TO: File: Russian River; TMDL Development and Planning

FROM: Steve Butkus

DATE: January 8, 2015

SUBJECT: ASSESSMENT OF SHELL BENEFICIAL USE IN THE RUSSIAN RIVER WATERSHED

Potential pathogen contamination has been identified in the surface waters of the lower and middle Russian River watershed leading to their placement on the federal Clean Water Act Section 303(d) list of impaired waters. The Water Quality Control Plan for the North Coast Region (NCRQWCB 2011), also known as the Basin Plan, designates specific beneficial uses for protection. Specific fecal indicator bacteria concentrations are identified in the Basin Plan's Bacteria Water Quality Objective to assess the support of contact recreation (REC-1), non-contact recreation (REC-2), and "potential" shellfish harvesting (SHELL) beneficial uses.

REC-1 and REC-2 beneficial uses are identified for protection throughout the whole watershed. The "potential" SHELL beneficial use is only identified for protection in a portion of the watershed (i.e., Guerneville, Laguna de Santa Rosa, Santa Rosa, Mark West, Geyserville and Ukiah Hydrologic Sub Areas)(Figure 1). The SHELL beneficial use is defined as water suitable for the collection of filter-feeding shellfish (e.g., clams oysters, and mussels) for human consumption. As such, this use does not protect for crustacean shellfish such as crayfish, which are known to be collected recreationally in the Russian River watershed. REC-1 and REC-2 beneficial uses are apparent throughout the watershed, especially during the summer months. SHELL use in the Russian River watershed is not well known. Agency history does not exist on how this determination of potential shellfish harvest was made for the Russian River.

This memorandum presents the results of a survey of several Russian River watershed stakeholders that may have knowledge of any existing or historical harvest of bivalve shellfish for edible consumption.

