NON-FLOW CONSERVATION FUND

1. PROGRAM NEED & GOALS

Program Need

Adoption of bypass flows under the HCP minimizes and avoids many of the existing sources of potential incidental take related to City activities. Nevertheless, some residual effects to Covered Species remain after implementation of bypass flows. The Non-Flow Conservation Fund (NFCF) will provide funding for restoration and enhancement projects that will compensate for the residual effects of Covered Activities. This section describes the following critical components of the NFCF:

- roles and responsibilities for the City and the HCP permitting agencies;
- the linkage between modeled residual impacts from HCP implementation and benefits provided by mitigation projects funded under the NFCF;
- program development and rationale; and
- funding allocation plan to assure that the NFCF is viable and effective.

Program Goals

The goal of the NFCF is to mitigate for modeled residual impacts that result from on-going water supply operations outlined in the Plan. The specific biological goals for the NFCF are detailed in Chapter 4 of the Plan. In addition to addressing this goal, the program has been designed to:

- engender collaboration between the City and the agencies to address new conservation issues and opportunities as they arise – maximizing the impact of funds from the NFCF;
- enable the City to work with the agencies to identify and implement projects that directly address residual impacts to Covered Species, and also provide benefits to species habitat more generally and result in more resilient watersheds.
- create a program that balances administrative oversight and procedures for accountability with flexibility so that funding can be directed to projects that will provide the greatest conservation benefit.

2. PROGRAM OVERSIGHT & DECISION-MAKING

While implementation of the NFCF will require a collaboration between the City and the agencies, the City will be responsible for implementing the program. The NFCF will be managed by the HCP Administrator.

The City will work with NMFS, CDFW, and an array of local partners to develop a working list of potential NFCF projects. The City will propose projects from this list for approval by NMFS and DFW. The City, NMFS, and DFW will form a Technical Advisory Committee (TAC) to collaboratively develop the working NFCF project list, to review project concepts, and to provide design-level review of selected projects at key milestones (e.g. conceptual designs, 60% designs, etc.) during the planning process. Suggested projects can come from the agencies and others, including through a call for proposals. After review of potential project opportunities, the City will propose a project or suite of projects to NMFS and DFW members of the TAC for approval. Projects that cannot garner support from both agencies will not be funded.

The TAC will use the following metrics to assess a given project for funding:

- Does the project have the potential to benefit coho recovery as well as steelhead recovery?
- Does the project address a known residual impact resulting from implementation of the HCP?
- Does the project address a known limiting factor (as articulated in the CCC Coho Recovery Plan or CCC Steelhead Recovery Plan) for the covered species?
- Does the project enhance watershed conditions that lead to ecological resilience and healthy aquatic environments?
- Does the project have landowner support and stakeholder support necessary to ensure implementation?
- Are there any known constraints (stakeholders, technical, etc.) that are likely to significantly impede the ability of this project to be completed?
- Do the costs, in terms of financial commitment from the NFCF, and benefits to covered species compare favorably to other potential project opportunities?
- Is the estimated timeline for design, permit and construction within a 1-3 year window based on expected complexity of the project?

Potential projects will be evaluated over a planning cycle of 5 years. The 5-year project list can be revisited, as needed, during the planning cycle to address changed conditions or new opportunities. The number of projects selected for funding through the NFCF will vary for each 5-year planning cycle based on the size and complexity of projects. It is expected that most projects funded through the NFCF will require a 1-3 year project timeline from initial planning to construction. Annual spending on design, permit and implementation is expected to average approximately $275,000 per year (in 2018 dollars) within each 5-yr planning cycle over the 30-year lifetime of the HCP. The City may also, at its discretion, choose to allocate the total funding for the program either equally throughout the 30-year permit term or front load funding in the early years of the Plan.

3. QUANTIFYING & LINKING IMPACTS AND BENEFITS

Ideally, impacts can be translated into a transparent, meaningful, and accurate common spatial metric such as acres, linear feet, etc. to enable translation into adequate mitigation. Creating this common variable for this process is particularly complex in light of the fact that the residual impacts identified through the Plan utilizes comparative metrics or metrics of "change" versus specific spatial metrics. While the comparative metric approach makes sense for understanding the relative effects of the City's water diversions and operations, it does not enable simple translation to an absolute quantity of residual impact. Moreover, the temporal nature of the impacts (e.g. they may only appear in certain water years and may only affect a specific life history stage) further complicates the calculus of developing an absolute (vs relative) spatial metric. Without a clear precedent in the literature or template for translating these impacts into a common spatial metric, the "Ecological Portfolio Method" was developed to translate residual impacts into a hybrid quantitative-qualitative mitigation metric (ecological portfolio) and then into a purely quantitative mitigation metric (dollars).

