progeny-per-parent productivity of hatchery steelhead and Chinook salmon	\$20,071	\$0
	Creel surveys of Umatilla River non-tribal recreational salmonid fisheries	\$88,084	\$0
	Creel survey data analysis	\$26,125	\$0
1996-043-00 Johnson Creek Artificial Propagation Enhancement (Nez Perce Tribe)	CWT tag recovery and snout handling.	\$60,000	\$0
	Totals:	\$4,078,510	-\$2,754,954

Table 3. Management questions that are informed primarily by coded wire tag data, or where CWT is a strong secondary tag type:

		Tag Type and Importance to Indicator (P=primary; SS=strong secondary (e.g., currently critical and/or emerging primary); WS=weak secondary (e.g., not currently critical); F= future; SP=specialized use; NA=not applicable)								
Management Question	Indicator	Is more than one technology applicable? (1=No; 0=Yes)	PIT	Acoustic	Radi o	CW T	Gen etics	Otol ith	Adip ose	Scal es
Harvest management questions										
1) Are harvest management actions effective in meeting conservation responsibilities (PST, FCRPS relies on data e.g., RPA 62 , US v OR)?	A) Run size forecasts	0	SS	NA	NA	P	SS	NA	NA	NA
1) Are harvest management actions effective in meeting conservation responsibilities (PST, FCRPS relies on data e.g., RPA 62 , US v OR)?	B) In-season updates (abundance-based management)	0	P	NA	NA	P	WS	NA	SS	NA
1) Are harvest management actions effective in meeting conservation responsibilities (PST, FCRPS relies on data e.g., RPA 62 , US v OR)?	C) Post season run reconstruction FCRPS BiOP Limited to specific stocks	0	SS	NA	NA	P	WS	NA	SS	NA
1) Are harvest management actions effective in meeting conservation responsibilities (PST, FCRPS relies on data e.g., RPA 62 , US v OR)?	D) Stock-specific (ESU, MPG etc) harvest by fishery (includes CRB and ocean fisheries)	0	WS	NA	NA	P	SS	NA	SS	NA
1) Are harvest management actions effective in meeting conservation responsibilities (PST, FCRPS relies on data e.g., RPA 62 , US v OR)?	E) ESA-listed population impact rate as well as FCRPS BiOP for selective fishery research projects	0	SS	NA	SP	P	SS	NA	SS	NA
1) Are harvest management actions effective in meeting conservation responsibilities (PST, FCRPS relies on data e.g., RPA 62 , US v OR)?	F) Non ESA-listed population harvest rate	0	SS	NA	NA	P	SS	NA	NA	NA

1) Are harvest management actions effective in meeting conservation responsibilities (PST, FCRPS relies on data e.g., RPA 62 , US v OR)?	G) Area-specific harvest accountability (e.g. harvest sections below BON, sections above BON, or areas in Ocean fishery) -- this may be redundant with question 1D	0	SP	NA	NA	P	F	NA	NA	NA
1) Are harvest management actions effective in meeting conservation responsibilities (PST, FCRPS relies on data e.g., RPA 62 , US v OR)?	H) Release mortality	0	P	F	WS	P	NA	NA	SS	NA
2) Are harvest programs being managed to contribute to recovery of ESA listed populations?	A) Direct and indirect harvest of ESA-listed salmon - required by harvest BiOps	0	SP	NA	NA	P	F	NA	WS	NA
2) Are harvest programs being managed to contribute to recovery of ESA listed populations?	B) ESA-listed population impact rate - required by harvest BiOps	0	SS	NA	NA	P	SS	NA	P	NA
2) Are harvest programs being managed to contribute to recovery of ESA listed populations?	C) Run size forecasts (abundance based management)	0	SS	NA	NA	P	SS	NA	NA	NA
2) Are harvest programs being managed to contribute to recovery of ESA listed populations?	D) In-season updates (abundance based management)	0	P	NA	NA	P	WS	NA	SS	NA
2) Are harvest programs being managed to contribute to recovery of ESA listed populations?	E) Post season run reconstruction	0	SS	NA	NA	P	WS	NA	SS	NA
3) Is harvest effectively managed to meet Treaty Indian/non-Indian allocation requirements and other management responsibilities?	A) Total Treaty and non-treaty harvest by stock in the Columbia River	1	F	NA	NA	P	F	NA	NA	NA
3) Is harvest effectively managed to meet Treaty Indian/non-Indian allocation requirements and other management responsibilities?	B) Total Treaty and non-treaty harvest by stock in U.S. ocean (South of Canada)	1	NA	NA	NA	P	F	NA	NA	NA
3) Is harvest effectively managed to meet Treaty Indian/non-Indian allocation	C) Tributary Harvest	0	F	NA	NA	P	SS	NA	NA	NA

