Formatted: Left: 0.9", Right: 0.9"

DRAFT INITIAL STATEMENT OF REASONS

PURPOSE AND RATIONALE OF THE PROPOSED REGULATORY ACTION:

PURPOSE OF REGULATION

Frost protection of crops is a beneficial use of water under section 671 of title 23 of the California Code of Regulations (CCR). During a frost event, however, the high instantaneous demand for water for frost protection by numerous vineyardists and other water users may reduce the flows in the Russian River stream system in ways that are harmful to salmonids. In a letter to the State Water Resources Control Board (State Water Board or Board) dated February 19, 2009, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) requested that the State Water Board take immediate action, such as implementing emergency regulations, to address concerns that high instantaneous demand for water for frost protection may contribute to significant salmonid mortality. The letter documents two episodes of fish stranding mortality that occurred in April 2008, one on Felta Creek in Sonoma County, and the second on the mainstem of the Russian River, near Hopland in Mendocino County.

Coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*Oncorhynchus tshawytscha*), and steelhead (*Oncorhynchus mykiss*) all spawn and rear in the Russian River watershed. Chinook salmon and steelhead are listed as threatened pursuant to the federal ESA. Coho salmon are listed as endangered pursuant to the federal ESA and California ESA and are in danger of extinction in the Russian River. Stranding of juvenile salmonids can occur when flows decrease and water levels recede rapidly. For instance, NOAA (2009b) states juvenile salmonids may become stranded when side channels become disconnected from the main channel, or in extreme dewatering events when pools go dry (Bradford 1997, Hunter 1992). Stranding increases dramatically when flow drops below a certain water level, defined as the critical flow or stage (Hunter 1992). Because of the fragile nature of the fishery, regulatory action to protect this public trust resource is warranted.

Due to a lack of monitoring and eyewitnesses during early hours when frost events occur, there may have been more incidents of stranding than reported by NOAA Fisheries that have not been recorded. Stranded fish of concern tend to be juveniles. When mortality occurs, carcasses tend to be washed downstream and consumed by predators before the event is detected. Scientific research indicates that the two episodes of stream dewatering documented by NOAA Fisheries were not isolated incidents, and diversions for purposes of frost protection likely are adversely affecting salmonids throughout the Russian River watershed. Matthew J. Deitch, G. Mathias Kondolf, and Adina M. Merenlender~~a~~ (Deitch et al.) studied the effects of dispersed, small-scale water projects on streamflow and aquatic ecosystems in the northern California wine country and published the results in a paper titled, “Hydrologic Impacts of Small-Scale Instream Diversions for Frost and Heat Protection in the California Wine Country.” Deitch et al. concluded that small instream diversions during frost events deplete streamflow over short durations. The report also indicates that small instream diversions on other tributaries in the Russian River watershed

may have similar effects, and that the cumulative changes that small water diversions cause to the natural flow regime may play a principal role in limiting valued ecological resources such as anadromous salmonids.

The proposed regulation would ensure that tributaries are protected, in addition to the mainstem of the Russian River. According to NOAA Fisheries, conservation and monitoring in tributaries is critical because these are the areas that provide the majority of the salmonid habitat and where impacts of water diversions for frost protection are likely to be most acute. NOAA Fisheries presented the results of a proximity analysis at a State Water Board workshop in November 2009. The analysis showed that there are 60,640 acres of vineyard in the Russian River watershed. Seventy percent of those vineyards are within 300 feet of salmonid habitat. The Board estimates that approximately 21,198 acres of the vineyards and orchards in the Russian River watershed below Coyote Dam and Warm Springs Dam are frost protected with water from the Russian River stream system. Within the watershed, there are 1,778 miles of potential salmonid habitat. According to NOAA Fisheries, this entire habitat is needed for recovery of the three species listed above.

The State Water Board has a duty to protect, where feasible, the State's public trust resources, including fisheries. The State Water Board also has the authority under article X, section 2 of the California Constitution and Water Code section 100 to prevent the waste or unreasonable use, unreasonable method of use, or the unreasonable method of diversion of all waters of the State. Water Code section 275 directs the State Water Board to "take all appropriate proceedings or actions before executive, legislative, or judicial agencies . . ." to enforce the constitutional and statutory prohibition against waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, commonly referred to as the reasonable use doctrine.