One of the most critical tasks for development of the NFCF has been creating a clear and direct link between the potential project types that could be funded and the specific residual impacts identified through the HCP. Table 1 displays this linkage by providing both a summary of the modeled residual impacts and a linked ecological portfolio of potential NFCF projects that would directly off-set these impacts. It is important to note that while the residual impacts are generally limited to a specific life history stage and/or water year type, many of the potential projects that would be implemented through the NFCF provide benefits across life history and water year types. An example of this might be placement of large woody debris (LWD) structures to offset impacts to rearing in dry years. While these structures will provide deeper pools and pool tail-outs, which will increase summer rearing opportunities, if designed correctly they can also provide high flow refuge during wet winters and improve spawning opportunities through better substrate sorting.

Table 1 provides a clear linkage between residual impacts and potential mitigation projects presented through the ecological portfolios. Table 1 also associates each of the potential portfolio projects with an estimated cost in 2018 dollars. Based on this two phase process of linking impacts to projects in a portfolio and developing costs for projects in the portfolio, the level of funding required for the NFCF can be quantified.

Table 1. NFCF Linkage between Residual Impacts and Ecological Portfolios

	Residual Effect after Avoidance and Minimization →			Possible Ecological Portfolios to Mitigate Residual Impacts (1)		
Reach	*Steelhead*	*Coho Salmon (2)*	*Areal Extent*	*Action*	*Unit*	*Estimated Cost*
Laguna Anadromous	Small decrease in habitat suitability index (WUA) for spawning in normal (6% reduction) and wet (6% reduction) years	NA	1.4 mile anadromous reach with estimated 180 ft2 of spawning gravel (2 sf /100 ft of stream)(ENTRIX 2004)	Expand lower floodplain by 0.5 acres and complete Riparian corridor restoration along ~1.8 acres of SP property	2.3	$ 555,036
				Remove defunct bridge, abutments, and restore slope on Coast Rd (cost equivalent to small dam removal)	1	$ 151,650
	Moderate reduction in the habitat suitability index (WUA) for rearing by 16% in wet years and 6% in normal years	NA	1.4 mile anadromous reach	Install 14 anchored LWD structures in lower 3/4 miles (~ every 200 ft)	14	$ 257,497
Liddell Anadromous	Decrease in number of days with suitable conditions for adult migration in normal (9% reduction to 86 days), dry (42% reduction to 23 days) and critical dry years (31% reduction to 9 days)	NA	1.2 mile anadromous reach	<u>San Vicente Creek as a proxy for Liddell and Majors</u>		
	Decrease in WUA for spawning in normal (10% reduction), dry (31% reduction) and critical dry years (38% reduction)	NA	1.2 mile anadromous reach with estimated 716 square feet of spawning gravel (11 sf/100 ft of stream)			
	Decrease in WUA for rearing in wet (20% reduction), normal (23% reduction), dry (40% reduction) and critical dry years (44% reduction)	NA	1.2 mile anadromous reach	Cost share with County of Santa Cruz Sanitation District and others in the effort to develop a new, more sustainable water source for Davenport, which would improve instream flows for Covered Species.	lump sum	$ 500,000
	Decrease in number of days with suitable conditions for smolt migration in normal (6% reduction to 141 days), dry (35% reduction to 99 days) and critical dry years (57% reduction to 61 days)	NA	1.2 mile anadromous reach	Remove or modify 2 Mill Creek dams for fish passage and develop a new back-up intake for Davenport that enables fish passage to ~0.5 mile of srream and add 10 unanchored LWD structure in Mill Cr to improve rearing and spawning.	2 & 10	$ 587,883
Majors Anadromous	Decrease in WUA for spawning in normal (5% reduction), dry (23% reduction) and critical dry years (17% reduction)	NA	0.7 mile anadromous reach with estimated 49 square feet of spawning gravel (1.3 sf/100 ft of stream)	Restore downstream floodplain/backwater, remove historic spoils, and reconnect to mainstem (~1 acre) to improve rearing conditions for both species.	1	$ 895,695
	Decrease in WUA for rearing in all year types (20% to 24% reduction)	NA	0.7 mile anadromous reach	Cost-Share continue Cape Ivy and Clematis eradication efforts for 5 years to reduce overall potential impacts to riparian corridor, shade, and future LWD recruitment.	lump sum	$ 250,000
	Decrease in number of days with suitable conditions for smolt migration by 3 days in dry years (12% reduction) and 1 day in critical dry years (11% reduction)	NA	0.7 mile anadromous reach			

