A General Review of Potential Effects of H.R. 1837, The Sacramento - San Joaquin Valley Water Reliability Act, on Central Valley Salmon Productivity and Salmon Fisheries in Ocean and Inland Waters

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Prepared by staff of the Pacific Fishery Management Council

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INTRODUCTION

The San Joaquin Valley Water Reliability Act, H.R. 1837 amends the Central Valley Project Improvement Act (CVPIA) and includes provisions that would alter water use policy and salmon management in the Sacramento and San Joaquin River basins. H.R. 1837 was introduced in the U.S. House of Representatives on May 11, 2011 by Congressman Devin Nunes (CA) and two cosponsors, and was referred to the Water and Power Subcommittee of the House Natural Resources Committee where it received two hearings in June of 2011.

On February 16, 2012 the U.S. House of Representatives Committee on Natural Resources considered the bill and held a markup session on H.R. 1837 and reported the bill favorably (27-17) to the U.S. House floor. After considerable floor debate on February 29, 2012, H.R. 1837 (as amended) passed the U.S. House of Representative on a vote of 246-175. In early March 2012, the bill was reported in the U.S. Senate where, as of this writing, it has been placed on the U.S. Senate Legislative calendar for consideration.

Specific to fishery matters, the bill changes the CVPIA definition of "anadromous fish" to include only native salmon and sturgeon stocks present in the Sacramento and San Joaquin Rivers as of October 30, 1992, prohibits the Secretary of Commerce from distinguishing between naturally-spawned and hatchery-spawned or otherwise artificially propagated strains of a species in making Endangered Species Act (ESA) determinations, and considers all requirements for the protection and conservation of the species listed under the ESA to be fully met if water projects are operated in a manner consistent with the Bay-Delta Accord of December 15, 1994 (Bay-Delta Accord). Additionally, H.R. 1837 would change the way funds dedicated to river and wildlife restoration would be collected and administered.

The Pacific Fishery Management Council (Pacific Council) and its Legislative Committee addressed this matter at their June 2011 and September 2011 meetings and is scheduled to take up the matter at the upcoming April 2012 meeting. In a July 5, 2011 letter to Pacific Council Executive Director Dr. Donald McIsaac (attached), Congresswoman Grace Napolitano expressed concerns regarding the economic impacts of the 2008 and 2009 fishery closures enacted by the Pacific Council in response to the collapse of Sacramento River fall Chinook (SRFC) stocks and stated that the June hearings highlighted the need for more information on the impacts of H.R. 1837 on fisheries, the fishing industry, tourism and coastal economies and requested Pacific Council comments and analysis on H.R. 1837's impacts to salmon populations, habitat, fisheries management, and fishermen.

In an October 5, 2011 letter to Congresswoman Napolitano on behalf of the Pacific Council, Dr. McIsaac conveyed an initial response on H.R. 1837. The Pacific Council generally shared Congresswoman Napolitano's concerns regarding the potential negative effects of H.R.1837. Noting the complexity of Central Valley water issues and its relationship to salmon populations throughout the basin, as well as the thorough scientific and public review process employed by

the Pacific Council process, both the Pacific Council and Dr. McIsaac advised the Congresswoman that a complete, detailed analysis of H.R.1837 is an enormous endeavor that would require considerable time to complete. This document is a general, qualitative review containing relevant findings.

This document is presented in two major sections. The first focuses on the potential negative effects of H.R. 1837 on fish production. The second focuses on the potential effects of H.R. 1837 on offshore and inland salmon fisheries and Central Valley salmon management.

POTENTIAL NEGATIVE EFFECTS ON FISH PRODUCTION

Central Valley Chinook stocks include fall, late-fall, winter, and spring stocks of the Sacramento and San Joaquin rivers and their tributaries. Two of these stocks are listed under the ESA: (1) Sacramento River winter Chinook, listed as endangered in January 1994; and (2) Central Valley spring Chinook, listed as threatened in September 1999. The aggregate fall and late-fall Chinook stocks (SRFC) are the dominant stock group in the Central Valley and, particularly in abundant years, contribute the majority of the Chinook salmon caught in ocean commercial and recreational fisheries off Oregon and California and also support significant inland fisheries that include private anglers and guided fishing businesses.