The reasonable use doctrine applies to the diversion and use of both surface water and groundwater, and it applies irrespective of the type of water right held by the diverter or user. (*Peabody v. Vallejo* (1935) 2 Cal.2d 351, 366-367.) What constitutes an unreasonable use, method of use, or method of diversion depends on the facts and circumstances of each case. (*People ex rel. State Water Resources Control Board v. Forni* (1976) 54 Cal.App.3d 743, 750.) Under the reasonable use doctrine, water right holders may be required to endure some inconvenience or to incur reasonable expenses. (*Id.* at pp. 751-752.)

In this case, application of the reasonable use doctrine requires consideration of the benefits of diverting water for purposes of frost protection, the potential harm to salmonids, and the diverters' ability to frost protect without adversely affecting salmonids by coordinating or otherwise managing their diversions to reduce instantaneous demand. Deitch et al. suggest that, if properly managed, the abundance of flow that occurs during wet winters may provide enough water to meet human needs and protect instream uses. This may be accomplished by changing when the diversions occur. For example, water can be diverted to storage prior to a frost event, thereby reducing instantaneous demand during the event. As discussed in greater detail below, a number of other management

tools also exist that can be used to reduce the instantaneous demand for water during frost events. Given the impact to listed species and the availability of feasible alternatives to simultaneous diversions from the stream, uncoordinated, unregulated diversions of water from the Russian River stream system for purposes of frost protection are unreasonable.

The purpose of the proposed regulation is to prevent ~~harm to salmonids~~stranding mortality due to the cumulative effect of instantaneous diversions for purposes of frost protection of crops. The proposed regulation ~~would prohibit~~provides that the diversion of surface water ~~diversions from the Russian River stream system, including~~ or hydraulically connected groundwater~~,~~ from the Russian River for purposes of frost protection from March 15 through May 15 is unreasonable, unless ~~water is diverted~~conducted in accordance with a Board approved water demand management program (WDMP), or the Board determines that a groundwater diversion is not hydraulically connected to the Russian River or any of its tributary streams. Unless they are exempted, diversions that are not in accordance with an approved WDMP would be deemed unreasonable and a violation of Water Code section 100.

Many diverters in the Russian River watershed frost protect under a legitimate basis of right, such as an appropriative (permit, license, or pre-1914), riparian, or ground water right. Unless the State Water Board adopts this regulation, diverters will not necessarily know if their diversions are causing a problem. In addition, although by its terms article X, section 2 of the California Constitution is self-executing, without a comprehensive WDMP, diverters are unlikely to coordinate and manage their diversions to minimize the cumulative impacts of their diversions on fishery resources unless the Board takes steps to enforce the reasonable use doctrine by adopting this regulation or taking some other sort of enforcement action against them. Without a comprehensive regulation, the State Water Board would have to address diversions piecemeal, or in a complex and time-consuming adjudicative proceeding, as described below.

BACKGROUND

Water is diverted from the Russian River and its tributaries for a variety of purposes, including municipal, industrial, domestic, and agricultural use. Two major reservoirs provide water supply storage in the Russian River watershed: Lake Mendocino, formed by Coyote Dam on the East Fork Russian River, and Lake Sonoma, formed by Warm Springs Dam on Dry Creek, a major Russian River tributary. Sonoma County Water Agency (SCWA) operates Lake Mendocino and Lake Sonoma for water supply purposes in accordance with State Water Board Decision 1610, which set instream flow requirements for the mainstem Russian River below Lake Mendocino and for Dry Creek below Lake Sonoma. SCWA, the Mendocino County Russian River Flood Control and Water Conservation Improvement District, as well as the Redwood Valley County Water District hold water rights to divert from the East Fork Russian River at Lake Mendocino for various uses, including municipal and irrigation uses in Mendocino and Sonoma Counties.

Numerous other public and private entities divert from the Russian River and its tributaries as well. In total there are about 1,778 water rights, water right claims, and pending water

right applications in the Russian River watershed. Of this total, 533 records, or 30 percent, provide for the diversion of water for frost protection use.