San Lorenzo below Tait St (3)	Decrease in WUA for rearing in wet (9% reduction), normal (15% reduction), dry (16% reduction) and critical dry years (15% reduction)	NA	Up to 1.4 miles of riverine habitat, including 0.9 miles of flood control channel, depending on lagoon stage, and up to 1.5 miles of lagoon habitat		Create shade, scour and refugia for rearing in lagoon/tidal areas downstream of Laurel Street through installation of 10 dynamic anchored LWD clusters	10	$ 390,237
	Decrease in number of days with suitable conditions for adult migration in dry (8% reduction to 133 days) and critical dry years (28% reduction to 105 days)	Decrease in number of days with suitable conditions for adult migration in normal (11% reduction to 55 days), dry (20% reduction to 47 days) and critical dry years (32% reduction to 40 days)	Access to 25.8 miles of anadromous steelhead habitat in the mainstem and substantial additional miles in tributaries; up to 6 miles in the mainstem for coho and 20.8 in tributaries		Install 20 "notched" rock weirs, anchored LWD and/or off-set wood or rock structures to focus low flows, and improve conditions for resting and rearing, along ~1 mile between Tait Street and Water Street	20	$ 1,202,941
	Decrease in number of days with suitable conditions for smolt migration in critical dry years (28% reduction to 105 days)	Decrease in number of days with suitable conditions for smolt migration in critical dry years (28% reduction to 105 days)			Remove or modify 2 mainstem SLR dams (Lewis & Barker) plus 1 tributary dam to improve movement throughout the system during dry years.	3	$ 682,425
San Lorenzo below Felton (4)	Flow reductions during early rearing period (April, May) in dry years (7.5% reduction)	Flow reductions during early rearing period (April, May) in dry years (7.5% reduction)	Up to 7 miles of riverine habitat down to Tait Street could be affected in dry years		Work with partners to identify, design, and implement 5 permanent instream flow improvement projects on the middle reach of the San Lorenzo River to increase instream flows during April, May and into the summer to improve rearing.	5	500,000
Newell Anadromous (5)	Decrease in number of days with suitable conditions for adult migration in normal (15% reduction to 37 days), dry (44% reduction to 9 days) and critical dry years (76% reduction to 1 day)	Decrease in number of days with suitable conditions for adult migration in wet (21% reduction to 24 days), normal (38% reduction to 14 days), dry (52% reduction to 1 day) and critical dry years (67% reduction to 0 days)	About 1 mile of anadromous habitat		<u>Branciforte Creek as a Proxy for Newell Cr</u> Remove Casa de Montgomery dams and develop a fish friendly replacement diversion to open up passage to 4-5 miles of anadrmous stream.	2	$ 606,600
	Decrease in WUA for spawning in normal (9% reduction), dry (21% reduction) and critical dry years (34% reduction)	Decrease in WUA for spawning in dry (20% reduction) and critical dry years (42% reduction)	Total of 21 potential spawning locations with maximum 1095 square feet of useable habitat (24 sf/100 ft. of stream)		Install 12 anchored LWD structures at appropriate locations to improve spawning gravel sorting and increase square footage of spawning by ~100 sf per site (1200 sf in total)	12	$ 220,712
					Remove 4 additional high and medium priority passage obstructions (all small) along Branciforte Cr to enable unimpeded passage	4	$ 210,804
	Decrease in number of days with suitable conditions for smolt migration in normal (13% reduction to 42 days), dry (35% reduction to days to 14 days) and critical dry years (80% reduction to 1 day)	Decrease in number of days with suitable conditions for smolt migration in normal (13% reduction to 42 days), dry (35% reduction to days to 14 days) and	About 1 mile of anadromous habitat		Cost-share planning and implementation of passage improvement on upper 1/3 of Flood Control Channel to enable access across a range of migration flows through the channel	flat fee	$ 1,000,000
						TOTAL	*$ 8,011,479*

(1) Ecological Portoflios are designed as concepts and are <u>not meant to be interpreted as perscriptive</u>, NFCF projects will be determined by the TAC based on opportunities available and perceived benefits in real time
(2) No residual effects on coho in Laguna Creek of 5% or more; no suitable habitat for coho in Liddell and Majors Creeks; no suitable rearing habitat for coho downstream of Tait St.

(3) Reductions in adult and smolt migration opportunities at this location may not translate into significant biological effects since there is still a substantial period when migration criteria are still met
(4) Spawning and rearing values below Felton based on hydrology only
(5) All residual effects largely determined by spill frequency

4. DEVELOPING THE PROCESSES AND DATA TO SUPPORT THE NFCF

Figure 1 describes the 5 step process utilized to develop the NFCF, which starts with identifying residual impacts and culminates with a translation of appropriate mitigation into a quantitative metric – dollars. Appendix A provides a series of tables that were used to support development of the NFCF. The two critical components that provide the foundation for the NFCF are the development of the ecological portfolios and the translation of the portfolios into dollars.

