

November 30, 2010

State Water Resources Control Board
Attention: Bill Cowan
1001 I. Street, 14th Floor
Sacramento, CA 95812-2000
Email: rrfrostregulation@waterboards.ca.gov

Via: Email Only

Re: Comments on Proposed Russian River Frost Regulation Notice of Preparation of the Environmental Impact Report

Dear Mr. Cowan,

1.0 Background

The Russian River Frost Program (RRFP), a two-county coalition of agricultural organizations formed in 2009 to address water management issues in the Russian River watershed, submits the following comments on the appropriate scope of the Environmental Impact Report (EIR) being prepared for the proposed Russian River Frost Regulation. The main organizations involved in the RRFP include the Sonoma and Mendocino County Farm Bureaus, the Mendocino County Russian River Flood Control and Water Conservation Improvement District, and the California Land Stewardship Institute. Additional supporting organizations include the Mendocino and Sonoma County UC Cooperative Extension viticulture representatives, the Sonoma and Mendocino Wine/ Wine Grape Commissions as well as representatives for the local County Boards of Supervisors. The RRFP also includes hundreds of growers and represents those growers in negotiations with regulators, in development of water conservation programs and construction of water infrastructure, and in training and educating growers in new technology to address water issues.

1.0 Background

The NOP Does Not Provide a Valid Reason for the Proposed Regulation

The NOP references a letter dated February 19, 2009 from the National Marine Fisheries Service (NMFS) to the SWRCB describing two instances of fish stranding assumed to be the result of water diversions for the purpose of frost protecting crops. Both stranding events described in the letter occurred in April 2008, one on Felta Creek in Sonoma County and the other on the main stem of the Russian River near Hopland in Mendocino County. The NOP indicates that the SWRCB is relying solely on the allegations in this NMFS letter as the basis for explaining why a regulation of the use of Russian River Watershed water for frost protection purposes is necessary. For the reasons explained below, this reliance is misplaced

First, it is important to recognize that the concerns raised by the NMFS letter were acute problems in discrete locations that occurred during an unusually cold and dry spring and are not

endemic to the entire Russian River watershed. While the importance of these episodes is not to be understated, these two occurrences do not support the generalization that salmon stranding are a chronic problem occurring every year throughout the entire Russian River watershed. The vast majority of years are not as critically cold and dry as 2008 and 2009; nor do the conditions that existed near the locations where stranded salmonids were found exist throughout the entire Russian River watershed. Basically, it does not follow that two instances of stranding, only allegedly due to diversions for frost protection, justify a conditional ban on all frost diversions throughout the entire watershed.

Second, management and infrastructure improvements have already been made to resolve any contributions frost diversions may have had on the stranding incidents described in NMFS February 19, 2009 letter. As a result of a SWRCB workshop held in April 2009, water users set to work to develop a plan, now formalized as the RRFPP, to mitigate any contribution frost diversions may have had on the instances of stranding that occurred and worked to make additional management and infrastructure changes to improve conditions for salmonids. Since then, local voluntary actions on the part of landowners, wine grape and pear growers, as well as the RRFPP, has resolved any impacts frost diversions may have had on the issues brought forward in the February 19, 2009 NMFS letter

The stranding incident on the Russian River near Hopland, which was related to an instantaneous 83 cfs drop in river stage, was resolved by numerous property owners who were directly diverting water from the Upper Russian River. Since 2008, these individuals have invested in the installation of off-stream storage ponds which permanently reduced the cumulative instantaneous demand on the Russian River by 87 cfs. Regarding the stranding incident on Felta Creek, the property owner has invested in a groundwater well and an off-stream storage pond and no longer diverts water from Felta Creek.

Since both stranding event locations identified by NMFS in the February 19, 2009 letter have been addressed and resolved, and no additional supporting documentation has been brought forward from NMFS indicating additional stranding events, the SWRCB must identify the current reason why a regulation on the use of frost water in the Russian River is necessary.

The Proposed Regulation Should Not Exclude Other Water Users

Within the background section of the NOP it is stated that, “During a frost event, the high instantaneous demand for water for frost protection by numerous vineyardists and *OTHER WATER USERS* may reduce the flow or stage in the Russian River stream system to levels that are harmful to salmonids.” The NOP identifies the fact that other water users may have negative impacts on salmonids, yet the SWRCB only proposes to apply the regulation to frost protection diversions. The SWRCB should address the impacts on salmonids from non-frost diversions, such as municipalities in the EIR process.

The Proposed Regulation Would Exceed the SWRCB's Authority

The NOP also indicates the SWRCB is relying on its authority pursuant to Article X, Section 2 of the California Constitution and Water Code section 100 to prevent the waste and unreasonable use of all waters of the state as a basis for the regulation of frost water diversions in the Russian River watershed. However, a single letter describing two instances of fish stranding allegedly due to frost water use is not substantial evidence sufficient to demonstrate that every existing frost water diversion in the Russian River watershed is *per se* unreasonable. The law provides specific standards for determining whether a particular use is unreasonable and each water user has the right to be heard regarding whether their individual diversion is in fact unreasonable.

The Term "Harmful to Salmonids" Must be Clarified

The background section of the NOP indicates that the standard used in determining what will be considered an unreasonable use of water will be whatever is "harmful to salmonids." However, this standard is too ambiguous to ascertain what the proposed Regulation is intended to accomplish. Furthermore, although it is not explicitly stated from the NOP, it appears that the SWRCB is asserting that any water use that potentially is harmful to salmonids is *per se* unreasonable. We are aware of no such standard regarding the reasonable use doctrine. Therefore, the SWRCB should clearly define what is meant to be "harmful to salmonids" in order for appropriate understanding of the project.