WATER FLOW MANAGEMENT

It is generally recognized that there is a critical link between water flow conditions and salmon survival, particularly in drought years. Water management in important migratory times and areas can have substantial effects on salmon survival from the egg stage through the juvenile stage to the point of initial ocean residence. The Congressional Research Service noted in its February 29, 2012 report that "the extent to which [H.R. 1837] would relieve water supply shortages, particularly in drought years is uncertain." The report notes that it is uncertain how H.R. 1837 will change factors affecting water pumping and allocation that are outside the scope of the bill such as state water quality regulations and state water rights (Cody, 2012).

The complex suite of variables of water management, natural variation in the water cycles, and confounding impacts on salmon survival combine to make it difficult to predict the future effects of water management decisions. Many important measures have been made in the interest of balancing the water needs of municipalities, agriculture, industry, and salmon since the Bay-Delta Accord. H.R. 1837 would undo many of these measures, likely tipping the balance away from improved salmon productivity.

SAN JOAQUIN RIVER FLOW AND HABITAT

Less water and less flow in the San Joaquin River will almost certainly perturb salmon runs in the basin over a broad time frame, particularly those runs facing additional habitat challenges beyond the loss of San Joaquin River habitat. H.R. 1837 would undermine habitat restoration efforts in the San Joaquin further reducing the resilience of the basin's salmon runs. Specifically,

Section 105 of the bill weakens CVPIA's restoration requirements and adds a new section (3406(i)) that would lower the threshold for evaluating restoration efforts by only requiring "pursuit" rather attainment of mitigation, protection, restoration and enhancement activities. Decreased flow and habitat restoration and protection efforts would likely reduce salmon production in the San Joaquin resulting in decreased fishery catches and an even greater reliance on the fall Chinook runs in the Sacramento River.

Central Valley Water Management Operations

H.R. 1837 would change the CVPIA to "allow" rather than direct agencies to modify Central Valley Project operations to provide flows for fish and removes the California Fish and Game Commission from the list of agencies to be consulted on instream flows. The bill would disrupt existing water policies and would potentially reallocate 800,000 acre-feet of water currently earmarked for improved river flows for salmon migration. Beyond the direct impacts to the San Joaquin River, H.R. 1837 would alter CVPIA operations in the greater Central Valley, including the Sacramento River and tributaries and the delta-bay estuary. This is of critical importance to salmon and fishery conservation because, as noted in the following section, West Coast and Central Valley salmon fisheries rely on healthy salmon escapement and production from the Sacramento River. Protective measures for Sacramento River salmon to attain escapement goals and meet ESA provisions are often a constraining factor for West Coast fishery management. It appears likely that provisions in HR.1837 would impact river flows throughout the Central Valley and the CVPIA with potential detrimental impacts to salmon stocks from both the Sacramento and San Joaquin basins.

The importance of adequate flows during critical salmon migration periods has been evidenced in salmon return patterns in several West Coast basins, including the Klamath River and the Columbia River. The recent collapse of the SRFC demonstrated the vulnerability of Central Valley salmon runs, a vulnerability that would likely increase if the efforts made since 1994 to improve river conditions for salmon were removed.

Endangered Species Act Implementation Changes

H.R. 1837 considers all requirements for the protection and conservation of the species listed under the ESA to be fully met if water projects are operated in a manner consistent with the Bay-Delta Accord signed December 15, 1994. Reverting to water operation standards of 1994 would predate many of the conservation actions that have been developed for the protection of Chinook salmon stocks listed under the ESA, and disallow future alterations that can enhance abundance from current levels. Such conservation measures increase the production of the listed stocks and the unlisted stocks that receive co-incidental benefits, in comparison to a status quo without these measures in place. For example, there are ESA-related changes in delta water pumping operations that benefit the juvenile to adult survival of not only listed salmon stocks, but also unlisted natural spawning salmon stocks and hatchery stocks. Thus, the ESA-related provisions

of H.R. 1837 are likely to adversely affect the total salmon production from Central Valley stocks.

