

	1. Planned or Ongoing Actions/Issues	2. Decision needed	3. Current information (Draft, RM&E will revise)	4. Information Gap (Draft, RM&E will revise)	Fy19 concept paper notes
North Santiam					
1	Interim operation of Detroit Dam for temperature targets	Determine temperature targets for operation of Detroit Dam BEFORE wild fish are reintroduced above the dam	River temperatures, Chinook PSM, adult Chinook and summer steelhead pHOS and collection rates at Minto available for several years prior to 2017. New temperature targets were implemented in 2017 with a goal of providing cooler temperatures to reduce PSM. Previous data documents that 1) PSM can be high in hot summers; 2) cool temperatures slow or stop adult Chinook upstream migration. Migration delays could increase PSM if adults hold in high densities in the lower river below Minto AFF. pHOS could increase if upstream migration results in fewer adult collected at Minto AFF.	Changes in river temperatures, Chinook PSM, Chinook and steelhead pHOS, and collection rates at Minto with the 2017 targets implemented compared to pre-2017	USACE Revise APH-18-03 if needed
2	Operation of temperature control tower	Determine temperature targets for operation of Detroit Dam AFTER wild fish are reintroduced above the dam	NOT needed in FY19	NOT needed in FY19	NA
3	Interim actions to manage TDG before fish passage improved at Detroit Dam	What alternatives can be used to effectively manage TDG below Big Cliff Dam? What standard(s) should be applied to compare the alternatives? Should structural	Multiple years of TDG data below Big Cliff one mile below at Niagara and downstream of Minto Dam, as summarized in Corps annual water quality reports and by USGS online. High TDG events (>120% saturation) occurring frequently and can last several days. Foster TDG study would indicate that the surface levels of TDG we see at Niagara would result in	Summary of available information on TDG, Chinook habitat availability below Big Cliff and Minto dams. Evaluation of operational alternatives to reduce TDG. Present summary to managers to determine if sufficient to support management decisions. If	USACE Revise FMWQ-18-04-SYS if needed

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		improvements be made considering plans to bypass fish around the Minto to Big Cliff reach once downstream passage is improved?	depth-compensated TDG in the gravels that could harm redds. Spawning and rearing habitat capacity estimates are available for this reach, as well as above Detroit and below Minto dams. Spawning surveys of Chinook have been completed in at least 2 years, but survey quality/comparability was limited by hydraulic conditions.	not clarify information gaps and update this table and concept FMWQ-18-04-SYS	
4	Manage TDG AFTER fish passage improved at Detroit Dam	Determine if action should be taken to reduce TDG after fish passage is improved at DET Dam. Consider if fish will be placed into the reach between Minto and BC dams, and consider if TDG should be reduced during the conservation season, flood season, or both.	NOT needed in FY19	NOT needed in FY19	NA

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5	Release of adult wild fish in the North Santiam BEFORE fish passage is improved at Detroit Dam	Where and how many wild fish collected at Minto AFF should be released in each reach to maximize productivity potential?	Chinook adults collected at Minto, and outplanted, since 2002. Chinook spawner abundance and PSM below Minto Dam since 2002, and above Minto Dam since 2012. Spawning surveys above Minto Dam were limited by hydraulic conditions (high velocity and depths), impacting the quality/comparability of the surveys. Spawner effectiveness and CRR for brood years 2009 and 2010 for the full cohort. Current habitat capacity above and below dams. Historic and recent hydrology and dam operations; including surface spill patterns and downstream water temperatures. Downstream fish passage efficiency through existing routes.	Comprehensive evaluation of production (actual and potential) below Minto, above Minto, and above Detroit using existing data, considering habitat conditions, fish passage and temperature conditions, production and other information. Use this evaluation to 1) support decisions on outplanting before DET passage is improved, and 2) to determine critical uncertainties to refine interim passage management.	NMFS ODFW prepare new concept
6	Reintroduce wild spring Chinook salmon above Detroit Dam AFTER fish passage is improved	When, where, and how (and how many) wild and hatchery fish are to be released above Detroit dam as fish passage conditions are improved? What metrics and criteria will be used to determine status and inform reintroduction actions?	Chinook adults collected at Minto, and outplanted, since 2002. Chinook spawner abundance and PSM below Minto Dam since 2002, and above Minto Dam since 2012. Spawning surveys above Minto Dam were limited by hydraulic conditions (high velocity and depths), impacting the quality/comparability of the surveys. Spawner effectiveness and CRR for brood years 2009 and 2010 for the full cohort. Current habitat capacity above and below dams.	This will be refined with input RM&E team and the Reintroduction Plan as developed. Potential data types: adult return abundance, spawning surveys, genetic pedigree, PSM.	