It is also important to clarify how the proposed regulation will relate to licensed or permitted diversions within the Russian River watershed that already contain provisions intended to be protective of salmonids. It is not clear how a diversion that already contains terms and conditions intended to be protective of salmonids, could possibly be deemed unreasonable because it is assumed to be "harmful to salmonids." This inconsistency should be clarified before any proposed regulation or EIR is developed.

Finally, to the extent the SWRCB is using the same meaning of the phrase "harmful to salmonids" as it is typically defined under the Endangered Species Act, the proposed regulation is inherently redundant. Since the Federal Endangered Species Act and the California Endangered Species Act already prohibit such acts, an overly broad regulation attempting to do the same is unnecessarily redundant.

2.0 Project Description:

The NOP shall provide the responsible and trustee agencies "with sufficient information describing the project and the potential environmental effects to enable the responsible agencies to make a *meaningful response*." Cal. Code Regs., tit. 14, § 15082(a)(1) (emphasis added). More specifically, the purpose of the NOP and scoping is to solicit input on the significant

environmental issues, reasonable alternatives and mitigation measures that should be considered in the EIR. *Id.* §§ 15082(b), 15083. This means that a clear statement of the project purpose and objectives are essential for an NOP to solicit meaningful input because an EIR's alternatives derive from the project purpose and objectives. *Id.* §§ 15124 (“An EIR should include a clearly written statement of objectives to help the lead agency develop a reasonable range of alternatives to evaluate in the EIR.”); 15126.6(a) (“The EIR must analyze a reasonable range of alternatives to the proposed project that would feasibly attain most of the project’s basic objectives while reducing any of its significant effects.”).

This NOP narrowly defines the project objective in Section 2.0 Project Description as a regulation with specific terms, as follows:

The primary objective of the proposed project is to develop a State Water Board regulation by adding Section 862, Russian River, Special to division 3 of title 23, California Code of Regulations. The proposed Regulation would prohibit diversions from the Russian River stream system for purposes of frost protection from March 15 through May 15, unless they are in accordance with a WDMP approved by the State Water Board. The proposed Regulation would apply to all diversions, including hydraulically connected groundwater, regardless of the diverter’s basis of right, unless a diversion is exempted by the Board. In order to be approved, a WDMP would be required to ensure that the instantaneous cumulative diversion rate does not result in a reduction in stream stage that is harmful to salmonids and would be required to include stream and diversion monitoring and reporting requirements. The number and location of stream stage monitoring gages would be established in consultation with the NOAA Fisheries Service and the California Department of Fish and Game. The WDMP would be required to be administered by a governing body capable of ensuring the goals of the program are met.

Thus described, the project purpose is too narrow because it constrains the alternatives analysis by identifying only one acceptable alternative, the proposed regulation in the Project Description. The SWRCB should reissue a NOP that includes a clear project purpose and objectives to give responsible and trustee agencies and the public the opportunity to provide a meaningful response to the significant environmental issues, reasonable alternatives and mitigation measures that should be considered in the EIR. Cal. Code Regs., tit. 14, §§ 15082, 15083. Such input is essential to ensure that the SWRCB prepares an EIR that “describe[s] a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives.” *Id.* § 15126.6(a).

A more appropriate project purpose and objectives can be gleaned from the Background, Section 1.0, which indicates that the SWRCB has embarked on a regulatory making process in order to regulate the effects of water diversions on salmonids during a frost event: “During a frost event, the high instantaneous demand for water for frost protection by numerous vineyardists and other water users may reduce the flow or stage in the Russian River stream system to levels that are harmful to salmonids”. The basic project purpose then should be to develop a program that minimizes the effects of diversions on salmonids during a frost event. Such a project description would not preemptively narrow the range of alternatives the SWRCB should consider

The project description is inadequate and as stated above the project purpose and objectives are defined too narrowly to solicit meaningful input. Similarly, the project description does not describe the proposed project description in sufficient detail to allow appropriately complete comments on the scope of the EIR. The project description should include meaningful descriptions of, “a reduction in stream stage that is harmful to salmonids” and what is defined as “hydraulically connected ground water”.

3.0 Project Location/Regulation Area

The Project Location is not adequately described. The NOP states that the regulation will cover a geographic area of the Russian River and its tributaries, an area that can be defined.

The regulation would also include “hydraulically connected groundwater”; however, this term is not defined. Not only is the term “hydraulically” relatively uncommon, typically “hydrologically” is used to describe connected groundwater, but the association between all connected groundwater and harm to salmonids is not made. It is not possible to identify the environmental impacts associated with and alternatives to regulating hydraulically connected groundwater without a definition for this term and an understanding of what wells will be subject to the regulation. A revised NOP must be issued to define hydraulically connected groundwater and the geographic area it is located.

Because the proposed regulation is concerned about the effects of water diversions on salmonid fishes, the Project Location should not include portions of the Russian River Watershed that do not support salmonids. At a minimum, areas above Coyote Dam (Lake Mendocino) and Warm Springs Dam (Lake Sonoma) are above the point of anadromy and are outside the areas of critical habitat for salmonids and therefore should be excluded from the regulation.

4.0 Reasonable Alternatives

The following alternatives to the proposed project and geographic area would satisfy the basic objectives of the project—to reduce the effects of water diversions on salmonids during a frost event—but in a manner that would avoid or substantially lessen significant effects of the project.