In general, surface water may be diverted under one of two basic types of water rights: riparian or appropriative. Since December 19, 1914, the acquisition of an appropriative right has required a permit, license, or in the case of a small domestic or stockpond right - a registration from the State Water Board. (Wat. Code, § 1201; *People v. Shirokow* (1980) 26 Cal.3d 301.) Similar to surface water, percolating groundwater may be diverted under one of two basic types of rights: overlying or appropriative. Unlike surface water, a water right permit, license, or registration is not required to acquire an appropriative right to divert percolating groundwater. A permit, license, or registration is required, however, to acquire a post-1914 appropriative right to divert water from a subterranean stream flowing through a known and definite channel. (Wat. Code, § 1200.)

REGULATORY PRECEDENT

The State Water Board previously adopted a regulation regarding frost protection in the Napa River watershed. Under section 735 of the State Water Board's regulations (California Code of Regulations, title 23), all diversions of water from the Napa River stream system between March 15 and May 15 determined to be significant by the Board or a court of competent jurisdiction shall be considered unreasonable and a violation of Water Code Section 100 unless controlled by a watermaster administering a Board or court approved distribution program. Diversions for frost protection and irrigation during this period are restricted to: (1) replenishment of reservoirs filled prior to March 15 under an appropriative water right permit, or (2) diversions permitted by the court.

In 1974, the State Water Board initiated an action in court to enjoin riparian water users on the Napa River from the direct diversion of water for frost protection of Napa Valley vineyards, charging that the diversions were an unreasonable method of diversion of water because the diversions created a high instantaneous rate of demand which depleted the flow of the river during certain periods of time during the frost season. The Board concluded that the only feasible solution to the problem was (1) to require the winter storage of water for frost protection, and (2) to develop other supplemental sources of water so that no direct pumping of water for frost protection would be necessary. On appeal, the First District Court of Appeal concluded that in order to attain the constitutional mandate that waters be put to reasonable and beneficial use, riparian water users could be required to endure some inconvenience and reasonable expense. (*State Water Resources Control Board v. Forni* (1976) 54 Cal.App.3d 743, 751-752.) The Court further upheld section 659 of the State Water Board's regulations (subsequently renumbered as California Code of Regulations, title 23, section 735).

At a State Water Board workshop on April 7, 2009, Kevin Taylor, Department of Water Resources; and Drew Aspegren, Napa Valley Vineyard Engineering, gave a presentation regarding the Napa Watermaster perspective and experience. The Napa regulation has been successful and is an example where diverters have used offstream storage and

coordinated their diversions in order to reduce instantaneous demand on the stream system.

DEMAND MANAGEMENT

Proper management of diversions for frost purposes can reduce the instantaneous demand on the stream system. For instance, a grower may have a vineyard with a variety of crops, which bud out at different rates, planted at various elevations. There may be instances when only certain varietals or crops at certain elevations require frost protection. By placing valves in the frost system, the grower could control which areas to frost protect and not needlessly frost protect the entire property. Growers may also frost protect on days where there is no frost requirement merely as a precautionary practice. A grower may suspect that a frost event will occur and begin frost protection only to find out later that it was unnecessary. More sophisticated frost forecasting and on-site wet bulb[1] monitoring may reduce the need to frost protect on certain days. A third management practice to reduce the instantaneous demand on the stream system is for the grower to only frost protect for the amount of time necessary. A grower may turn on sprinklers and leave them on longer than necessary, again as a precautionary practice against frost damage. It is possible that closer monitoring of frost events, wet bulb temperature, etc., could reduce the amount of water required to frost protect.

Additional ways in which diversions may be managed include, but are not limited to, (1) timed releases from Lake Mendocino and Warm Springs Dam in anticipation of a frost event to meet the increased demand downstream, (2) build offstream reservoirs to allow storage in the winter prior to the frost season and for refill during non-peak hours after frost events, (3) install wind machines, (4) install cold air drains, (5) use heaters, (6) install wells that attenuate or eliminate the impact of diversions on stream stage[2], (7) conserve water through best management practices, (8) switch to less frost sensitive varietals, or (9) a combination of the methods described above.