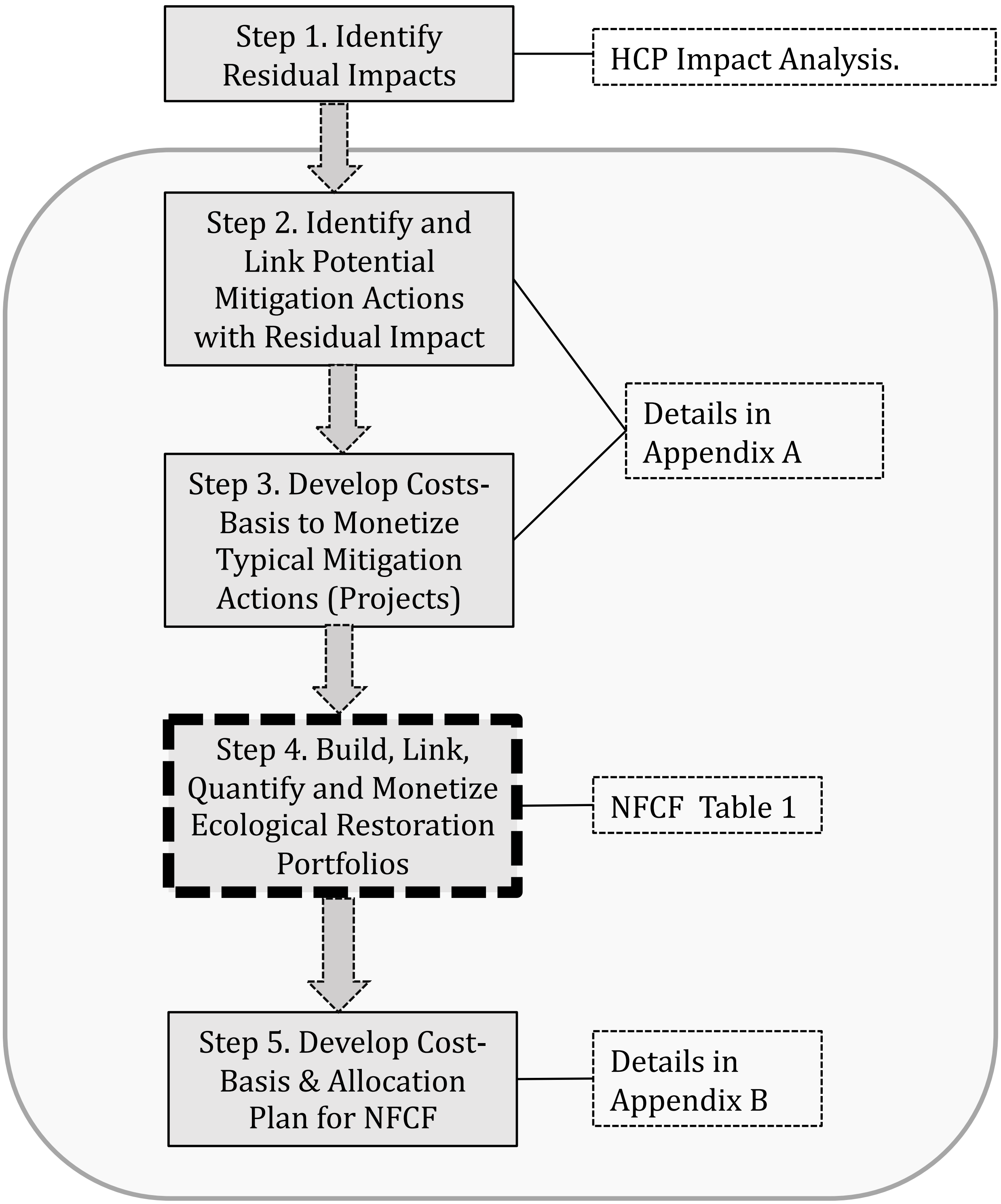
Developing Ecological Portfolios

Creating the portfolio requires identification of a suite of projects or actions that would directly mitigate for potential residual impacts. It is critical to emphasize that these portfolios were designed to enable a realistic quantification and monetization of mitigation costs and they were <u>not</u> designed to be prescriptive as to exactly what mitigation should be implemented with the NFCF funding. While the projects within each portfolio have been identified based on the residual impacts, local conditions, and known limiting factors, they do not take into consideration a number of critical externalities (e.g. flood management, access, ownership, recovery priority, etc.) that could affect the ability or the desire to implement a given project. Moreover, the portfolios were developed using a combination of quantitative tools (e.g. relative size or location of the residual impacts) and qualitative tools. The qualitative tools are based on known site conditions, opportunities for meaningful improvement of conditions for fisheries, and professional judgement. While most of the portfolios are focused on directly mitigating residual impacts in the impacted reaches, for Newell Creek the mitigation would occur in Branciforte Creek, and for Liddell Creek and Majors Creek, the mitigation would occur in San Vicente Creek. These particular streams were used as proxies for the impacted reaches because (a) the level of potential residual impact resulting from implementation of the HCP in Newell Creek makes it a more difficult stream for implementing meaningful mitigation actions and (b) higher priority recovery streams exist in nearby watersheds that may provide greater mitigation opportunities and benefits for both coho and steelhead. The replacement portfolio streams either currently support steelhead and coho (San Vicente Creek) or support steelhead and are a priority for coho recovery (Branciforte Creek).