1. Recognize and provide technical support for existing non-regulatory diversion management programs, including the Russian River Frost Program, and the actions already taken to prevent recurrences of the stranding episodes identified by NMFS.
 - The grower-formed Russian River Frost Program and its Upper Russian River Stewardship Alliance (URSA) and Middle Russian River Stewardship Alliance (MRSA) have accomplished more through cooperative, non-regulatory efforts than the SWRCB can accomplish through regulation. URSA responded swiftly to concerns about salmonids stranding on the Upper Russian River by constructing offstream storage ponds that reduce peak demand by over 85 cfs, developing a water management protocol with Sonoma County Water Agency, and funding a new USGS stream gage. MRSA is working with Sonoma County to develop a county ordinance that requires that frost protection systems obtain a registration and fund a stream flow monitoring and reporting program. Since these efforts are locally-initiated by growers and directed to the specific needs within the watershed, they will operate more effectively than any regulation the SWRCB may impose from Sacramento.
 - Voluntary efforts directed to remediate demonstrated problems will be less costly and have less environmental impacts than a SWRCB regulation applicable to all water users within the Russian River watershed. In fact, the SWRCB proposed regulation does not discuss how actual problems would be remedied, only that “water diversion management programs” will be required.
2. Facilitate water right permitting actions for projects that reduce instantaneous demand.
 - This alternative may include the following actions to reduce instantaneous demand during the frost season:
 - Encouraging water users directly diverting surface water to install groundwater wells;
 - Encouraging and expediting the processing of water right permits for off-stream storage; and
 - Allowing direct diversion right holders (permitted and licensed, pre-1914, and riparian rights) to divert and regulate water in reservoirs or tanks for 90 days.
 - Projects directed to reduce instantaneous demand will be less costly and have fewer environmental impacts than a SWRCB regulation applicable to all water users within the Russian River watershed.
3. Rely on existing regulatory tools of the SWRCB, DFG, and NMFS to prevent the unlawful take of listed species.
4. Use the SWRCB’s reasonable use authority appropriately to make case-by-case determinations regarding the reasonableness of individual diversions.
5. Evaluate alternative regulations, including the following:
 - a. The proposal submitted to the SWRCB by the RRF in November 2009,¹ including a proposed regulation provided to the SWRCB. (Attachment A)

¹ Available at:

http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/russian_river_frost/comments111009/devon_jones.pdf

- b. The proposed regulation language submitted to the SWRCB by the RRF on March 30, 2010.²
 - c. A regulation that is applicable to all users of water during the frost season and that recognizes water right priorities.
 - o A regulation applicable to all users would be more equitable because all water users contributing to stream flow impairment, not just agricultural frost protectors, would be responsible for mitigating the effects of diversions.
 - o This alternative would be environmentally superior to the proposed regulation because non-frost diversions may have a greater adverse effect on stream flow and salmonids than frost diversions in some parts of the watershed.
 - d. A regulation that applies only to permittees and licensees diverting water during the frost season.
 - e. A regulation that applies only to tributary streams with significant diversions for frost protection and excludes the Russian River mainstem, Dry Creek mainstem, areas above Coyote Dam and Warm Springs Dam and tributaries without significant diversions for frost protection.
6. Adopt a hybrid of the alternatives above that includes non-regulatory options for an interim period (e.g., alternatives 1 and 2), evaluation of the effectiveness of the non-regulatory options, and adoption of a regulation (alternative 5) only in the event that the non-regulatory options do not adequately reduce instantaneous peak diversions during the frost season.

5.0 Probable Environmental Effects

The Proposed Regulation Will Have Significant Economic Impacts

The proposed Regulation would *prohibit* diversions for frost protection, unless it is in accordance with a water demand management program that prevents harm to salmonids. Since it is not clear whether or under what conditions the SWRCB will allow such diversions, the proposed Regulation must be analyzed as a complete ban. The SWRCB should consider:

- o The “Economic Impact of Frost Protection Regulation in California: Russian River Watershed” by Robert Eyley (Attachments B and C) as the best available information on the economic effects of a complete ban on frost protection.
- o The SWRCB has inappropriately prejudged the validity and applicability of this report. (See Attachment D)
- o The NOP suggests that growers may “choose to discontinue frost protection all together”. This choice is not a simple one to make when the damage level of a crop depends on the ability to frost protect.

² Available at:

http://www.swrcb.ca.gov/waterrights/water_issues/programs/hearings/russian_river_frost/docs/rrfrost_suugeste_drevised_4discussat0330meet.pdf

The Proposed Regulation Will Have Direct and Significant Environmental Effects

Although the NOP implies that any significant environmental impacts will be indirect, this will not be the case. The following impacts will directly result from the proposed regulation:

- Switching to a different method or combination of methods of frost protection such as installing wind machines, heaters, or non-interconnected groundwater wells, or employing helicopters.
- Constructing new off-stream storage reservoirs to store water diverted prior to the frost season for later use for frost protection.
- Crop conversion
- Land use conversion
- Loss of habitat if agricultural lands and open space are converted to other uses

Merely because there are several different actions a landowner may take in response to the regulation does not render those actions indirect. The SWRCB has in fact enumerated a number of actions that will predictably and directly be caused by the proposed Regulation; consequently the effects of those actions must be analyzed as accurately as possible.