WATER DEMAND MANAGEMENT PROGRAM (WDMP)

The two episodes of fish stranding mortality that occurred in April 2008 indicate that at times the cumulative demand for water for frost protection in a watershed may be greater than the available supply and salmonid needs. If the cumulative demand for frost protection exceeds the supply, when taking into account the needs of fishery resources, then that demand needs to be managed. An over-arching water demand management program for frost diversions will serve to protect fishery resources.

---

[1] The wet bulb is the air temperature that occurs when heat is removed from the air to evaporate water until the air becomes saturated. It is measured with a psychrometer or calculated from dew point and air temperature.

[2] Stage is the level of the water in a river measured with reference to some arbitrary zero level or datum.

The adoption of the proposed regulation allows water users to divert water for frost protection provided they are in accordance with a WDMP that has been approved by the State Water Board. Any WDMP must ensure that the cumulative diversion rate for frost protection of the participants in the WDMP will not result in a reduction in stream stage that is harmful to salmonids. The regulation would allow for multiple programs, should a WDMP need to be tailored to a specific geographic area or other situation. The WDMP would be administered by an individual or governing body (governing body) capable of meeting the requirements of the regulation.

The regulation would require a WDMP to include the following elements: (1) an inventory of the frost diversion systems within the area subject to the WDMP, (2) a stream stage monitoring program, (3) a~~n annual~~ risk assessment, (4) ~~identification~~development and implementation of a~~ny~~ corrective ~~actions~~action plan if necessary to ~~avoid harm to salmonids~~prevent stranding mortality, and (5) annual reporting to the Board.

The frost inventory would be required to include the name of the diverter; the source of water used and diversion location; a description of the diversion system and its capacity; acreage served; and the rate of diversion, hours of operation, and volume of water diverted during each frost event. Because conditions of many permits and licenses and the recent legislative changes to Water Code section 5103, subd. (e), require that surface diverters install and maintain measuring devices using best available technology and best engineering practices to measure their diversions, this regulation does not need to specify such requirements.

The regulation would require the governing body to develop a stream stage monitoring program in consultation with NOAA Fisheries and the Department of Fish and Game (DFG). The program would involve identification of critical stream reaches where stream stage monitoring gages would be installed and, at a minimum, a determination of the stream stage that ~~is protective of~~would protect salmonids from stranding mortality for each stream reach being monitored by each installed gage. The program would include the installation, calibration and maintenance of the gages; and monitoring and recording of stream stage data at intervals not to exceed 15 minutes.

Protection of salmonids from stranding mortality would consist of protection from stranding at stream channel features, such as gravel bars, side channels, and pocket pools along river margins. Protection of salmonids from stranding mortality would also include prevention of conditions that would allow exposure to air and mortality of juvenile salmonids and desiccation of redds due to inadequate flow in the active channel.

An approach for determining ~~a critical stream stage that protects salmonids from stranding mortality due to rapid decreases in stream flow~~ the stream stage that would prevent stranding mortality on gravel bars, side channels, and pocket pools along river margins may consist of the following: Transects would be placed along limiting reaches and channel features where the possibility of stranding ~~may occur. A stream~~exists during the frost season flow conditions. The limiting stage ~~that would prevent salmonid stranding~~

~~mortality~~ may be determined by plotting the wetted area versus stream flow for each transect, then identifying the inflection point of the resultant curve. This inflection point elevation would be ~~used to determine~~ the critical stage for that transect. ~~If the installed gage is not located along the limiting transect, the stream stage that will be monitored at the gage may be determined based on stream geometry and stage discharge relationships~~When the critical stage for one transect ensures the critical stages at other transects are met during stream flow conditions, that one transect critical stage can be used for monitoring of other transects. The stream stage that should be monitored at the installed gage location for that transect would be based on correlation of the gage stage with the transect stage at equal flow conditions.