H.R. 1837 also prohibits the Secretary of Commerce from distinguishing between naturally-spawned and hatchery-spawned or otherwise artificially propagated strains of a species in making ESA determinations. The Council is concerned that there may be situations where this could lessen focus on goals to optimize the production of naturally spawned fish and protect salmon spawning, incubation, and juvenile rearing/outmigration habitat. Both hatchery and naturally-spawned salmon play important roles in Central Valley salmon management. The majority of the SRFC escapement spawns naturally with a long-term average of over 75 percent of the total escapement since 1970. There are differences in the genetic constitution of the various natural and hatchery stocks and it is important to protect all genetic variations if Central Valley salmon production is to be optimized. To balance human benefits such as water needs, vibrant fishing industries and communities, and resilient and productive salmon stocks, it is essential to understand the various contributions and needs of hatchery and naturally-spawned salmon in the Central Valley, something that could be diminished by this language in H.R. 1837.

EFFECTS ON OFFSHORE AND INLAND SALMON FISHERIES

Salmon stocks from the San Joaquin play a secondary role in marine fisheries and fishery management relative to the larger production from the Sacramento River portion of the basin. Adult salmon production in the San Joaquin River is determined largely by spring outflows three years earlier. Since 1986, spawner returns to the San Joaquin River have constituted less than 10 percent of the total Central Valley escapement for fall-run Chinook (PFMC, 2012). However, it is important to note that H.R. 1837 can negatively affect the production of Sacramento River salmon in addition to San Joaquin stocks.

SACRAMENTO RIVER FALL CHINOOK SALMON ESCAPEMENT BENCHMARKS

A key benchmark for Central Valley salmon management in the Pacific Council's Salmon Fishery Management Plan (FMP) is an escapement goal for fall Chinook salmon runs. The adopted escapement goal is set at a range of 122,000 to 180,000 hatchery and natural spawners in the Sacramento Basin. Hatchery and natural spawners in the San Joaquin Basin are not included in this escapement goal, but escapement benchmarks and fishery management provisions for SRFC are expected to provide for San Joaquin stocks in fisheries where both stocks are co-managed. Since 2000, Sacramento fall Chinook escapement has ranged from a high of over 700,000 in 2002 to an historic low of 40,800 in 2009 (PFMC, 2012).

FORECASTS

A critical element of the Pacific Council's preseason management process is the forecasting of future abundance. Each spring, the Council applies peer reviewed forecasting methods to estimate the total abundance of SRFC for the coming year. Fishing opportunity generally only

occurs when total SRFC abundance is estimated to be over the minimum escapement level of 122,000. The greater the total SRFC abundance exceeds the escapement goal, the more surplus production is estimated for potential harvest. In years when the SRFC abundance is near or below the escapement goal minimum, ocean fisheries off California and Oregon are considerably constrained and/or closed. If the SRFC abundance sufficiently exceeds the spawning escapement goal, the Pacific Council and its advisory groups proceed to analyze a range of potential fishing seasons to assess their ability to meet escapement goals as well as the needs of fisherman and fishing communities. Salmon production in the San Joaquin basin contributes to fisheries, although fishery management in the Central Valley is largely based on SRFC. It is generally assumed that the active management and protective measures for SRFC benefit San Joaquin runs, but because San Joaquin salmon runs do not factor into the management benchmarks, they are less likely to be a limiting stock when determining fishing opportunity.

COMMERCIAL AND RECREATIONAL CATCH

California and Oregon ocean Chinook fisheries land a mix of Chinook stocks, but rely heavily on SRFC. In recent years (2008 and 2009), SRFC were the singular limiting factor in ocean salmon management, resulting in extensive closures off Oregon and California. Detailed historic salmon data can be found on the Pacific Council's web page as published in the annual Stock Assessment and Fishery Evaluation document, the *Review of Ocean Salmon Fisheries* (PFMC, 2012).

