FISH HABITAT TASKS

FISH HABITAT TOTAL COST ESTIMATE: $2,171,000

TASK #	FOUNDATION HYPOTHESIS	SUBHYPOTHESIS	INFORMATION/MODELING NEEDS	SUBTASKS	PRIORITY	ESTIMATED COST	RATIONALE	NOTES	
FH1-1	Recreating a complex dynamic alluvial river will increase salmonid habitat quantity and quality	Complex habitats will have greater fish numbers/density than simple habitats	Conduct workshop and peer review to: 1) develop habitat complexity metric, and 2) fish response to that metric incorporating fish numbers/density for all life stages of steelhead, coho salmon and chinook salmon.	Identify and recruit outside experts, conduct workshop - arrange purchase orders for their participation; prepare background materials and send to experts 2 wks prior to workshop; conduct and facilitate workshop; prepare experimental design document	High	$40,000	Need a quantitative and repeatable method for documenting complex habitats and how fish use them. Controversy over the years on how to do this needs to be resolved	Not in 3-year action plan, Workshop will be at least $30,000	
FH1-2			Document habitat quantity, habitat complexity and fish use/numbers at bank rehabilitation sites and control sites using protocol developed from above workshop.	Determine habitat quantity, habitat complexity, photo points, and fish use/numbers at 8 proposed sites and 4 control sites for FY 2002, establish photo points at remaining 8 sites.	High	$250,000	Develop and measure the channel complexity metric and fish response. Implement monitoring effort prior to channel rehabilitation work in order to secure pre-implementation information for comparative purposes.	Reduce from $340,000 awarded FY2001 with better coordination.	
FH2-1		Recreating a complex dynamic alluvial river will increase salmonid smolt production from the Trinity River	Continue using SALMOD as predictive tool for salmonid smolt production, develop habitat characterizations for input into SALMOD.	Identify and recruit outside experts to evaluate future fish production modeling approach - arrange purchase orders for their participation; prepare background materials and send to experts 2 wks prior to workshop; conduct and facilitate workshop; come to agreement on model (if any); prepare experimental design/workshop summary document.	Medium	$40,000	Improve smolt production predictive model to help evaluate flow management, sediment management, and channel rehabilitation effects on smolt production. There is considerable disagreement over 1) whether a production model is needed, and 2) what model should be used. This workshop will attempt to develop a strategy for the program in future years. Using a model would retain predictive capability and utility during and after channel response to restoration and flow regime.	SALMOD component. Some integration with tasks FH1, FP2, FP3, FP4, FP9 - all suggesting folding of results into SALMOD or some other production model.	
FH 2-2			Producting model refinement	Following workshop, provide funding to re-ingage modeling process: data review, data comilation since the Flow Evaluation Study, Develop recommendations for future modeling data needs.	Medium	$40,000	Begin gathering data and incorporating into model. Really begin using model as a tool in FY 2003	Potentially SALMOD, but depends on outcome of workshop	
FH3-1			Install weirs and monitor adult harvest to estimate total adult production, with better separation of natural vs. hatchery produced component (harvest and in-river escapement).	Run-size and harvest estimate through operation of Junction City and Willow Creek weirs. Hatchery/Natural estimation. Reward tags for mark-recovery estimation through angler harvest, hatchery return, etc.	High	$372,000	Annual spawning escapement and harvest estimates of spring and fall chinook salmon, coho salmon, and steelhead trout are necessary to assess the status of the populations. These data are used to assess status of the spawning populations and, through cohort reconstruction, assess how freshwater and marine environmental conditions influenced salmon production and the effectiveness of harvest regulations. To evaluate restoration program performance towards goals. None of these were specifically split out and individually ranked in the adaptive management workshop. These are merely lifted out of the Three year action plan.	Harvest monitoring, weirs, carcass surveys, creel census, hatchery returns, etc. Funding for CDFG administration has been removed from this task and placed in Administration in Infrastructure/Implementation category	
FH3-2				Angler Harvest estimation Klamath Estuary to Coon Cr	Medium	$65,000	Provides area specific harvest data for this section of the Klamath.	Given medium rank due to low percentage of sport fishing harvest compared to total harvest	Cost from three year action plan forwarded by ad-hoc group.