If the methodology described above results in a critical stream stage that would limit diversions for frost protection, it may be possible to establish a lower stage, provided that the lower stage is coupled with management tools that will ensure that stranding mortality does not occur. For example, it may be possible to establish a lower stage if the cumulative rates of diversion for frost protection are managed during the period when stream flows are below the inflection point to allow juvenile salmonids on river margins the ability to escape when water recedes. This lower stage may be determined at the widest, shallowest riffle in the stream reach, and should be high enough to prevent drying out and mortality of juvenile salmonids and desiccation of redds, while maintaining a continuously wetted stream channel. If such an approach is pursued, a more rigorous diversion and stream stage monitoring and reporting program probably would be warranted, including the posting of real-time stream stage monitoring data on a public internet site.

In some situations where channel features that present a risk of stranding, such as gravel bars, side channels, and pocket pools along river margins, are not present, it may be possible to establish only a critical stream stage that prevents drying out and mortality of juvenile salmonids and desiccation of redds, while maintaining a continuously wetted stream channel.

Based on the frost inventory and stream stage information described above, and information concerning the presence of habitat for salmonids, the regulation would require the governing body to conduct a risk assessment that evaluates the potential for frost diversions to cause fish stranding and mortality and warn growers of the potential risk.

The WDMP would not immediately require frost diverters to implement corrective actions such as conversion to alternative water sources, or implementation of best management practices (BMPs). Rather, the WDMP would require the governing body to perform an annual risk assessment. If a potential risk is identified, the ~~diverters,~~ governing body, in consultation with the ~~governing body,~~ diverters, would develop ~~and~~ a corrective action plan, which the diverters would be required to implement. In developing the corrective action plan, the governing body shall consider the relative water right priorities of the diverters and any time delay between groundwater diversions and a reduction in stream stage. The corrective action plan shall include a schedule of implementation. To the extent feasible, the corrective action plan shall include interim corrective actions if long-term corrective actions are anticipated to take over three years to fully implement. The

diverters shall implement corrective actions in accordance with the corrective action plan, or cease diverting water for frost protection.

When determining the relative impact of a groundwater well to stream stage, the governing body may consider the methodology provided in the 2008 technical memo prepared by Stetson Engineers, Inc., *Approach to Delineate Subterranean Streams and Determine Potential Streamflow Depletion Areas,* Stetson Engineers, Inc.

The proposed regulation would require the governing body responsible for administering the WDMP to prepare and submit to the Board an annual report that includes (1) the frost inventory, including diversion data, (2) stream stage monitoring data, (3) the risk assessment and its results, and (4) a description of any corrective action plan developed by the governing body, any corrective actions identified or implemented to date, and a schedule for implementing any additional corrective actions. The report would also be required to assess whether the requirements of the program were met during the preceding ~~frost season~~year, evaluate the effectiveness of the WDMP, and recommend any necessary changes to the program prior to the next frost season. The State Water Board will annually review the WDMP, and may require changes to the WDMP, including but not limited to the risk assessment, corrective ~~actions~~action plan, and schedule of implementation, at any time.

The Board recognizes that that it may take time for aspects of the WDMP to be completed, such as the identification of all sensitive stream reaches, installation of stream gages, completion of a comprehensive risk assessment, and implementation of any necessary corrective actions. The regulation would require any WDMP to include a schedule for conducting the frost inventory, developing and implementing the stream stage monitoring program, and conducting the risk assessment. ~~As stated above, the annual report would be required to include a schedule for completing any necessary corrective actions that remain to be implemented.~~If the risk assessment identifies a potential risk of stranding mortality and a corrective action plan is required, the plan must include a schedule of implementation. In addition, the regulation would allow for annual updates to the WDMP that may include revisions to risk assessments and updates to corrective action plans.

DIVERSIONS ABOVE COYOTE DAM AND WARM SPRINGS DAM

The proposed regulation would not apply to diversions above Coyote Dam or Warm Springs Dam because those two dams are barriers to salmonid migration. Accordingly, diversions for purposes of frost protection above the dams do not have the potential to harm threatened or endangered salmonids above the dams. In addition, any potential effects of diversions at or above the dams on salmonids below the dams would be mitigated by the large storage capacity of the reservoirs and the instream flow requirements imposed by Decision 1610. The regulation would apply, however, to water released from Lake Mendocino or Lake Sonoma and subsequently rediverted at downstream points of diversion. The uncoordinated diversion or rediversion of water below Coyote Dam or Warm Springs Dam does have the potential to harm salmonids,

despite the instream flow requirements imposed by Decision 1610, as evidenced by the fish stranding mortality event on the mainstem of the Russian River in April, 2008.