Translating Ecological Portfolios into Dollars

Development of locally appropriate costs for implementing the ecological portfolios is a critical step for monetizing each portfolio in 2018 dollars. While there are a number of sources in the literature that provide ranges of costs for an array of restoration practices, this effort focused on using locally and regionally available data from 15 years of the Integrated Watershed Restoration Program

Figure 1. Flowchart for Quantifying and Monetizing Impacts and Mitigation through the Ecological Restoration Portfolio Approach



(IWRP). Finally, in situations where IWRP data was not available, the database has been completed with additional data compiled through (a) personal communication with local experts; (b) professional experience; and (c) consulting and cross-referencing with NOAA's 2008 Technical Memorandum *Habitat Restoration Cost References for Salmon Recovery Planning* by Thomson and Pinkerton. Appendix A contains tables with known costs and an average cost-basis for a suite of restoration actions that could be implemented as part of the NCFC.

Once the ecological portfolios have been completed and this hybrid quantitative-qualitative metric has been translated into dollars, the final step is to develop a cost allocation plan for implementation of the NFCF. The costs allocation plan is a 30-year budget for the NFCF that is divided into six 5-year planning cycles with associated work plans. The allocation is further divided into annual expenditures. The cost allocation plan is presented in 2018 dollars and provides a snap-shot of annual funding as well as a realistic view of what can be accomplished with the NFCF funding currently recommended. The cost allocation is included in Appendix B and Chapter 7 (table 7.2) of the HCP.

Appendix A

Appendix A: Table A-1. Restoration Action Linked to Residual Impact/Benefit

NFCF Example Project Types	Steelhead				Coho				Water Year Type				Comments
	Adult migration	Spawning/incubation	Rearing	Smolt migration	Adult migration	Spawning/incubation	Rearing	Smolt migration	Wet	Normal	Dry	Critically Dry	
Large Woody Debris (unanchored)	x	X	X	x	x	X	X	x	X	X	X	X	LWD forcing pool creation and sediment sorting will directly address impacts to spawning and rearing across all years, but will also provide high flow regufia for migrating adults, juveniles and smolts.In critically dry years, LWD forced pools maybe the only dry season refugia available.
Large Woody Debris (anchored)	x	X	X	x	x	X	X	x	X	X	X	X	See above
Dam or Obstruction Removal	X	x	x	x	X	x	x	x	X	X	X	X	Removal of obstruction will focus on enabling all life stages of fish to move upstream to find spawning or rearing habitat or downstream to find rearing habitat and smoltify during a range of water years and flows.
Dam or Obstruction Modification	X	x	x	x	X	x	x	x	X	X	X	X	See above
Culvert Removal (include replacement w/bridge)	X	X	x	x	X	X	x	x	X	X	X	X	In addition to enabling passage of all life stages (especially adults), culvert removals will should enable natural sediment transport improving LWD and spawning as well as reducing chronic erosion from undersized and/or perched culverts. Reduced chronic erosion should improve localized spawning success and rearing success.
Culvert or Flood Channel Retrofit /Upgrade	X	X	x	x	X	X	x	x	X	X	X	X	See above
Creation/Enhancement of Alcoves	x		x	x	x		X	x	X	X	X	x	Alcoves provide critical rearing habitat for coho as well as rearing for steelhead. They also can address residual impacts to migration by providing high water refugia for adults and outmigrants.
Reconnection of Floodplains	x		X	x	x		X	x	X	X	x		Major benefit will be for rearing coho and steelhead, if projects are able to sustain duration of inundation to allow food production. Floodplains will provide high flow refugia, which is a limiting factor in many of the SC watersheds. While floodplain benefits accrue with inudation and benefits increase with flows. Indirect benefits can also include groundwater recharge and elevated downstream baseflows.
Lagoon enhancements	x		X	X	x		x	X	X	X	X	X	Mechanical breaching, engineering solutions to improve timing and duration of breaching, and enhancements to provide cover will benefit adults, rearing steelhead, possibly rearing coho, and smolt outmigration.
Riparian easement w/restoration	x	X	X	x	x	X	X	x	x	X	X	X	Increase food input through litterfall, reduced erosion through vegetated roughness and reduce solar input will benefit rearing through food and temperature control, incubation via sediment reduction) and long-term benefit across life history stage for natural LWD recruitment.
Bio-Engineered bank stabilization	x	X	X	x	x	X	X	x	X	X	x	x	Reducing fine sediment loading will benefit spawning/incubation and rearing through predation effeciency with lowered turbidty. If engineered with refugia in-mind, these projects can also provide high flow and dry season refugia.
Gravel augementation		X	X			X	x						Gravel augmentation is critical in systems with modified transport regimes and will not only improve spawning and incubation success, but will support riffle feeding for juvenile steelhead and to a lesser degree feeding by juvenile coho.