FH3-3				Angler Harvest estimation Lower Klamath	Medium	$20,000	Provides area specific harvest data for this section of the Klamath.	Given medium rank due to low percentage of sport fishing harvest compared to total harvest	Cost from three year action plan forwarded by ad-hoc group.
FH3-4				Angler Harvest estimation Weitchpec to Hawkins Bar	Medium	$72,000	Provides area specific harvest data for this section of the Trinity.	Given medium rank due to low percentage of sport fishing harvest compared to total harvest	Cost from three year action plan forwarded by ad-hoc group.
FH3-5		Increased smolt production will result in increased spawning escaptment and harvest opportunity of Trinity stocks.	Creel Survey - Angler harvest	Angler Harvest estimation Cedar Flat to Lewiston	Medium	$36,000	Provides area specific harvest data for this section of the Trinity. Harvest data is accounted for in the Willow Creek Weir harvest estimates.	Given medium rank due to low percentage of sport fishing harvest compared to total harvest	Cost from three year action plan forwarded by ad-hoc group.
FH3-6				Angler Harvest estimation Spring chinook - Klamath	Medium	$36,000	Provides area specific spring chinook harvest data for lower Klamath.	Given medium rank due to low percentage of sport fishing harvest compared to total harvest, hould pursue cost share with Klamath Program	Cost from three year action plan forwarded by ad-hoc group.
FH3-7	Increased salmonid habitat quantity and quality will result in increased smolt production.		Tribal harvest monitoring on lower Klamath River	Conduct Tribal harvest monitoring survey on lower Klamath River	High	$150,000	Provides harvest data for the Yurok Tribal fishery which is allocated 40% of all harvestable surplus.	Should pursue cost share with Klamath Program	Cost from three year action plan forwarded by ad-hoc group.
FH3-8				CWT marking at hatchery	High	$350,000	CWT marking of hatchery production necessary to partition hatchery and natural production as well as assess harvest impacts on Trinity stocks.		Cost was 465k in Three year action plan reflecting startup of constant fractional marking and purchase of new tagging machines. Reduce costs to 300 to 400k per G. Kautsky. Perhaps funding should come from hatchery operations?
FH3-9				Decode chinook tags recovered at hatchery	High	$13,000	Recovery of CWT necessary to partition hatchery and natural production as well as assess harvest impacts on Trintiy stoiks.		Cost from three year action plan forwarded by ad-hoc group. Perhaps funding should come from hatchery operations?
FH3-10			Hatchery tagging and recovery	Marking hatchery steelhead	High	$57,000	Marking hatchery steelhead provides managers with data necessary to assess status of the hatchery production program as well as the realative contribution of hatchery and natural steelhead production.		Cost from three year action plan forwarded by ad-hoc group. Perhaps funding should come from hatchery operations?
FH3-11				Marking hatchery coho salmon	High	$26,000	Marking hatchery coho provides managers with data necessary to assess status of the hatchery production program as well as the realative contribution of hatchery and natural coho production.		New task
FH3-12			Sport release mortality	Catch and release mortality estimation	Low	$72,000			Cost from three year action plan forwarded by ad-hoc group.
FH3-13			Age Composition	Conduct age composition analysis of scale data (total of 3 proposals for Fall Chinook)	High	$79,000	Due to the variable age at maturity for chinook salmon, age composition data is needed, along with spawning escapement and harvest data , to assess the brood year production.	Should pursue cost share with Klamath Program	Cost from three year action plan forwarded by ad-hoc group.

FH4-1			Monitor and compare adult escapement and subsequent emigrants (juveniles and smolts) from the upper 40 miles of Trinity River (at a point slightly upstream of the North Fork of the Trinity River) with a representative tributary and regional index watershed. Also monitor the entire basin if possible to separate contribution of upper/lower basin and provide physiological (growth?) information.	Tributary or reference river escapement and smolt production. Review regional data collection efforts, evaluate field monitoring sites, develop study plan, conduct peer review of study plan	**High**	**$30,000**	Need an index stream or array of streams to isolate natural fluctuations in adult escapement and smolt production from increases in production due to restoration efforts (is increase in production due to restoration efforts, or is it merely a regional increase that is due to another environmental factor not associated with restoration activities)	Quantified emigration estimates from mark/recapture. Emigration component crosscut with FP3, FP4, FH4	Cost could be potentially far less if existing estimation efforts from other basins/regions are used. Cost share with Klamath restoration to monitor Salmon River and/or Blue Creek? There are currently efforts that could these funds could be used to cost share with on the Salmon RIver, Blue Creek, Redwood Creek, and possibly the Rouge and Smith Rivers. Sampling strategy would need to be developed during one of the workshops.