GROUNDWATER

The proposed regulation would apply to groundwater pumped for the purpose of frost protection that is hydraulically connected to the Russian River or its tributaries. The regulation would define hydraulically connected groundwater to include all groundwater pumped from the Russian River stream system, unless the user can demonstrate to the Board's satisfaction that the source is not hydraulically connected to the Russian River or its tributaries.

Hydraulically connected groundwater most likely includes groundwater within specified areas delineated on maps prepared by Stetson Engineers (Stetson) during development of the Policy for Maintaining Instream Flows in Northern California Coastal Streams, (Stetson, 2008). The areas in question encompass subterranean flows, mapped stream channel and associated alluvial deposits within a potential stream depletion areas, and potential stream depletion areas identified in the maps' legends as follows:

- Subterranean Flow,

- ~~Potential Stream Depletion Area, and~~

- Mapped stream channel and associated alluvial deposits within a potential stream depletion area. Wells pumping from these deposits are likely to result in greater and more immediate stream depletion, and

- Potential Stream Depletion Area.

The proposed regulation would apply to groundwater because groundwater pumping can contribute to a cumulative reduction in stream stage during a frost event. In the Russian River watershed where streams and adjacent alluvial aquifers are hydraulically connected, groundwater pumping threatens streamflow by depletion (Stetson, February 2008). Stream depletion from wells can result from direct depletion of the stream or reduction of groundwater flow to the stream. Groundwater moves laterally from alluvial deposits to the stream channel deposits and then is discharged to the stream baseflow. Wells pumping from the subterranean streams, mapped stream channels and associated alluvial deposits within potential stream depletion areas, and potential stream depletion areas delineated on Stetson's maps are likely to intercept groundwater moving toward the stream which would ultimately discharge to the stream. ~~Although the~~The State Water Board ~~does not have permitting authority over percolating groundwater, it does have~~has the authority to prevent waste or unreasonable use or unreasonable method of use of all water resources of the state, including percolating groundwater.

In a 2008 technical memo prepared by Stetson Engineers, Inc., *Approach to Delineate Subterranean Streams and Determine Potential Streamflow Depletion Areas,* Stetson

Engineers, Inc. provided an explanation of the difference between a well that can be assumed to be hydraulically connected to the natural stream channel from one that is not as follows:

> A well does not have potential to deplete a stream if the well is sealed throughout the alluvium deposits that are in hydraulic connection with the stream and if the well is pumping water from an aquifer that is hydraulically disconnected from the natural channel or subterranean stream.

Well owners may be able to determine if their wells do not tap groundwater that is hydraulically connected by reviewing the Well Completion Reports that are required by law to be filed with the Department of Water Resources. Well completion reports contain information pertaining to well depth, soil geology, placement of screens and capacity. http://www.water.ca.gov/pubs/groundwater/how_to_fill_out_a_well_completion_report/32957_book.pdf

ENFORCEMENT

Diverting water for purposes of frost protection in violation of the proposed regulation would be subject to enforcement action. In addition, the proposed regulation provides that compliance with the regulation shall constitute a condition of all water right permits and licenses that authorize the diversion of water from the Russian River stream system for purposes of frost protection. This includes permits and licenses authorizing diversions from March 15 through May 15 for agricultural or irrigation use that were issued by the Board prior to 1979, when frost protection became a separate use under the Board's regulations. The purpose of this provision is to make compliance with the regulation an enforceable condition of permits and licenses.

TECHNICAL, THEORETICAL, AND/OR EMPIRICAL STUDY, REPORTS, OR DOCUMENTS RELIED UPON IN PROPOSING THIS REGULATION.

Bradford, M.J. An experimental study of stranding of juvenile salmonids on gravel bars and sidechannels during rapid flow decreases. Regulated Rivers: Research and Management 13:395-401 (1997).