requirements and other management responsibilities?										
3) Is harvest effectively managed to meet Treaty Indian/non-Indian allocation requirements and other management responsibilities?	D) Run size forecasts	0	SS	NA	NA	P	SS	NA	NA	NA
3) Is harvest effectively managed to meet Treaty Indian/non-Indian allocation requirements and other management responsibilities?	E) In-season updates (abundance based management)	0	P	NA	NA	P	WS	NA	SS	NA
3) Is harvest effectively managed to meet Treaty Indian/non-Indian allocation requirements and other management responsibilities?	F) Post season run reconstruction	0	SS	NA	NA	P	WS	NA	SS	NA
3) Is harvest effectively managed to meet Treaty Indian/non-Indian allocation requirements and other management responsibilities?	G) Stock-specific (ESU, MPG etc) harvest by fishery	0	WS	NA	NA	P	SS	NA	SS	NA
3) Is harvest effectively managed to meet Treaty Indian/non-Indian allocation requirements and other management responsibilities?	H) Other state management catch objectives (e.g., sport fisheries, state management objectives/policies)	0	P	NA	NA	P	P	NA	SS	NA
4) Is harvest managed to meet the requirements of International treaties? (PST)	A) Pre-season abundance forecasts for U.S. and Canadian stocks	1	NA	NA	NA	P	F	NA	NA	NA
4) Is harvest managed to meet the requirements of International treaties? (PST)	B) Total harvest by stock in U.S. ocean	1	NA	NA	NA	P	F	NA	NA	NA
4) Is harvest managed to meet the requirements of International treaties? (PST)	C) Total harvest by stock in Canadian fisheries	1	NA	NA	NA	P	F	NA	NA	NA
4) Is harvest managed to meet the requirements of International treaties? (PST)	D) Harvest impact on wild stock indicators	1	NA	NA	NA	P	F	NA	NA	NA
4) Is harvest managed to meet the requirements of	E) Escapement accountability of wild stock indicators (status of PST wild stock	1	NA	NA	NA	P	F	NA	NA	NA

International treaties? (PST)	Indicators)										
Population Status and Recovery management questions											
1) Are the populations (trending towards) meeting the goals of the viability parameters?	d) Productivity (derived indicator based on abundance and diversity data)	0	P	NA	NA	P	SS	F	NA	NA	
2) What are survival rates through various life stages?	c) First year ocean survival (FCRPS BiOP does not have a direct requirement to monitor first yr ocean condition)	1	NA	F	NA	P	NA	NA	NA	NA	
2) What are survival rates through various life stages?	d) First year ocean survival to maturity	1	SP	F	NA	P	NA	NA	NA	NA	
2) What are survival rates through various life stages?	h) Recruit to Spawner: Is the population growing? (derived indicator based on abundance, diversity, and harvest)	0	P	NA	NA	P	SS	SP	NA	P	
4) What conditions affect the relative benefit of in-river passage versus transport?	D) Tributary Survival, Straying Rates	0	P	F	SP	P	P	F	NA	NA	
Habitat related management questions											
3) What is the ocean's /plume effect to population status / recovery?	D (ii) Ocean life histories among returning adults (number of yrs at sea; or determining time spent in plume requiring tagging within plume - or do we want to know how a fish spends its time in ocean/plume if so we need to tag fish within the plume, scale and otolith only marks transition between salt-fresh)	0	P	NA	NA	P	F	SP	NA	P	
3) What is the ocean's /plume effect to population status / recovery?	F) Maturation (maturation rates and age structure)	0	NA	NA	NA	P	WS	NA	NA	NA	
Hatchery related management questions											
1) Are mitigation hatchery programs meeting their specific production goals? (R.G.--DR if BPA-funded tribal hatcheries=mitigation .)	B) Adult harvest/returns/escapement	0	WS	NA	NA	P	SS	NA	SS	NA	