Mitigation Measures That Should be Considered

- Excluding the mainstem of the Russian River from the regulation since instantaneous demand issues seen in 2008 related to frost diversions have already been resolved. There is no need to endure the environmental effects of a regulation if no additional issues have been identified.
- Excluding streams above Lake Sonoma and Lake Mendocino. These diversions are above the point of anadromy and Lake Sonoma and Lake Mendocino are operated to maintain minimum instream flows downstream.
- Excluding diversions from groundwater. Pumping groundwater does not result in an instantaneous effect on stream flow, and should be encouraged as a tool for reducing peak surface water demand during frost events.
- Adopting specific well diversion criteria to replace the vague, undefined phrases “hydraulically connected groundwater” and “interconnected groundwater”. If the regulation were to apply to any groundwater use, it should only apply to specific types of groundwater pumping that contribute to rapid changes in stream flow, such as shallow wells in alluvium immediately adjacent to stream channels. Tailoring criteria to specific groundwater uses proven to affect stream flow will reduce the geographic scope of the groundwater resources subject to regulation, and therefore the environmental impacts of the regulation.
- Having a program of phased implementation such that the regulation applies to a stream or watershed only after the SWRCB has conducted a study demonstrating that regulation of diversions from that stream or watershed is necessary to protect salmonids.

Specific Comments Regarding Environmental Effects

Aesthetics

If the ability to use water for frost protection is prohibited or limited, there will be a significant level of crop loss. Depending on the extent of the damage, vines may not recover and will need to be removed resulting in barren land. Depending on market conditions and economic impact, lands may not be replanted and will remain fallow. Properties may also be sold to development where applicable which would result in loss of open space and create urbanization (houses, light pollution, etc) and should be analyzed as an aesthetic impact.

In certain topographies within the Russian River Watershed, mostly in Sonoma County, where alternative non-water frost protection methods are applicable and effective, there will be an increase in the installation of wind machines which will result in aesthetic impacts and should be analyzed.

The additional construction of off-stream reservoirs for water storage will be necessary to offset instantaneous demand associated with frost protection. If a complete moratorium on water use for frost protection does not materialize, then additional off stream storage ponds will be constructed which could be an aesthetic impact and should be analyzed.

Agricultural Resources

If the ability to frost protect with water from the Russian River watershed is prohibited or limited, there will be a number of vineyards that will experience crop loss. Depending on the severity of the loss and potential for future loss, management decisions will be made as to whether to remain with wine grapes as a commodity. Farming is a business and like any other business, economic balance is a critical component. If the inability to frost protect with water leads to substantial crop loss and related negative financial impacts, then there is a strong likelihood that alternative land uses will be considered.

Crop conversion is not an easy task and any commodity that is planted is market driven. So even though alternative more frost resistant crops exist, it does not mean that there is a viable market for those crops. If there is no market, then it does not make economic sense to convert to alternative crops. In addition, the NOP should consider that wine grapes are extremely water efficient with irrigation water use during the summer months when flows in the Russian River watershed are low or non-existent. The high water demand for wine grapes is during the winter frost season when flows are normally high in the Russian River watershed. Converting to crops with a lower frost risk will most likely translate into an increased irrigation demand which in turn will increase the need for agricultural water during low flow times of the year. This is counterproductive to the goal of protecting the fishery and could result in additional impacts to salmonids and the need for another set of regulations over the use of irrigation water. Urban water use also peaks in summer months creating two major demands on the water supply during the low flow season. The SWRCB needs to analyze the impacts to crop rotation on the overall water use within the Russian River watershed.

Another alternative land use is conversion of agricultural lands to residential, commercial, industrial or mixed use. Agricultural land owners that have the ability to subdivide properties may opt to take advantage of that option if farming is no longer economical. This option will not benefit the overall goal of protecting the fishery or the watershed as water use demand for developed purposes may exceed the water demand of the current agricultural uses. The SWRCB needs to analyze the impacts of agricultural land development and related water use.

Air Quality

Replacing water as a frost protection method with alternative methods of frost protection will have direct effects on air quality. Heaters and diesel engines required for wind machines use fuel sources and if there is increased use of these alternatives for frost protection, then there will also be an increase in the use of fuels. Some engines used for wind machines are electric which would result in increased electricity use. The SWRCB needs to analyze the effects of increased fuel use and related greenhouse gas emissions with alternative frost protection methods.

If wine grapes are removed and more intensely cultivated crops are planted, there is a potential impact to air quality with increased dust particulate. There may also be an increase in the use of pesticides for various alternative crops that could affect air quality. The SWRCB needs to analyze the impacts to air quality related to conversion of agricultural crops.

If agricultural lands are converted to developed uses, there will most likely be an impact to air quality and this need to be analyzed in the EIR.

Biological Resources

If wine grapes are removed and lands are left fallowed, this will be a loss of habitat to a number of bird, mammal, insect, reptile and plant species. The same negative effect will be seen with a loss of habitat and open space if agricultural lands are developed. The impacts of development of agricultural lands on biological resources should be analyzed.

Cultural Resources

The rural communities in the Russian River watershed will be adversely impacted by the regulation and this should be analyzed. A number of people directly dependent on the agricultural industry in the Russian River watershed for employment may be displaced. A number of local governments and businesses would also be impacted. See Attachments B and C.

Geology and Soils

Rotating to other crops could lead to increased soil tillage, possible erosion and loss of topsoil. This should be analyzed.

Hazards and Hazardous Materials

Rotating to other crops may lead to increased use of pesticides and other agricultural chemicals and should be analyzed.

Hydrology and Water Quality

Rotating to other crops could lead to increased soil tillage, possible erosion and loss of topsoil which could affect water quality.

Converting agricultural lands to more intensive developments could affect existing drainage patterns, contribute to storm runoff water and lead to erosion issues. This should be analyzed.

Rotating to other crops may lead to increased use of pesticides and other agricultural chemicals and should be analyzed.

Land Use and Planning

See comments regarding agricultural resources.

Noise

Converting agricultural lands to more intensive developments could affect existing noise pollution levels depending on the type of development and should be analyzed.