Commercial troll fisheries off Oregon and California were closed entirely in 2008 and 2009 due to the collapse of the SRFC run and its failure to meet management objectives. Oregon and California salmon landings represent a substantial portion of West Coast Chinook landings which suffered a precipitous decline in response to the SRFC collapse (Figure 1).

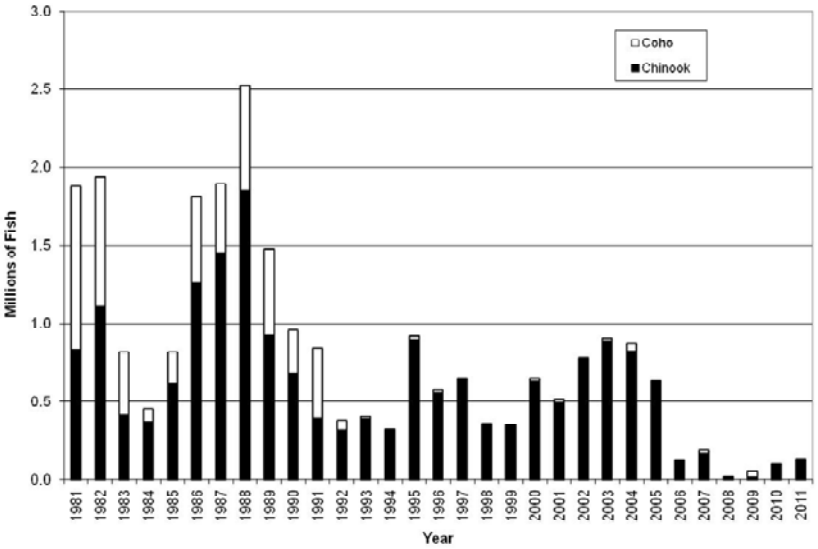

Figure 1. West Coast ocean non-Indian commercial Chinook and coho harvest.

Between 1979 and 2005, California commercial troll landings frequently exceeded 300,000 Chinook, and in 2004 over 500,000 Chinook were landed. During this same time frame, Oregon commercial troll fisheries frequently landed over 150,000 Chinook, and landed over 300,000 Chinook in 2002 and 2003.

Recreational fisheries off Oregon and California are also highly dependent on SRFC and also experienced significant reductions in opportunities for Chinook fishing.

Between 1976 and 2005, combined recreational fisheries in California and Oregon (south of Cape Falcon, Oregon) frequently had years with over 300,000 angler trips resulting in Chinook landings of over 100,000 fish, with a landings of over 275,000 Chinook in 2004. The drastic fishery restrictions of 2008 and 2009 resulted in recreational landings in Oregon and California of approximately 700 and 1,200 Chinook respectively.

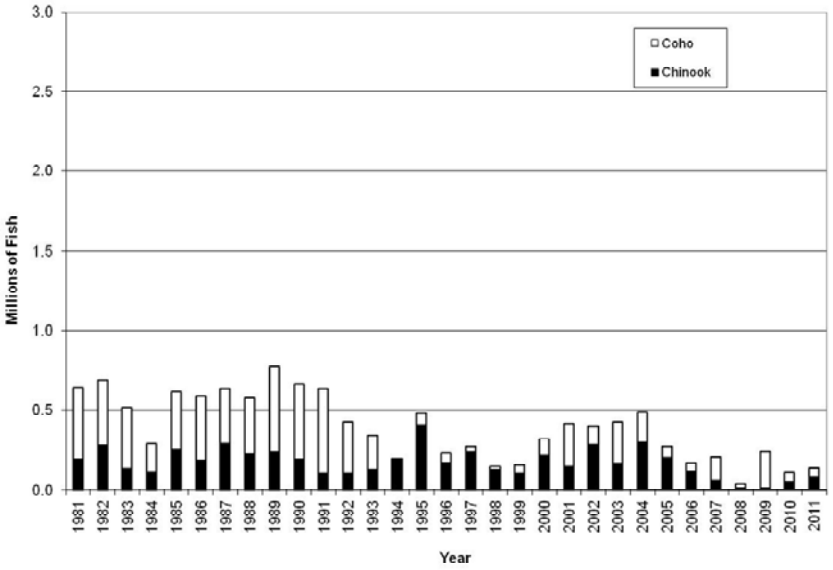

Figure 2. West Coast ocean recreational Chinook and coho harvest.