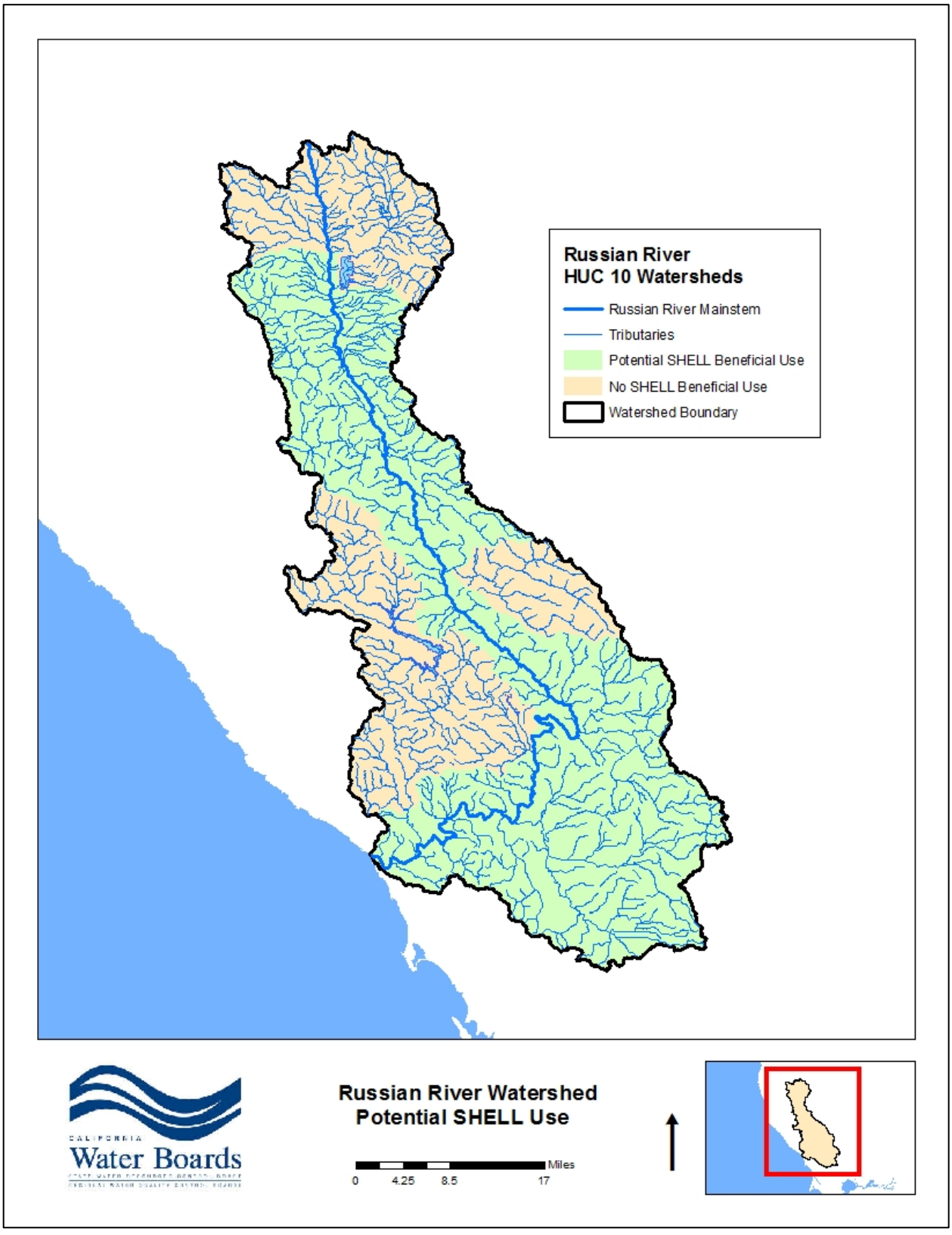

Figure 1. Potential SHELL Use areas in the Russian River Watershed

Three genera of freshwater mussels are found in California: *Anodonta*, *Gonidea* and *Margaritifera*. Howard (2010) conducted a survey of freshwater mussels in California and found only *Anodonata* mussel species were found at thress locations in the Russian River. Staff of the Sonoma County Water Agency report observations of *Anodonta nuttalliana, Margaritifera falcate,* and other freshwater mussel species in the mainstem Russian River, East Fork, and Green Valley Creek. Historically, the Russian River would have supported *Gonidea* mussel species, even though the species was not found in the contemporary survey.

Freshwater mussel shells are known to occur in archaeological sites throughout California. These mussels were used as material in the manufacture of tools, ornaments and buttons, but were most commonly harvested as food resources. While freshwater shellfish have historically been perceived as a marginal food resource, there is substantial archaeological evidence for significant prehistoric use of freshwater mussel for consumption (Melton 1996). In fact, the town of Capella, located north of Ukiah, was named after Cul-pa-lau, the chief of a nearby Pomo tribal village. The Pomo tribal chief's name means "mussel or shell-fish bearer" (Ally, Bowen & Co. 1880). However, archaeological evidence does not exist that shows the freshwater mussels from the Russian River were historically harvested as a food resources.

Findings

Regional Water Board staff questioned several Russian River Watershed stakeholders that may have knowledge of any existing or historical harvest of bivalve shellfish for edible consumption. Water and fishery resource agency staff, non-governmental organizations, and recreational sport fishing suppliers in the watershed were interviewed. Although a thorough survey of tribal shellfish harvest was not conducted, there is anecdotal evidence of traditional tribal use. Based on the stakeholder responses presented in this memorandum, Regional Water Board staff can make the following findings:

- There is no evidence of existing SHELL beneficial use could be found among all the stakeholders questioned.
- There is anecdotal evidence of historical SHELL beneficial use by native Americans.

Question Posed:

- Are you aware of any past or present harvesting of freshwater mussels in the Russian River or its tributaries?

Responses:

Academia

1. Dr. Fraser Shilling (U.C. Davis)
   Primary author of a report on tribal fish consumption in California (Shilling et al. 2014). U.C. Davis researchers interviewed and surveyed tribe members and staff about current and traditional fish use. The survey specifically asked about the edible consumption of mussels.

   "There were specific mentions of freshwater bivalves by North Coast tribes fishing in the Russian River. I found two references to traditional use of mussels from the Russian River. One is from Dry Creek Rancheria (Pomo) and the other from Scotts Valley Band of Pomo (Clear Lake). These tribe members were interviewed directly, so the tribes themselves did not offer the reference to traditional use. Evidence traditional use came from tribe elders."

Resource Agency Staff

2. Greg Langlois - California Department of Public Health
   - CDPH does not have regulatory authority over commercial freshwater shellfish harvest. Only marine bivalve shellfish are covered under the National Shellfish Sanitation Program.

3. Eric Larsen (California Department of Fish and Wildlife)
   CDFW Region 3 has not authorized any commercial harvest of freshwater mussels from the Russian River. Permits for such action require my signature and I have never had one come across my desk in the last 8 years. However, recreational take of freshwater mussels is allowed, but this take is not recorded. Also, I am not aware of a significant body of fresh water mussels in that water way or watershed.

4. George Neillands (California Department of Fish and Wildlife)
   - I have never seen any commercial fishing licenses for harvest of freshwater mussels anywhere in our region. Recreational and tribal I am unaware of. I am not aware of the population status other than one researcher that have found populations have declined dramatically over the years but still exist in 50% of the historical known locations.