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7	Evaluate post-effectiveness of Minto AFF for adult Chinook and steelhead	Since completion in 2012, is the Minto AFF performing adequately? What standard(s) will be applied to determine adequacy of AFF performance? (collection efficiency? PSM?)	<p>Estimated number of adult Chinook and steelhead passing Bennett Dam and subsequently collected at Minto Dam, 2012 to 2017. Chinook spawner abundance and pHOS below Minto Dam, 2012 to 2015. Steelhead spawner abundance, 2016 and some previous years.</p> <p>Existing data does not indicate issues with collection efficiency or adult survival (PSM is consistently low since 2012 for adult spring Chinook released above Detroit).</p>	<p>Evaluation of Minto AFF collection efficiency of adult Chinook salmon, summer steelhead, and winter steelhead since new trap operations began in 2012. Evaluation of adult Chinook PSM after collection at Minto AFF and outplanted since 2012.</p> <p>RM&E doesn't recommend additional work at this time.</p>	RM&E Team doesn't recommend a concept paper be developed at this time
8	Downstream fish passage design - conveyance method to below dam	What downstream fish passage conveyance methods should be designed to meet performance criteria - trap and haul, piped-bypass, other?	<p>Regional information on survival and injury rates of different fish species and size classes is available for a range of juvenile passage conveyance methods, however very little information is available for high head dams.</p> <p>Recent information is available on survival of juvenile salmonids in a bypass pipe at a high head dam (Green Peter). This information may support drafting design criteria.</p> <p>New information suggesting copepod infections in Willamette reservoirs may result in poor survival of fish collected and hauled downstream.</p>	<p>Design criteria for design of a high head bypass system (High-head bypass PDT drafting?).</p> <p>Stress and mortality rates of juvenile Chinook infected with copepods experiencing different downstream fish passage conveyance methods.</p> <p>Methods to reduce disease or other forms of stress experienced prior to collection and downstream passage conveyance (including copepod infections).</p> <p>[DOES COPEPOD CONCEPT COVER THIS?]</p>	Review revised copepod concept paper and determine if this info need is addressed

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South Santiam					
1	Foster Dam Downstream fish passage - post-effectiveness performance	Determine if the new weir is performing adequately. If not identify alternatives to address deficiencies in performance. What standards will be used to evaluate adequacy? (Improvement over baseline juvenile passage conditions? replacement? changes to water quality conditions below Foster? changes collection efficiency of adult Chinook and steelhead?)	Data available for baseline conditions include: - Passage efficiency and passage survival of juvenile Chinook and steelhead. - TDG and water temperatures. - Numbers of adult Chinook and steelhead collected seasonally; and collection efficiency of adult Chinook.	Estimates of downstream fish passage performance at Foster Dam, and TDG levels below Foster Dam, with the new fish weir in operation. How well is the new weir performing? Is operation of the new weir changing water quality conditions below Foster or effecting collection of adults at Foster AFF?	