Deitch, M., G.M. Kondolf, and A.M. Merenlender, "Hydrologic Impacts of Small-Scale Instream Diversions for Frost and Heat Protection in the California Wine Country." Published in: River Research and Applications 25(2): 118-134 (2009).

Edmundson, Steven A., National Oceanic and Atmospheric Administration National Marine Fisheries Service, letter to Chairman Charles Hoppin, State Water Resources Control Board, November 10, 2009.

Edmundson, Steven A., National Oceanic and Atmospheric Administration National Marine Fisheries Service, letter to Victoria Whitney, State Water Resources Control Board Division of Water Rights, February 19, 2009.

Hunter, M.A., Hydropower flow fluctuations and salmonids: A review of the biological effects, mechnical causes, and options for mitigation. State of Washington Department of Fisheries, Technical Report 199, 46 pp. (1992).

Kondolf, Matt. Comment Letter for Frost Protection Working Group Meeting, March 30, 2010.

National Oceanic and Atmospheric Administration, National Marine Fisheries Service, "Frost Protection and Salmonids. A threat assessment review and recommendations for future action", presentation for State Water Board workshop, November 18, 2009.

National Oceanic and Atmospheric Administration National Marine Fisheries Service, "Frost Protection Threat Assessment for Threatened and Endangered Salmonids in the Russian River Watershed," November 10, 2009.

National Oceanic and Atmospheric Administration National Marine Fisheries Service, "Scope of Potential Frost Protection Impacts on Salmonids. With an Emphasis on the Russian River" presentation for State Water Board workshop, April 7, 2009.

Stacey, Gary B., California Department of Fish and Game, memorandum to Victoria A. Whitney, State Water Resources Control Board Division of Water Rights, November 9, 2009.

State of California, Department of Fish and Game, "Frost Protection Diversions in Mendocino and Sonoma Counties", presentation for State Water Board workshop, November 18, 2009.

State of California, State Water Resources Control Board, "Draft Economic and Fiscal Impacts of the Proposed Russian River Frost Regulation", April 20, 2011.

State of California, State Water Resources Control Board, "Draft Environmental Impact Report for the Russian River Frost Protection Regulation", May 2011.

Stetson Engineers Inc., Technical Memorandum titled, "Approach to Delineate Subterranean Streams and Determine Potential Streamflow Depletion Areas, Policy for Maintaining Instream Flows in Northern California Coastal Streams," February 28, 2008.

Stetson Engineers, Inc., Draft Technical Memorandum titled, "Methodology and Sources of Information. Delineation of Subterranean Streams and Potential Streamflow Depletion Areas, Policy for Maintaining Instream Flows in Northern California Coastal Streams," May 16, 2008.

Stetson Engineers, Inc., Maps of Russian River Watershed, February 22, March 8, and March 9, 2008.

University of California Cooperative Extension, “Frost Protection Considerations”, presentation for State Water Board workshop, November 18, 2009.

REASONABLE ALTERNATIVES TO THE REGULATION AND THE AGENCY'S REASONS FOR REJECTING THOSE ALTERNATIVES.

Following a workshop on April 7, 2009, many diverters in the Russian River watershed focused on voluntary efforts to prevent a reoccurrence of any stream dewatering that may impact salmonids. Since that time, those programs have been refined and improved. One program is the Russian River Frost Program (RRFP). The RRFP is a collaborative effort by winegrape growers, Sonoma County Farm Bureau, Mendocino County Farm Bureau, Russian River Flood Control and Water Conservation Improvement District and California Land Stewardship Institute to manage the diversion and use of water for frost protection. The principal goal of the RRFP is to reduce any acute effects on stream flow from direct diversions during frost periods through two means: reducing the demand for water for frost protection (e.g., Best Management Practices) and changing the manner of diversion (e.g., shift from direct diversion from streams to diversion by well or to offstream storage).