Road Decomissioning	x	**X**	x	x	x	**X**	x	x					Reduced sediment loading will improve spawning/inubation success through reduced embeddedness of gravels and maintaining oxygenation. Additional benefit is derived from reduced loading of fine sediment, which can affect feeding efficiency and health of migrating adults, rearing juveniles, and out- migrating fish.
Road Improvements	x	**X**	x	x	x	**X**	x	x					See above
Offstream storage w/forebearance	x		**X**	**X**	x		**X**	**X**	x	**X**	**X**	x	Benefits of increased instream flows will postively affect all life-stages. Oversummering juveniles (coho and steelhead) are likely to derive the most significant benefit, while adult migration and smolt outmigration conditions can be improved, depending on flow schedule. In critical dry years, benefits to rearing should be significant, while benefits to migration may be negligible. Will directly address residual impacts from water withdrawals.
Increased Water Use Efficiency w/forebearance		x	**X**	x		x	**X**	x	x	x	**X**	**X**	See above, benefits will be most pronounced during irrigation season (March-October) for outdoor crops, year round for green houses, etc. Will directly address residual impacts from water withdrawals.
Managed or Improved Recharge		x	**X**	x		x	**X**	x	x	x	**X**	**X**	Benefis will be more pronounced during dry and critically dry years when GW augementation of baseflows may prove critical to enabling oversummer survival. Depending on ancedent climate conditions and timing of rains, benefits for spawning/incubation and outmigration may also be realized. May directly address residual impacts from water withdrawals.
1707 Dedication or Water Rights Purchase	x	x	**X**	x	x	x	**X**	x	x	**X**	**X**	**X**	Dedication of water rights to instram flows will provide benefit to all life stages of both species of salmonid across all water year types. Benefits will be most pronounced during the dry season and in dry years, but can benefit adult migration over critical riffles, spawning/incubation, rearing and out migration to varying extents and directly address residual impacts from water withdrawals.

Appendix A: Table A-2. Restoration Action Comparables

Project Type		***Design/ Permit***		***Construction***		***Total***	***unit***	***# of units***		***cost/unit***
LWD (anchored)										
Zayante	$	97,041	$	235,000	$	332,041	structure	20	$	16,602
Soquel LWD	$	52,000	$	138,000	$	190,000	structure	9	$	21,111
Scotts LWD and Floodplain(I/II)	$	104,000	$	197,000	$	301,000	structure	14	$	21,500
Scotts LWD and Floodplain (III) [mix]	$	76,000	$	84,000	$	160,000	structure	10	$	16,000
SV LWD (I/II) (NRCS did engineering)	$	35,000	$	162,000	$	197,000	structure	9	$	21,889
San Greg Apple	$	52,000	$	132,000	$	184,000	structure	12	$	15,333
San Greg Driscoll	$	68,000	$	160,382	$	228,382	structure	14	$	16,313
average									*$*	*18,393*
average presented in the Draft HCP Conservation Strategy									$	22,000
LWD (unanchored)										
SV LWD (III)	$	22,000	$	58,000	$	80,000	structure	12	$	6,667
Soquel Demo Forest Phase 1 (mix of anchor/unanch	$	52,000	$	71,000	$	123,000	structure	12	$	10,250
average									*$*	*8,458*
Floodplain & Channel Reconfiguration										
Soquel Corridor	$	97,000	$	480,000	$	577,000	linear ft	1000	$	577
Butano Floodplain	$	102,000	$	980,000	$	1,082,000	linear ft	1,200	$	902
average									*$*	*739*
average presented in the Draft HCP Conservation Strategy									*$*	*1,100*
Floodplain/Backwater Via Excavation										
Laguna Floodplain	$	50,397	$	178,250	$	228,647	acre	0.6	$	381,078
Lower San Vicente Backwater Pond	$	88,000	$	191,096	$	279,096	acre	0.50	$	558,192
Upper San Vicente Backwater Pond	$	43,000	$	211,344	$	254,344	acre	0.30	$	847,813
average									*$*	*595,695*
Lagoon Refuge										