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2	Upstream fish passage at Foster Dam	Determine if changes are needed to increase collection efficiency of adult Chinook, reduce PHOS below Foster Dam, and manage PSM at levels for transported adults.	Collection efficiency estimated in 2017 at about 50% for adult Chinook. Previous years of U of I studies indicate the facility is not working well; a lot of fish milling below dam, entering and exiting different portions of ladder but not making it into the trap. Weir opening treatments appear to have little effect. Temperature appears likely to be the cause, as spillway temperatures are much warmer than water in the ladder (from Foster AWS). May also relate to chemical cues for homing adults from South Santiam above Foster; water chemistry samples from previous years have been lost. Hatchery effluent into the opposite bank of the tailrace may attract HOR adult.	Assess adult Chinook collection efficiency with operation of ladder with warmer water (e.g. by changing releases from upstream Green Peter Dam). If changing temperatures in ladder are found not adequate, then evaluate use of South Santiam water in ladder to improve attraction into ladder and/or hatchery operations to reduce false attraction of hatchery origin adults to nearby hatchery discharge.	
3	Complete reintroduction of wild spring Chinook salmon above Foster Dam	Determine if reintroduction actions taken have adequately met goals and objectives. Need to define how adequacy will be determined.	[NOTE: once reintroduction goals and objectives established, update this section to summarize what information is available to evaluate adequacy of reintroduction actions taken] Most recent update of cohort data shows low CRR (0.06-0.07), however previous years showed CRR>1. Findings support a 2010 brood failure associated with a washout event. 2018 is the year we would expect most of the cohort (4-year olds) to return since the new Foster AFF came online (2014), and 2019 is when the first full cohort from adults passed through the new facility would be available. We know the AFF isn't attracting as many adults as we would like, but we don't know if the adults	Complete reintroduction plan identifying goals, objectives and schedule. [NOTE: once reintroduction goals and objectives established, update this section to explain what information gaps need to be addressed to evaluate if reintroduction actions have achieved goals and objectives] Rate at which local adaptation is occurring? What is CRR after Foster AFF started operating? Was the 2010 brood failure a one-off event, or has CRR continued to decline? Note: need to preserve sample data; analyze genetic samples so data aren't lost	

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			handled in the new facility have ultimately been more or less successful.		
4	Complete reintroduction of wild winter steelhead above Foster Dam	Determine if reintroduction actions taken have adequately met goals and objectives. Need to define how adequacy will be determined.	[NOTE: once reintroduction goals and objectives established, update this section to summarize what information is available to evaluate adequacy of reintroduction actions taken]	Complete reintroduction plan identifying goals, objectives and schedule. [NOTE: once reintroduction goals and objectives established, update this section to explain what information gaps need to be addressed to evaluate if reintroduction actions have achieved goals and objectives]	
5	Downstream fish passage in Green Peter Reservoir and at Green Peter Dam [Note: this policy issue is currently unresolved, however, in anticipation of it being resolved it is	Determine the feasibility of providing adequate DOWNSTREAM passage at Green Peter Dam. What metrics will be used to evaluate feasibility?	[Update this section once it is determined how feasibility will be evaluated]	[Update this section once it is determined how feasibility will be evaluated]	

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	appropriate to keep a placeholder for the needed study]				
6	Upstream adult fish passage at Green Peter Dam [Note: this policy issue is currently unresolved, however, in anticipation of it being resolved it is appropriate to keep a placeholder for the needed study]	Determine the feasibility of providing adequate UPSTREAM passage at Green Peter Dam. What metrics will be used to evaluate feasibility?	[Update this section once it is determined how feasibility will be evaluated]	[Update this section once it is determined how feasibility will be evaluated]	

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7	Reintroduce spring Chinook salmon above Green Peter Dam [Note: this policy issue is currently unresolved, however, in anticipation of it being resolved it is appropriate to keep a placeholder for the needed study]	Determine if reintroduction actions taken have adequately met goals and objectives. Need to define how adequacy will be determined.	[NOTE: once reintroduction goals and objectives established, update this section to summarize what information is available to evaluate adequacy of reintroduction actions taken] Recent habitat capacity information available from NWFSC. Juvenile emigration timing information is available from other neighboring Chinook populations above Willamette Reservoirs, but no local recent data on juvenile migration size and timing into Green Peter reservoir. Previous adult ladder had poor adult attraction due to cool water temperature discharges from GP Dam.	Complete reintroduction plan identifying goals, objectives and schedule. [NOTE: once reintroduction goals and objectives established, update this section to explain what information gaps need to be addressed to evaluate if reintroduction actions have achieved goals and objectives] PSM, spawning distribution, abundance for adult Chinook salmon and steelhead released above Green Peter Dam. Seasonal and diel distribution for juvenile Chinook salmon and steelhead entering Green Peter Reservoir in the following size classes: <50 mm FL, 50-90 mm FL, and >90 mm FL. Annual abundance of juvenile salmon (and steelhead, if feasible) at the head-of-reservoir sampling locations	
8	Complete reintroduction of wild winter steelhead above Green Peter Dam [Note: this policy issue is currently unresolved, however, in anticipation of it being resolved it is appropriate to	Determine if reintroduction actions taken have adequately met goals and objectives. Need to define how adequacy will be determined.	[NOTE: once reintroduction goals and objectives established, update this section to summarize what information is available to evaluate adequacy of reintroduction actions taken]	Complete reintroduction plan identifying goals, objectives and schedule. [NOTE: once reintroduction goals and objectives established, update this section to explain what information gaps need to be addressed to evaluate if reintroduction actions have achieved goals and objectives]	