Utilities and Service Systems

The EIR must explain how the proposed regulation will impact water delivered under contract with the various municipalities that serve agricultural water users in the Russian River watershed. This should be analyzed.

Sincerely,

Devon Jones
Mendocino County Farm Bureau

David Koball
Fetzer Vineyards

Laurel Marcus
California Land Stewardship Institute

Lex McCorvey
Sonoma County Farm Bureau

Pete Opatz
Silverado Premium Properties

Doug McIlroy
Rodney Strong Vineyard

Sean White
Mendocino County
Russian River Flood Control &
Water Conservation Improvement District

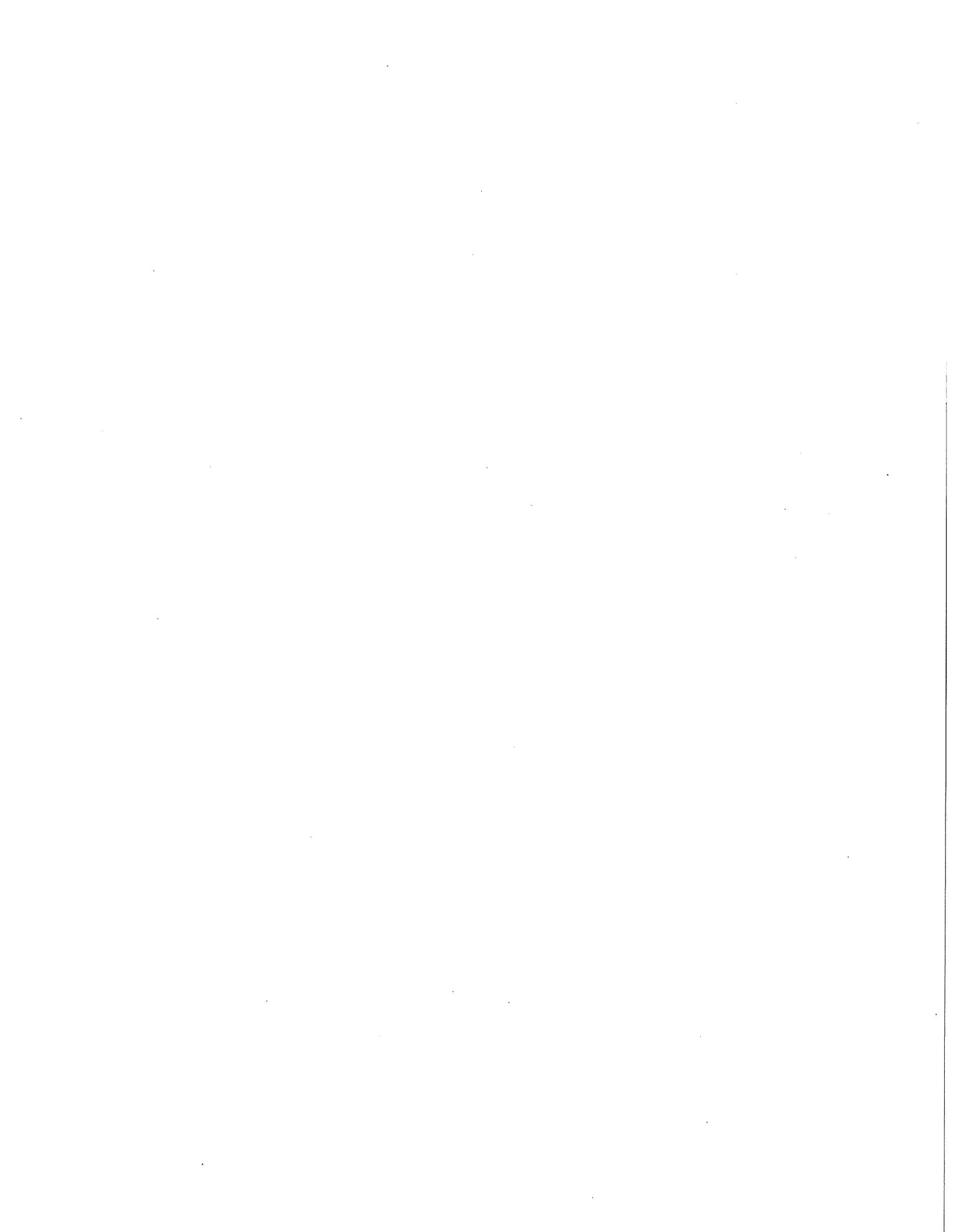
Encls: Attachment A: Russian River Frost Policy – Discussion Draft

Attachment B: Economic Impact of Frost Protection Regulation in California: Russian River Watershed

Attachment C: Errata Sheet for Economic Impact Report

Attachment D: North Bay Business Journal Article – *Study estimates impact of proposed frost rules to top \$2 billion*