Carmel Lagoon Enhancement Project	$	100,015	$	145,277	$	245,292	structure	11	*$*	*22,299*
									$	*22,299*
Rock Weirs										
San Clemente Dam new Carmel River Channel	$	200,000	$	3,426,000	$	3,626,000	weir	53	$	68,415.09
Dam Removal										
Cahill	$	59,900	$	96,000	$	155,900	dam	1	$	155,900
Memorial	$	52,000	$	95,400	$	147,400	dam	1	$	147,400
average									*$*	*151,650*
average presented in the Draft HCP Conservation Strategy									*$*	*78,000*
Small Instream Obstruction Removal										
SLR Boulder Cascade Modification	$	11,142	$	38,000	$	49,142	boulders	1	$	49,142
Remove Concrete Slabs (estimate Branciforte)	$	18,500	$	66,000	$	84,500	concrete	4	$	21,125
average									*$*	*35,134*
average presented in the Draft HCP Conservation Strategy									*$*	*78,000*
Culvert Upgrade or Bridge										
Deer Creek					$	456,900	bridge	1	$	456,900
Koinonia Crossing	$	35,460	$	757,394	$	792,854	bridge	1	$	792,854
Olson Ford	$	156,382	$	840,000	$	996,382	bridge	1	$	996,382
Memorial Park Sequoia Flats	$	48,000	$	347,600	$	395,600	culvert	1	$	395,600
Corralitos/Shingle Mill PM 5.24	$	84,108	$	315,000	$	399,108	culvert	1	$	399,108
Gold Gulch	$	94,388	$	913,500	$	1,007,888	culvert	1	$	1,007,888
average									*$*	*674,789*
average presented in the Draft HCP Conservation Strategy									*$*	*78,000*
Culvert Retrofit (weirs and/or baffles)										
Valencia Cr @ Valencia Dr	$	52,000.0	$	209,843	$	261,843	both	1	$	261,843
Valencia Cr @ Hwy 1 & Soquel Dr	$	87,000.0	$	378,508	$	465,508	baffles	2	$	232,754
Corralitos /Shingle Mill PM 4.8	$	72,625.0	$	220,000	$	292,625	weirs	1	$	292,625
Corralitos Cr PM 2.95	$	58,000.0	$	371,268	$	429,268	both	1	$	429,268

average									*$*	*304,123*
average presented in the Draft HCP Conservation Strategy									$	78,000
Bio-Engineered Large Bank Stabilization										
Corralitos Bio-Eng Bank Stabilization (private orchar	$	47,000	$	268,000	$	315,000	linear ft	113	$	2,787.61
Soquel Bio-Eng Bank Stabilization (Demo Forest)	$	50,000	$	234,640	$	284,640	linear ft	140	$	2,033.14
ADLL Bio-Eng Bank Stabilization (Pleasanton)					$	1,100,000	linear ft	300	$	3,666.67
average									*$*	*2,829.14*
Road Repair/Decommissioning										
Wilder Peasey Road & Crossing Decom	$	37,000	$	86,000	$	123,000	crossings	4	$	30,750
SLR Trib Culvert Removal and Road Decom	$	11,890	$	34,675	$	46,565	crossings	1	$	46,565
Geyer Quarry Rd Decommissioning	$	23,000	$	40,000	$	63,000	sections	4	$	15,750
average									$	31,022
Invasive Plant Eradication (3-4 yr total time)										
SV Clematis Control					$	1,350,000	acres	2.75	$	490,909.09
SV Ivy Control					$	336,000	acres	0.75	$	448,000.00
Ivy Eradication and Reveg on Johnston Ranch					$	397,000	acres	0.8	$	496,250.00
average									$	478,386.36
Riparian Restoration (+ 2 yrs of maintenance)										
Hanson Slough Riparian Restoration	$	15,000	$	126,000	$	141,000	acres	2.55	$	55,294
From Thomson and Pinkerton (2008) (average)					$	65,000	acres	1	$	65,000
average									$	60,147
Instream Flow Projects (Storage)										
Loma Mar Mutual Water Storage Upgrade	$	35,000	$	250,000	$	285,000	acft	0.5	$	570,000
Memorial Park Wate System Storage Upgrade	$	100,000	$	1,250,000	$	1,350,000	acft	3	$	450,000
average									$	510,000
Instream Flow Projects (Efficiency)										
Repetto Farm Water Efficiency Upgrade (pump and sprinklers)					$	150,000	acft	13	$	11,538

<u>Easements or Acquisition</u>							
Riparian (2008 Farm Bill WRP for Santa Cruz Co)	$ 10,000	$ 12,000	$22,000	acres	1	$ 22,000
Water Rights	fair market value?					