5. Jim Moore (CDFW Shellfish Health Laboratory, Bodega Bay, CA)
   - I have not heard of anyone harvesting freshwater mussels for consumption from the Russian River or any other freshwaters in California, although I deal mainly with marine organisms. The only freshwater invertebrates that I am aware of being harvested for human consumption are two or more species of crayfish. I also am not aware of any surveys documenting the populations of freshwater mussels in the Russian River.

6. Jessica Martini Lamb (Sonoma County Water Agency)
   - Observations of freshwater mussels in the Russian River and tributaries are uncommon, although Asian clams are commonly observed. Water Agency biologist's observations of freshwater mussels in the Russian River watershed have been recorded (see below). Water Agency staff are not aware of harvesting of freshwater mussels in the watershed.

Freshwater Mussel Species	Location Observed	Date Observed
Anodonta nuttalliana	Russian River at Bohemian Grove Beach	Unknown
	Russian River near Duncans Mills	Summer 2009
	Russian River downstream of Vacation Beach Dam	Summer 2009
	Russian River at Moscow Rd Bridge	Summer 2010
	Mark West Creek at Slusser Rd	February 2012
	Russian River near Monte Rio	July 2012
	Russian River upstream of Moscow road	Summer 2013
Margaritifera falcata	East Fork Russian River at Potter Valley Rd bridge	April 2009
	East Fork Russian River between Potter Valley and Lake Mendocino	April 2009
	Russian River downstream of Johnson Beach Dam	October 2013
	Russian River upstream of Johnsons Beach Dam	November 2014
Unidentified Species	Russian River between Hacienda Bridge and Steelhead Beach	Unknown
	Green Valley Creek near Forestville	Unknown
	Green Valley Creek near Forestville	October 2014

Non-Governmental Organizations

7. Bobbi Hudson - Executive Director, Pacific Shellfish Institute
   - I am not aware of any freshwater mussel harvest in the region. However, our focus at PSI has always been marine shellfish, so other than exploring freshwater mussels for water quality improvement (primarily literature review) our knowledge is limited. I understand the logic behind evaluating bacteria in regions where shellfish harvest could occur, for the TMDL. However, I would be very surprised if any sizable harvest is currently occurring in the absence of regulatory controls for human health. Recreational harvest for personal consumption is of course a possibility, but any commercial harvest would require the buyers (retail or wholesalers) and sellers to obtain tags for the shellfish product, which is regulated by state and federal agencies. Even wild harvest requires a license and tagging of shellfish product.

Recreational Sport Fishing Suppliers

8. Christa Pollard (Owner of Pacific Sportsman in Windsor): Interviewed on 12/5/2014
   - Has no knowledge of freshwater shellfish occurring in the Russian River, let alone people harvesting them.

9. Mike Erion (Manager of Outdoor ProShop in Rohnert Park) & other store staff who are also recreational fishermen. Interviewed on 12/5/2014
   - Staff members have been out on the river fishing most of the year for the past few decades. None of them claim to have seen or heard of anyone harvesting freshwater shellfish. Quote: "Shellfish in the river upstream of Jenner are way too small to even be considered a snack after spending hours harvesting them."

10. Scott Heemtra (Manager of King's Sport and Tackle in Guerneville) & David Delmue (Staff and recreational fisherman). Interviewed on 12/5/2014
    - Neither stakeholder has ever heard of shellfish harvesting in the Russian River. Stated that even the old timers of the area never mentioned a word of it. Quote: "You gotta be crazy to be going out there to harvest something that small."

Citations

Ally, Bowen & Co. 1880. History of Mendocino County California – The Indians of Mendocino County. San Francisco, CA. Available at http://www.rootsweb.ancestry.com/~cagha/ history/mendocino/mendo1880-167.txt

Butkus, S. 2014. Evidence of Water Contact Recreation Impairments in the Russian River Watershed. Memorandum to the Russian River TMDL File dated June 2, 2014. North Coast Regional Water Quality Control Board, Santa Rosa, CA.

Howard, J. 2010. Sensitive Freshwater Mussel Surveys in the Pacific Southwest Region: Assessment of Conservation Status. Prepared for the USDA Forest Service, Pacific Southwest Region, by The Nature Conservancy, San Francisco, CA.

Melton, L.J. 1996. Freshwater Mussels: an Ecological Perspective for California Archaeologists. *Proceedings of the Society for California Archaeology* Vol. 9: 251-254.

North Coast Regional Water Quality Control Board (NCRWQCB) 2011. Water Quality Control Plan for the North Coast Region, Santa Rosa, CA.

Shilling, F., Negrette, A., Biondini, L., and S. Cardenas. 2014. California Tribes Fish Use: Final Report. A Report for the State Water Resources Control Board and the US Environmental Protection Agency. Agreement # 11-146-250 between SWRCB and UC Davis.