Attachment A



RUSSIAN RIVER FROST POLICY
Discussion Draft

FINDINGS

1. Budding grape vines and certain other crops in the Russian River watershed may be severely damaged by spring frosts (generally March 15 to May 15). Water application is the most common and effective method of protecting new growth on grapevines from frost in the low lying regions in the Russian River watershed. Water is the only feasible method for reliably protecting vines against frost damage.
2. The economies of Sonoma and Mendocino County in general and of the wine industry in particular would suffer tremendous losses if vineyards were prevented from using water for frost protection.
3. During a frost and particularly during low flow periods, the high instantaneous demand for water for frost protection may cause a rapid change in stream stage.
4. In the spring of 2008, the Russian River was in a second year of drought. March 2008 was the driest March on record with no rainfall. Freezing temperatures occurred on 20 nights in late March and early April, requiring frost control measures to protect new growth on grapevines in low-lying valley areas. The 2008 frost season was the worst frost season in over 30 years. Typical frost events are radiation frosts where cold air sinks to low-lying areas and these areas are subject to frost damage. Advective frost events occur when a large air mass with freezing temperatures moves into a valley and frost damage occurs both in low-lying areas and on hillsides. Large areas of the Upper and Middle Russian River Watersheds are subject to severe frost temperatures of 27°F.
5. The National Marine Fisheries Service ("NMFS") in a February 2009 letter to the State Water Board alleges that two instances of salmonid stranding mortality on Felta Creek and on the mainstem Russian River near Hopland in 2008 were related to direct diversions for frost protection.
6. Grape growers and regional conservation, agricultural and water user groups have formed the Russian River Frost Program, a cooperative effort to address frost protection for the Upper and Middle Russian River Regions. The Program will reduce changes in stream flows from diversions for frost protection by implementing conservation actions that reduce instantaneous demand. Conservation actions include projects that reduce the volume of water used for frost control and projects that change the manner in which water for frost protection is obtained. The Program uses a watershed based approach to monitoring directed by an independent Science Advisory Group. Watershed based monitoring will examine a variety of factors affecting stream flows including factors other than diversions for frost protection. Focused monitoring will therefore allow the Frost Program to direct its conservation actions to provide the greatest benefit to stream flow. The Science Advisory Group will provide direction and input regarding the factors to investigate and monitor and the selection of protocols for conducting such inquiries. The Science Advisory Group will evaluate the overall effectiveness of the Russian River Frost Program.
7. Water management actions have already been implemented to address the diversion-related factors alleged to have contributed to the two episodes of frost diversion-related stranding mortality. The Russian River Frost Program and cooperators implemented the following conservation actions to address frost water management affecting the mainstem Russian River: Pumping Coordination Protocol between Sonoma County Water Agency and Russian River Flood Control District (RRFC); funding for a new USGS gage at Talmage; enhanced phone-in frost forecasting system; installation of telemetric meters for RRFC customers; created a program of BMPs to conserve water through changes in frost methods and infrastructure and a BMP implementation verification process; and construction of new offstream storage ponds that will

reduce direct diversion demand by 87 cfs. For the tributaries, the Russian River Frost Program and cooperators helped the Felta Creek diverter to replace instream frost pump with an offstream pond recharged by a groundwater well, created a program of BMPs to conserve water through changes in frost methods and infrastructure and a BMP implementation verification process, and started tributary frost assessments on 15 tributaries.

8. The Russian River Frost Program made a presentation of the features of this program to the Board at the Board's November 18, 2009 Frost Protection Public Workshop.
9. The Russian River watershed is a variable and complex physical system. There is no uniform solution for frost protection that will work for every diverter in the Russian River watershed.
10. The Board finds that the Russian River Frost Program offers a feasible and practical approach for addressing frost protection issues in the Russian River watershed. The Board also finds that the Russian River Frost Program is likely to provide an environmental benefit more quickly and at less cost than the Board could accomplish through regulation of individual diversions.

POLICY STATEMENT

It is policy of the Board to encourage methods of frost protection that reduce the direct diversion of surface water from streams including the diversion of water from wells and from reservoirs, and to identify criteria for reducing the instantaneous effects of direct diversions on stream flow.

It is the policy of the Board to expedite review and approval of petitions to change existing water right permits and licenses and applications for new water right permits where the petition or application will facilitate reduction of the instantaneous peak demand for water during frost events.

It is the policy of the Board to support cooperative efforts by grape growers to address frost protection effects as an alternative to regulation of individual water diversions by the Board.

The board shall implement this policy by commencing a public rule making process to accomplish the following: expedite review and approval of petitions to change existing water right permits and licenses and applications for new water right permits to change the manner and timing of diversion; encourage direct diverters to participate in a regional frost protection program; and establish guidelines for diverters who do not participate in the Russian River Frost Program.

POLICY IMPLEMENTATION

(a) **Concise Summary of Findings and Policy.** Budding grape vines and certain other crops in the Russian River watershed may be severely damaged by spring frosts (generally March 15 to May 15). Water application is the most common and only feasible effective method of reliably protecting new growth on grapevines from frost in the low lying regions in the Russian River watershed. During a frost and particularly during low flow periods, the high instantaneous demand for water for frost protection may cause a rapid change in stream stage. It is policy of the board to encourage methods of frost protection that reduce the direct diversion of surface water from streams including the diversion of water from wells and from reservoirs, and to encourage cooperative efforts to manage diversions for frost protection. The board shall implement this policy by: expediting review and approval of petitions to change existing water right permits and licenses and applications for new water right permits to change the manner and timing of diversion; by encouraging direct diverters to participate in a regional frost protection program; and by establishing guidelines for diverters who do not participate in a regional frost protection program.

(b) **Expedite Approvals.** The board shall expedite review and approval of petitions to change existing water right permits and licenses and applications for new water right permits where the petition or application will reduce the instantaneous peak direct diversion demand for water during frost events, including but not limited to: change a direct diversion from a stream channel to a diversion of surface water by well; change a direct diversion to a diversion of surface water to offstream storage; expansion of storage; addition of new offstream storage; and addition of new season of diversion to offstream storage.

(c) **Diverters Participating in Russian River Frost Program.** The board recognizes the Russian River Frost Program is a feasible and practical approach for addressing frost protection issues in the Russian River watershed. Commencing in 2010, water users diverting water for frost protection in the Russian River Region may demonstrate compliance with this regulation by participating in the Russian River Frost Program, as described in the November 10, 2009 program summary, and as may be revised in the future in consultation with the Board. The Russian River Frost Program shall provide the board with a 2010 implementation plan by February 15, 2010, consult with the board and other resource agencies during the 2010 frost season, and provide a report on the effectiveness of Program following the 2010 frost season. The board will evaluate the effectiveness of the Program after the 2010 frost season and may recommend changes to the Program. The Program will provide annual reports to the board thereafter.