Appendix B

Appendix B: Table B-1. NFCF 30 yr cost allocation in 2018 $

Year	Task	Cost	Total Costs	Notes
1	Develop 5 yr project list	$ 25,000		additional $/time to develop/vet projects for 5 yr cycle
1	Project 1: Design	$ 60,000		projects 1, 2, and 3 all smaller & ready to go
1	Project 2 Design	$ 50,000		
1	Project 3: Design	$ 50,000		
			$ 185,000	
2	Project 1: Permit	$ 15,000		
2	Project 2: Design	$ 20,000		
2	Project 3: Design	$ 15,000		
2	Project 2&3: Permitting (batch)	$ 35,000		
2	Project 1: Bid & Contract	$ 15,000		
2	Project 4: Design	$ 60,000		
2	Project 5: Design	$ 90,000		
			$ 250,000	
3	Project 1: Implement	$ 200,000		**Complete 1**
3	Project 2&3: Bid & Contract	$ 25,000		batch
3	Project 4: Permit	$ 20,000		batch
3	Project 5: Design	$ 10,000		
			$ 255,000	
4	Project 2&3: Implement	$ 350,000		**Complete 2 & 3**
4	Project 4: Bid & Contract	$ 15,000		
4	Project 5: Permit	$ 15,000		
			$ 380,000	
5	Project 4: Implement	$ 220,000		**Complete 4.**
5	Project 5: Permit	$ 50,000		larger project, more complex permitting, maybe IS/MND
5	Develop 5 yr project list	$ 30,000		staff/consultant time; assume some of this has been done over time
			$ 300,000	
			$ 1,370,000	End of Yr 5, 4 projects implemented, large project (5) nearly ready
6	5 Yr NFMP Review	$ 30,000		staff and/or consultants, reports, mtgs, and field visits
6	Project 5: Implement Phase 1	$ 250,000		
6	Project 6: Design	$ 20,000		get 3 more project started with small investment (6, 7 & 8)
			$ 300,000	
7	Project 5: Implement Phase 2	$ 250,000		**Complete 5.**
7	Project 6: Design	$ 40,000		
7	Project 7: Design	$ 10,000		
7	Project 8: Design	$ 10,000		
			$ 310,000	
8	Project 6: Permit	$ 15,000		
8	Project 6: Bid & Contract	$ 15,000		
8	Project 7: Design	$ 50,000		
8	Project 8: Design	$ 65,000		
8	Project 7&8: Permit (batch)	$ 30,000		
			$ 175,000	
9	Project 6: Implement	$ 200,000		**Complete 6**
9	Project 7: Bid & Contract	$ 20,000		batch ?
			$ 220,000	
10	Project 7: Implement	$ 200,000		**Complete 7**
10	Project 8: Bid & Contract	$ 20,000		
10	Project 9: Design	$ 60,000		
10	Develop 5 yr project list	$ 20,000		staff and/consultant
			$ 300,000	
			$ 1,305,000	
11	Develop 5 yr project list	$ 25,000		
11	Project 8: Implement	$ 275,000		**Complete 8**
11	Project 9: Design	$ 10,000		
			$ 310,000	
11	Project 9: Permit	$ 20,000		
12	Project 9: Bid & Contract	$ 15,000		

12	Project 10: Design	$ 65,000		
12	Project 11: Design	$ 70,000		
12	Project 12: Design	$ 125,000		large and complex project
			$ 295,000	
13	Project 9: Implement	$ 220,000		**Complete 9**
13	Project 10&11: Permit (batch)	$ 25,000		
13	Project 10&11: Bid & Contract (batch)	$ 20,000		
13	Project 12: Permit	$ 40,000		
			$ 305,000	
14	Project 10&11: Implement	$ 300,000		**Complete 10 & 11**
14	Project 12: Permit	$ 15,000		
			$ 315,000	
15	Project 12: Bid & Contract	$ 25,000		
15	Project 13: Design	$ 60,000		
15	Develop 5 yr project list	$ 30,000		
			$ 115,000	
			$ 1,340,000	
16	5 Yr NFMP Review	$ 30,000		
16	Project 12: Implement Phase 1	$ 250,000		
16	Project 13: Permit	$ 20,000		
			$ 300,000	
17	Project 12: Implement Phase 2	$ 225,000		**Complete 12**
17	Project 13: Bid & Contract	$ 15,000		
			$ 240,000	
18	Project 13: Implement	$ 220,000		**Complete 13**
18	Project 14: Design	$ 50,000		
18	Project 15: Design	$ 20,000		
			$ 290,000	
19	Project 14: Permit	$ 20,000		
19	Project 14: Bid & Contract	$ 15,000		
19	Project 15: Design	$ 40,000		
19	Project 16: Design	$ 70,000		
19	Project 17: Design	$ 120,000		large project
			$ 265,000	
20	Project 14: Implement	$ 220,000		**Complete 14**
20	Project 15&16: Permit	$ 25,000		
20	Project 17: Permit	$ 20,000		
20	Develop 5 yr project list	$ 20,000		
			$ 285,000	
			$ 1,380,000	
21	5 Yr NFMP Review	$ 30,000		
21	Project 15&16:Bid & Contract	$ 20,000		
21	Project 17: Permit	$ 50,000		
21	Project 18: Design	$ 60,000		
21	Project 19: Design	$ 70,000		
			$ 170,000	
22	Project 15&16: Implement	$ 250,000		**Complete 15 and 16**
22	Project 17: Bid & Contract	$ 20,000		
			$ 270,000	
23	Project 17: Implement Phase 1	$ 250,000		
23	Project 18&19: Permit (batch)	$ 25,000		
			$ 275,000	
24	Project 17: Implement Phase 2	$ 250,000		**Complete 17**
24	Project 18&19 Bid & Contract (batch)	$ 15,000		
24	Project 20: Design	$ 30,000		
			$ 295,000	
25	Project 18&19: Implement	$ 305,000		**Complete 18 and 19**
			$ 305,000	
			$ 1,315,000	
26-30	Final 5 years and $ to be used as adpative management & close-out.			
			$1,315,000	
		TOTAL (in 2018 $)	**$8,025,000**	