In addition to ocean fisheries, inland salmon fisheries are popular, locally important, and can be substantial in years of strong abundance. The fishery is comprised of both private sport boats as well as professional fishing guides. Inland fisheries in the Sacramento River provide recreation, harvest opportunity, and local revenue through guide services, bait and tackle sales, accommodations, and the same kind of other peripheral economic impacts as ocean salmon fisheries. The effect of H.R. 1837 on inland recreational fisheries goes beyond recreational salmon fisheries. The bill would also preempt California law with respect to limitations on the size or quantity of take of non-native species that prey upon one or more native fish species, some of which are targeted by inland recreational fisheries.

FISHERY ECONOMICS

Communities on the West Coast exhibit varying degrees of dependence on fishery activity, and within those coastal communities with a relatively high dependence on the fishing industry there are varying degrees of dependence on salmon revenues. For several coastal communities between Monterey Bay, California and the Columbia River, revenues from recreational and commercial salmon fisheries are extremely important. Figure 3 illustrates the devastating effect the 2008 collapse had on exvessel revenue (the direct value of commercially-landed salmon paid to fisherman) in California and Oregon. It is important to note that exvessel revenue is only a beginning indicator of the economic benefits provided to West Coast communities from the commercial salmon fishery. Communities also derive substantial benefits from the recreational

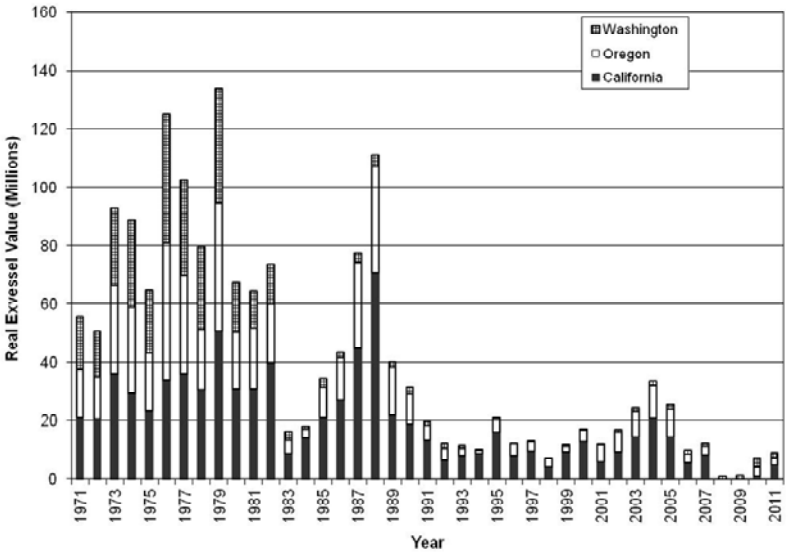

Figure 3. Exvessel value of West Coast ocean non-Indian commercial Chinook and coho landings by state of landing (inflation adjusted, 2011 dollars).

fishery. Additionally, beyond those values reflected in the act of catching the fish are port facilities revenue, boat and tackle sales, fuel purchases, ice and cold storage services, hotel and restaurant expenditures, etc.

The Pacific Council annually estimates the state and local community personal income impacts associated with commercial and recreational ocean salmon fisheries (PFMC, 2012). The estimates are derived by starting with harvesting, processing and first level distribution activities for commercial and recreational salmon fisheries. Commercial personal impact estimates are built around landings and consider both the revenue and costs associated with processing and distribution. Recreational estimates are built around per trip expenditures (fuel, gear, ice, bait) and the number of estimated trips taken. From this starting point, the fishery derived dollars are mapped as they are re-spent in support of local non-fishery businesses and estimates are made of the total personal income generated for business owners and employees. Thus, the Council estimates do not measure total economic activity (e.g. total sales) but rather focus on personal income associated with fishing activity.