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9	Remove or modify revetments	See systemwide table			

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McKenzie					
1	Cougar Dam downstream fish passage design - conveyance method to below dam	What downstream fish passage conveyance methods should be designed to meet performance criteria - trap and haul, piped-bypass, other?	<p>Performance criteria: 95% collection efficiency from cul de sac; 98% survival from point of entrance to collection (see CGR performance criteria document for full definitions).</p> <p>Index of infection intensity and prevalence in juvenile salmonids in Cougar Reservoir, upstream and downstream (multiple recent years). Infection rates higher in reservoirs than in streams, increase seasonally between spring and fall, and occurs most often in brachial cavity in reservoirs, vs. fins in streams. Lab study suggest swimming ability and survival rates reduced for infected fish. Information suggests copepod infections in Willamette reservoirs may result in poor survival of fish collected and hauled downstream.</p> <p>Regional information on survival and injury rates of different fish species and size classes is available for a range of juvenile passage conveyance methods, however very little information is available for high head dams.</p> <p>Recent information is available on survival of juvenile salmonids in a bypass pipe at a high head</p>	<p>Which passage conveyance method (volitional or trap and haul) best supports achieving performance criteria?</p> <p>What design or operational changes can be made to reduced associated stress and mortality in juvenile Chinook salmon passing downstream at Cougar Dam?</p> <p>To what extent does copepod infections increase risk or mortality for juvenile Chinook passing downstream at Cougar Dam?</p> <p>Can copepod infections be reduced in juvenile Chinook salmon in Cougar Reservoir (e.g. by reducing reservoir residence time)?</p>	

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			<p>dam (Green Peter). This information may support drafting design criteria.</p> <p>Multiple years of juvenile Chinook passage timing entering and existing reservoir. Currently FSS design can be operated year-round; maintenance period planned for mid-summer period.</p>		
2	Rearing habitat for juvenile Chinook salmon	Determine where rearing habitat is limited above or below Cougar Dam, and specific actions to address.	[insert summary of available information]	<p>Is rearing habitat limitations below Cougar and in the mainstem McKenzie River causing decline in adult production?</p> <p>Does more/higher quality rearing habitat above Cougar decrease reservoir residence time or affect outmigration timing/size of juveniles?</p> <p>Do changes in juvenile outmigration timing/size and reservoir residence time result in reduced copepod loads or mortality of infected juveniles?</p>	

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3	Complete reintroduction of wild spring Chinook salmon above Cougar Dam	Determine if reintroduction actions taken have adequately met goals and objectives. Need to define how adequacy will be determined.	<p>[NOTE: once reintroduction goals and objectives established, update this section to summarize what information is available to evaluate adequacy of reintroduction actions taken]</p> <p>Pedigree information on adult Chinook returns to Cougar AFF across multiple years and recycling protocols completed.</p> <p>CRR for fish outplanted above the dam is <0.4 Cougar downstream passage is scheduled to begin in 2019 (plans and specs), break ground in 2020, and be completed by 2023.</p> <p>Jim Myer's reintroduction planning report indicates one method could be to transport fish above the dam in higher densities, and potentially of different sources, in years immediately prior to passage. Note: number of fish outplanted will need to be adjusted in drawdown years for construction.</p>	<p>Complete reintroduction plan identifying goals, objectives and schedule. [NOTE: once reintroduction goals and objectives established, update this section to summarize what information is available to evaluate adequacy of reintroduction actions taken]</p> <p>Rate at which local adaptation is occurring? Are natural origin adults from below Cougar Dam being mined for above-dam outplants with current recycling protocol? Is there a break or range in timing of adult returns from above versus below the dam? (update to prior information) How many fish should be outplanted above Cougar to seed habitat before passage in place, and how many immediately after passage in place? Note: need to preserve sample data; analyze genetic samples so data aren't lost</p>	
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