FH4-2		Increased smolt production from upper 40 miles of Trinity River is a result of increased habitat quantity and quality	Trinity River spawner recruitment Lewiston to Cedar Flat	Carcass Surveys - Lewiston to Cedar Flat to estimate in-river spawning	**High**	**$30,000**	Quantification of recruitment to mainstem spawning in Lewiston to North Fork study area.		Cost saving by doing in conjunction with spawning surveys in FH5-1. Without spawning surveys, costs will be much higher (perhaps doubled or more)
FH4-3			Emigration estimation - Juvenile/Smolt production	Emigration estimation Lower Trinity. Measure response of restoration for the basin in smolt produciton.	**High**	**$150,000**	Monitoring of juvenile salmon and steelhead will provide information necessary to assess management actions (restoration of spawning and rearing habitat, thermal regimes). Monitoring this life stage is the last opportunity to collect data that can be used to evaluate fish population responses to restoration activities prior to the large influences of oceanic conditions and harvest that affect these populations. See FP4-1.	Must be statistically rigorous, must estimate trap efficiency, should include multiple traps to increase trap efficiency.	Task shared with FP4-1.
FH4-4				Emigration estimation above North Fork. Measure response of restoration directly below where most channel rehabilitation is expected to occur.	**High**	**$83,000**	Measure juvenile production directly below zone of concentrated restoration activity.	Must be statistically rigorous, must estimate trap efficiency, should include multiple traps to increase trap efficiency.	Assumes continuation of Junction City rotary trap or movement of this trap to location near North Fork
FH5-1	Restoration of alternate bar sequences and the spawning habitats that they provide will disperse the spawning activity throughout a greater area of the river.	Distribution of spawners locally is likely influenced restoration actions (gravel intro, channel migration, etc).	Quantify the spawning fish distribution, and timing and abundance.	Conduct spawning surveys from Lewiston Dam to mouth, using 1997 or 2001 orthorectified aerial photographs to map spawning locations (that can be used in GIS)	**High**	**$100,000**	Distribution of spawners locally influences colonization of restoration or study sites by salmonid fry and is likely influenced itself by restoration actions (gravel intro, channel migration, etc).	Identify/quantify superimposition. Some shared benefit with redd/carcass surveys funded through line above	cost of this project will depend on how much coordination there is with FH4-1. Currently, redd surveys combined with intensive carcass surveys from Lewiston to Cedar flat cost approximately 100K, but this could be reduced by coordination with FH3
FH6-1	Restoration of a functioning alluvial river will recreate and maintain pool habitats that provide adult spring chinook holding habitat.	Increasing pool depth and providing adequate water temperatures will increase spring chinook survival, increasing spring chinook smolt production	Identify and quantify adult spring chinook salmon holding locations, compare to water temperature monitoring data.	Snorkel surveys for spring chinook holding locations. Temperature investigation of holding pools.	**Medium**	**$0**	May assist in future real time flow management during summer, evaluate water temperature compliance point for spring-run	Adult snorkel surveys. Map locations. Measure temperature longitudinally and identify stratification if, when, and where it occurs.	Comments submitted on draft Adaptive Management Workshop summary spreadsheet suggest that this data may already exist from old Lewiston FWS days (per A. Hamilton).
FH7-1	Piggybacking dam releases on tributary floods will create and maintain complex channel morphology	Scouring redds during egg incubation will decrease smolt production from Trinity River.	Relate peak flow magnitude to redd scour depth and associated egg mortality to evaluate potential impacts of piggybacking dam releases on tributary floods.	Redd scour investigation - scour chains	**High**	**$60,000**	Could be more efficient use of water provided that no unreasonable cohort loss occurs as a result of piggybacking. Very little data available on relating discharge to redd scour (Wilcock et al, 1995 is only one)	Tied to geomorph. Redd scour investigations	Could be deferred another year due to no high flows expected in FY 2002