Between 2000 and 2007, California commercial fishery personal income estimates averaged $28.4 million per year (inflation adjusted). Fishery closures in 2008 and 2009 wiped out this estimated economic benefit to California. Estimated personal income impacts from California's recreational ocean fishery averaged $15.6 million between 2000 and 2007 and fell to $30 thousand in 2008 and $317 thousand in 2009.

The magnitude of importance of salmon fishery income impacts on coastal communities is clearly evidenced in the 2008 collapse of SRFC and the consequent fishery closures' economic losses sufficient to warrant a $158 million Federal disaster relief effort.

CONCLUSIONS

In the long-term, H.R. 1837's provisions regarding Central Valley water issues, implementation of the ESA, and restoration efforts will likely alter salmon production conditions in the Central Valley. As a general, qualitative conclusion, it appears H.R.1837's provisions would have an

adverse effect on Central Valley salmon habitat, total salmon production, fishery participants, and fishery economic benefits.

A detailed assessment of potential salmon production loss and the loss of fishing revenues resulting from H.R. 1837 is an enormous endeavor of considerable complexity. The foundational matter of a complete analysis of effects on salmon productivity would be complicated and prodigious. Quantifying specific changes in salmon habitat in the San Joaquin basin, the Sacramento River basin, and the Central Valley delta, and San Francisco Bay would involve extensive modeling of water withdrawal and reprogramming alternatives, varied by drought, normal, and wet climate conditions; water management alternatives would need to reflect various possible changes since 1994, and speculate on possible future changes that may be required by existing ESA implementation authority.

Beyond modeling various freshwater flow and habitat parameters, different population dynamic alternatives would need to be delineated even when habitat is stable, total salmon productivity varies substantially between conditions where the parent spawner population is far short of habitat capacity, where the parent spawner population is in the range of optimum spawner abundance, and situations where the number of parent spawners exceeds the number to fully seed habitat capacity. As a further variable, a thorough analysis would need to entail a quantitative genetics module to reflect altering the genetic makeup of the various stocks through time due to the bill's requirement to not distinguish between hatchery and natural stocks. Additionally, estimates of total freshwater salmon production yielded from the preceding variables would need to be advanced to the adult ocean residence stage with consideration of different marine conditions in the ocean migratory path for Central Valley stocks, including highly unfavorable ocean conditions for salmon, such as during the severe 1983 El Niño conditions, through normal conditions, and exceptionally good conditions for salmon survival, such as 2001-2002 and 2011.

Subsequent to analysis of total salmon production effects, it is no less complicated or substantial to achieve a complete analysis of H.R. 1837's effect on catches in marine and freshwater salmon fisheries and the consequent economic effect on the various fishing industry sectors, attendant support sectors such as marinas, boat and fishing gear wholesalers and retailers, tourism, and coastal communities. Modeling various alternative catches in ocean commercial and sport fisheries depends on the status of co-mingled stocks from other rivers such as the Klamath River and the Oregon coast. It is necessary to model catches in different time and area strata along the California and Oregon coasts, which would need to vary to reflect potentially realistic scenarios, to obtain port-specific economic revenue estimates. It is also necessary for modeling to accommodate a substantial range in freshwater fishery catches, as they typically vary collaterally with the size of the ocean fishery. Thus, assessing H.R. 1837's potential impacts to salmon productivity and the consequent fishery-related economic effects represents a considerable analytical challenge.

In general terms, West Coast fisheries and coastal communities rely on a healthy level of salmon production from the Central Valley, of which water and salmon from the San Joaquin basin plays an important role. Freshwater habitat and migratory conditions are critical for salmon populations, and careful water management throughout the Central Valley is essential in optimizing the size of salmon runs and the economic benefits to fisheries and fishing communities that depend on them. Particularly in drought years, the Pacific Council is concerned that H.R. 1837, will have negative effects on salmon productivity and the fishing industry compared to the status quo and improvements that might be forthcoming in the future.

REFERENCES

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