Some off-stream ponds intended to reduce water diversion rates have already been constructed, alternative water sources are being developed, and Best Management Practices are being implemented. Actions have been taken to reduce the risk of stranding in the locations noted in NOAA Fisheries' February 19, 2009 letter and there have been no additional reports of stranding in those areas. However, the RRFP is not yet sufficient to ensure that salmonids are protected from the effects of frost pumping, particularly on the tributaries. Additionally, the RRFP involves voluntary participation. It is not possible to reliably coordinate diversions to avoid dewatering the stream if all diverters who may have a cumulative impact on that stream are not part of the program. There may be significant diverters who would not participate without the proposed regulation. Without a coordinated program with comprehensive participation, diverters will not know when or how much water they can divert without adversely impacting salmonids. The RRFP also does not adequately address the potential harm to salmonids during a dry year. At some point, there may not be enough water to meet all diversion needs in a dry year.

As an alternative to the regulation, the State Water Board could rely on Sonoma County Chapter 11B Vineyard and Orchard Frost Protection Ordinance (Ordinance) that was adopted by the Sonoma County Board of Supervisors on December 14, 2010. The Ordinance establishes a registration program and requires all owners of vineyard and orchard frost protection systems in the Russian River watershed within Sonoma County to participate in a comprehensive monitoring program. The ordinance requires all frost water protection users to annually register with the Agricultural Commissioner. The Ordinance does not, however, include specific details of the monitoring program, which must be developed in consultation with NOAA Fisheries, the California Department of Fish and Game, and the State Water Board. Nor does the ordinance set firm deadlines for developing and implementing the monitoring program. A monitoring program has not yet been developed. Therefore, the Ordinance does not currently provide for stream or

diversion monitoring. Without the knowledge of the quantity and timing of frost diversions and a stream monitoring program, there is no guarantee that the Ordinance, by itself, will do enough to prevent ~~harm to salmonids~~stranding mortality In addition, any monitoring program that is developed may not be adequate if it does not provide for transparency of records. Another short-coming of the Sonoma County Ordinance is that it does not require corrective action if a risk of harm to salmonids is identified. Finally, the Ordinance does not address the potential risk of ~~harm to salmonids~~stranding mortality attributable to diversions for purposes of frost protection in Mendocino County.

As another alternative to the proposed regulation, the State Water Board could conduct an adjudicative proceeding or proceedings against the agricultural diverters in the Russian River watershed to determine whether their diversion and use of water for purposes of frost protection is reasonable. (See Cal. Code Regs., tit. 23, §§ 855-860.) In light of the cumulative nature of the problem, however, conducting an adjudicative proceeding or proceedings would not be the most effective regulatory mechanism for addressing the cumulative impacts of numerous diversions. Because the impacts to salmonids are cumulative, it would be difficult to determine whether the practices of an individual diverter are reasonable without taking into consideration the practices of other diverters, and the relative water right priorities of the diverters. Accordingly, a complex, multi-party adjudicative proceeding likely would be required, which would be time-consuming and expensive for the frost diverters as well as the State Water Board. Judging from the number of water right holders in the watershed, such a proceeding could include hundred of frost diverters, and could take several years. In the interim, diversions for purposes of frost protection could continue to impact salmonid species, which are or are likely to become at risk of extinction.

For the foregoing reasons, adoption of the proposed regulation is the most effective regulatory mechanism for addressing the cumulative impacts of high instantaneous demand from diversions for purposes of frost protection on salmonids in the Russian River watershed. The proposed regulation would allow diverters the flexibility to develop their own solution to the problem, in the form of a WDMP that meets certain criteria, as set forth above. This approach is likely to be much more efficient than conducting a multi-party adjudicative proceeding.

REASONABLE ALTERNATIVES TO THE PROPOSED REGULATORY ACTION THAT WOULD LESSEN ANY ADVERSE IMPACT ON SMALL BUSINESS.

Small businesses could be exempted from the proposed regulation. But that would defeat the purpose of the regulation. The cumulative instantaneous demand from numerous small diversions for frost protection can cause fish stranding mortality.

DUPLICATION OR CONFLICTS WITH FEDERAL REGULATIONS:

The proposed regulation does not unnecessarily duplicate or conflict with federal regulations. A review of the Code of Federal Regulations did not indicate the existence of

duplicative or conflicting law. The State Water Board's authority to regulate diversions under article X, section 2 of the California Constitution is unique.