1) Are mitigation hatchery programs meeting their specific production goals? (R.G.--DR if BPA-funded tribal hatcheries=mitigation .)	C) Juvenile to adult survival rates	0	WS	NA	NA	P	SS	SP	NA	NA
2) Are mitigation hatchery programs being managed to meet conservation objectives?	A) Proportion and origin of hatchery fish within natural spawning populations (pHOS)	0	WS	NA	NA	P	SS	NA	P	SP
3) Are conservation hatchery programs reducing the extinction risk of certain listed populations?	A) Adult abundance	0	WS	NA	NA	P	WS	NA	P	NA
3) Are conservation hatchery programs reducing the extinction risk of certain listed populations?	C) SAR - Survival from beginning of downstream migration to return as adults. Metric is used to assess the effect of broodstock and adult escapement reform measures on captive rearing programs and stock rebuilding programs that contribute to the growth of genetic resources and promote recovery of listed populations.	0	SS	NA	NA	P	WS	SP	NA	NA
3) Are conservation hatchery programs reducing the extinction risk of certain listed populations?	D) Proportion and origin of hatchery fish within natural spawning populations (pHOS)	0	WS	NA	NA	P	SS	NA	P	SP
Hydrosystem related management question										
1) Are salmon and steelhead meeting juvenile and adult hydro passage performance standards and targets for the HCP, FCRPS BIOP and Accords?	B) Hydrosystem Survival adults	0	P	SP	SP	SS	F	NA	NA	NA

Legal: Bonneville spending authority and in-lieu considerations.

Bonneville customer groups, and Bonneville itself, have raised questions about whether this use of Bonneville funds, despite its long tenure, is actually outside of Bonneville’s authority to spend funds under the Northwest Power Act, or is in violation of what is known as the “in lieu” provision of the Act, or both. Council Member Rockefeller asked for our analysis and advice on the legal issues.

Continuing these Bonneville expenditures is neither prohibited nor required by law. It is appropriate to raise the in lieu and responsibility issues -- and they have been raised, frequently, in the last decades with regard to Bonneville funding of coded-wire tag efforts. But the facts are such that it is possible to understand why Bonneville funding of some level could be appropriate under the Act and not displacing other funding in violation of the “in lieu” provision. Stated the other way, the facts do not lead to a conclusion that Bonneville funding in this area is obviously outside of the range of its authority or obviously is supplanting the expenditures authorized or required by others -- essentially, that is why this Bonneville contribution began and has been ongoing for 30 years. The Council is not going to resolve this question by being able to say the expenditures at issue are clearly prohibited or clearly required by law. Instead, in our opinion, this comes down to a question of policy and priorities in a world of overlapping responsibilities and authorities, rather than the hard line of the law.

Costs: Fair share considerations:

The question as to what is the fair share contribution of Bonneville funding for coded wire tag efforts appears to be a matter of policy and should be considered from the perspective of coast-wide tagging and Columbia River basin tagging. CWT information is still coming in for 2012, but 2011 information of insertions by species is shown in Table 4.

Table 4. Total number of CWT, by species, inserted in 2011, for the Columbia Basin and Pacific region.