(d) [version d1] **Technical Process to Develop Guidelines for Diverters Not Participating in Russian River Frost Program.** The board shall convene a public technical process for developing recommended guidelines to address instantaneous rates of direct diversions of water for direct application and for reservoir refill for frost protection purposes for diverters not participating in the program defined in subsection (c).

(d) [version d2] **Guidelines for Diverters Not Participating in Russian River Frost Program.** The board recommends that the direct diversion of surface water for direct application or reservoir refill for frost protection purposes from the Russian River watershed from March 15 to May 15 conform to one of the following guidelines:

(1) Diversion from the mainstem Russian River and mainstem Dry Creek that is coordinated with Sonoma County Water Agency and Russian River Flood Control and Water Conservation Improvement District to ensure flows in the mainstem Russian River and mainstem Dry Creek meet or exceed any

applicable minimum flow requirements that Sonoma County Water Agency and Russian River Flood Control and Water Conservation Improvement District are required to maintain; or

(2) Direct diversion from a tributary stream where the diversion for a single frost protection event is not predicted to [ver 2a - cause a substantial dewatering of the wetted stream bed within 48 hours of diversion] [ver 2b - cause a reduction of stream stage greater than the natural diurnal fluctuation in stage at the point of diversion within 48 hours of diversion] [ver 2c – cause a change in stage no greater than (*X rate, unit, etc.*) per hour].

(e) **Groundwater.** The use of percolating groundwater for frost protection is not subject to this regulation.

(f) **Enforcement.** Frost diverters who do not participate in the program defined in subsection (c) or conform to guidelines in subsection (d) may be subject to enforcement proceedings.

Attachment B



**Economic Impact of Frost Protection Regulation in California:
Russian River Watershed**

Final Draft

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Executive Summary

This study concerns a new regulation that would restrict vineyards from using the Russian River as a source of frost protection water. Because thousands of vineyard acres in Sonoma and Mendocino counties use the Russian River, its tributaries and connected groundwater for frost protection, a regulation to restrict this water's use would affect the entire California economy. In a recent study by the Wine Institute, the economic impact of the California Wine industry was shown to be over \$100 billion annually, of which Sonoma and Mendocino counties represent about 25 percent. This regulation would affect both wealth and income. Income would be lost due to reduced revenues and yield in vineyards, fewer employees, and decreased wages earned across the wine industry's distribution chain. Wealth would also be lost due to changing land values and a reduction in the return to capital investments, such as rootstock and current irrigation infrastructure.

This regulation would act like a tax on vineyard farmers, wineries and many allied industries, including tourism. The economic effects on wine vineyard farmers would include increased costs of frost protection, forcing investment in another frost protection method, such as wind. Wind or other frost-protection methods may be so much less effective that farmers could lose crops or even their livelihoods.

The Many Industries Affected

While this regulation may seem like a simple initiative to protect a natural habitat, the regulation would have far-reaching effects beyond vineyards. Wineries would be heavily

affected, in part because many wineries in Sonoma and Mendocino counties have vineyards. Industries such as glass companies, barrel coopers, trucking, docks, vineyard nurseries, hotels and restaurants, grocery stores, and many more are also affected. Approximately 900 jobs in industries unrelated to the wine industry in their everyday business would be lost because of this regulation. Over 8,000 jobs would be lost in these two counties in vineyard and winery businesses with just a 10% crop loss. Higher losses in crop production, such as during an advective type frost against which only water is effective, magnify job losses; over 26,000 jobs may be at stake if annual crop losses are 30% of their current levels.

Tax Revenue Lost

Regulation is meant to provide society with benefits, or to protect our natural environment against rising social costs. The social cost of this regulation outweighs its benefits. Over \$142 million in annual local and state tax revenue would be lost due to this regulation, even when considering the positive mitigating effects of equipment sales and installations. Because the wine industry pays taxes throughout its distribution chain and is tied to a large amount of tourism that comes to the state of California, taxes such as transient occupancy tax (TOT) and sales taxes would be lost. There would also be millions in decreased tax revenue because of job losses and lost business revenues and associated profits.

Land Values Reduced

Land values would also fall as a result of this regulation. Sonoma and Mendocino counties are world-class, grape-growing regions. The land value is a major marketing input as well as in the correct geography to drive revenues and jobs for Californians. This regulation would increase

the cost of using the land to its market-driven, best potential because it targets a specific use of water and a specific geography, which ultimately targets a specific type of business: small, vineyard farms that employ many workers at medium to low wages. As farmers attempt to reduce their property tax bill to reduce costs, there is a further social cost of this regulation. This report, using a 10% crop loss assumption, estimates over \$113 million in lost land values over the next five years in Sonoma and Mendocino counties, which would compound the devastating effects of a recession that has not ended. With the complete prohibition of the use of frost protection water, the losses in land value could easily exceed \$340 million.

The Costs Overall

The regulation could cost California over \$2.1 billion in lost business revenues annually, as well as over \$143 million in annual tax revenue lost to local governments and Sacramento, assuming 10% crop losses. If crop losses reach 30%, the losses would total over \$6.7 billion in business revenues and \$450 million in taxes. These estimates, based upon a 10% crop loss, include the mitigation of all farmers converting from frost-protection water to frost-protection wind, and paying full price for wind and monitoring equipment. If the crop or business losses are more significant, the mitigation is smaller and the costs rise further. Land values that are already in freefall from the real estate bubble bursting will fall further specific to vineyard land. Table EX - 1 summarizes the economic impacts of a 10% crop loss; Table EX-2 summarizes the economic impacts of a 30% crop loss. If there were 30% reduction in yields due to the regulation, the losses would be approximately three times the 10% losses, assuming the allied industries in these counties were able to remain stable in the face of these losses.