Species	Columbia Basin CWT	Other CWT	Total CTW
Chinook	23,383,741	28,352,968	51,736,709
Coho	3,592,384	4,777,031	8,369,415
Steelhead	2,616,073	329,135	2,945,208
Sockeye	415,567	25,548	441,115
TOTAL	30,007,765	33,484,682	63,492,447

Condensed from a table provided by: Dan Webb, Regional Mark Processing Center

The data in the above table show clearly that Chinook salmon is the species subject to the greatest amount of tagging with CWT. The greater number of tags, and often higher tag rates, result in Chinook salmon being used more widely to inform management questions. Steelhead are not subject to commercial harvest in the ocean and thus are CWT less intensely than Chinook and coho, which are targeted by ocean salmon fisheries.

For CWT there is a broad geographic and species coverage (Table 5), but it is predominantly used for Chinook and coho, due to the existence of coast wide sampling programs for tag recovery. CWT tagging coverage is lacking for chum salmon because they are too small to tag with CWT and they are relatively rare in the Basin. Sockeye and chum are not CWT in large numbers because CWT sampling programs for them are generally very limited. Wild stocks such as wild steelhead are typically not CWT because of logistical difficulties. The other zeros in the

table generally reflect the few populations, low abundance, or lack of CWT needed for harvest information.

Table 5. 2011 CWT releases by Columbia Basin region and species.

Description	Region	Spring CK	Summer CK	Fall CK	Coho	Sockeye	Chum	S. Stlhd	W. Stlhd	Totals
Below Bonneville	L Col	1,998,146	NA	1,565,700	1,998,194	NA	0	0?	20,491	5,582,531
Bonneville - McNary	M Col	1,412,129	NA	3,192,336	208,684	0	NA	62,146	0	4,875,295
Snake R Basin	Snake	3,128,425	527,219	3,702,296	121,547	184,198	NA	2,019,140	NA	9,682,825
Above McNary	U Col	2,437,495	3,321,622	2,098,373	1,263,959	231,369	NA	514,296	NA	9,867,114
	Totals:	8,976,195	3,848,841	10,558,705	3,592,384	415,567	0	2,595,582	20,491	30,007,765

For the purposes of estimating costs, direct, indirect and reimbursable costs to BPA are included. BPA and US Army Corps of Engineers staff have estimated cost-related information for each tagging technology that includes all activities, including tag insertion costs, tag detection costs and analysis of data generated from the tags. The estimated tagging costs in FY2012, shown in Table 7, below, are considered generally accurate, though not precise. Acoustic tag costs will vary quite a bit from year to year depending on how many US Army Corps of Engineers dam passage performance standard studies in Columbia/Snake River or Willamette Basin studies need to be conducted. BPA costs include direct costs, indirect costs and reimbursable costs (Table 6).

Table 6. BPA's best estimate of all BPA funded 2012 tagging costs for insertion, detection and analysis of the tagging data for direct, indirect and reimbursable costs.

Funding Source	Tag Technology						TOTALS
	CWT	PIT	Genetic	Radio	Acoustic	Other	
Fish & Wildlife Program	\$5,434,900	\$18,219,745	\$7,780,782	\$1,897,782	\$951,585	\$1,474,317	\$35,759,111
LSRCP	\$1,218,287	\$1,909,000					\$3,127,287
COE	\$858,903	\$3,663,546		\$234,600	\$17,559,502	\$219,000	\$22,535,551
TOTALS	\$7,512,090	\$23,792,291	\$7,780,782	\$2,132,440	\$18,511,087	\$1,693,317	\$61,422,007

There are limitations in available data that make it difficult to precisely estimate the CWT cost share. The Forum considers these estimates to be a reasonable representation. The current CWT program is about \$21.2M, with the BPA cost share to \$7.5M or approximately 35% of the funding for the CWT tagging and recovery program (Figure 1). The remaining \$13.7M of the CWT program is funded by others. This represents a minimum because CWT data analysis cost from co-managers were not included.

Figure 1. BPA estimated funding for CWT tagging, recovery and data management for salmon and steelhead fisheries, compared to other agencies' funding for only CWT tagging and recovery. There are additional substantial expenditures by other agencies on CWT data management and analysis that are not included.