Table EX-1: Sonoma and Mendocino Economic Impact from Regulation, 10% Crop Loss

Category	Lost Jobs	Lost Business Income (Annual)	Lost State and Local Taxes (Annual)
Due to Vineyard Losses	948	\$106,010,648	\$2,867,744
Due to Winery Losses	7,391	2,098,294,381	141,047,166
Due to Tourism Losses	384	44,992,730	2,959,372
Due to Allied Industries Losses	524	51,425,678	3,578,438
Mitigation* (Wind/Monitoring Equipment)	+1,110	+173,951,579	+7,435,770
Totals (lost jobs and annual \$)	8,137	\$2,126,771,858	\$143,016,950
		Lost Value	Lost Property Taxes
Lost Land Value		\$113,697,867	\$1,250,677

***Assumes no farmers go out of business before they convert frost protection to wind**

Table EX-2: Sonoma and Mendocino Economic Impact from Regulation, 30% Crop Loss

Category	Lost Jobs	Lost Business Income (Annual)	Lost State and Local Taxes (Annual)
Due to Vineyard Losses	2,845	\$318,031,943	\$16,617,905
Due to Winery Losses	22,174	6,294,883,144	423,141,499
Due to Tourism Losses	1,154	\$134,978,190	\$8,878,116
Due to Allied Industries Losses	1,573	154,277,034	10,735,314
Mitigation* (Wind/Monitoring Equipment)	+1,110	+173,951,579	+7,435,770
Totals (lost jobs and annual \$)	26,637	\$6,728,218,732	\$451,937,064
		Lost Value	Lost Property Taxes
Lost Land Value		\$341,094,000	\$3,752,000

***Assumes no farmers go out of business before they convert frost protection to wind**

Economic Impact of Frost Protection Regulation in California: Russian River Watershed

Introduction

This study concerns a proposed new regulation that would restrict the ability of vineyards and wineries from using the Russian River watershed as a source of frost protection water. In brief, the potential loss of special status salmonid species and their habitat is the driving force behind this regulation. Because thousands of vineyard acres in Northern California use the Russian River, its tributaries and connected groundwater for frost protection, a regulation to restrict this water's use would affect the entire California economy. In a recent study by the Wine Institute, the economic impact of the California Wine industry was shown to be over \$100 billion annually, of which Sonoma and Mendocino counties represent about 25%. It is important to recognize that both income and wealth would be reduced by this regulation if it passes. Incomes would be lost due to reduced tonnage and yield and fewer employees across the distribution chain. Wealth would be lost due to changing land values and a reduction in the return to capital investments, such as rootstock and irrigation infrastructure.

This regulation would act like a tax on vineyard farmers, wineries and the wine industry. Economic impact studies begin with the directly affected industries. For vineyard farmers, there would be increased costs of frost protection. Farmers would have to potentially remove current capital used for frost protection, if different from other irrigation, at some cost. An associated increase in costs would be the investment in another frost protection method. In some cases, wind and other frost protection methods will be less effective or totally ineffective such that a farmer will no longer have a viable grape crop or business. Those farmers that can afford to make a frost protection capital switch, and for whom the new method is effective,

may be unable to afford as many workers; thus the number of jobs and incomes for vineyard workers are reduced as a direct effect. Also, vineyard land will decline in value due to a reduced viability of vineyard and reduced yields from a change in frost protection methods. These direct effects lead to indirect and induced effects that spread across all of California, from reduced trucking and logistics jobs, to fewer sales people for wineries with reduced winegrape availability, to lower revenues from retail wine sales.

Applying this regulation only to the Russian River watershed would not keep the economic effects from being statewide. The State Water Resources Control Board staff (SWRCB) proposes to include in the regulation the entire Russian River stem, all of its tributaries, and also what it considers to be "closely connected groundwater." Any mandated change in how a farm runs acts like a new tax. Farmers would have a cost imposed upon them based on the new regulation, and that cost would be partially passed on to the winery and consumer. Lost net revenue (both reduced revenue and increased costs) to farmers triggers larger, widespread effects on the California economy; the direct effects will be in the Sonoma, Mendocino and Napa county economies (the sum of reduced revenue and increased costs to growers). The larger effects include lost jobs, incomes, and tax revenues. This study's objectives are to:

- Describe the regulation and its economic effects on vineyard owners and California's economy;
- Describe the limits of other frost protection methods and a range of lost net revenue in cases where temperature inversion makes a wind machine and other methods less effective or completely ineffective;

- Describe briefly the other methods currently employed in the Russian River Watershed vineyards and their average costs;
- Estimate the proposed regulation's net revenue effects as a mandated increase in the cost to vineyard owners to switch from water-based frost protection to other methods;
- Estimate the farm value of lost crops from a freeze that non-water protection cannot mitigate;
- Estimate the lost net revenue as a result of grape shortages affecting the supply chain (wineries, retailers, restaurants) throughout California;
- Estimate the tax impact on Sonoma and Mendocino Counties and also California from a reduced amount of wine sold, reduced land values, and reduced sales and use taxes from the winery through the supply chain;
- Estimate lost land value from the vineyard land becoming less viable as vineyard due to frost protection restrictions and the lack of an alternative market for the land, much of which is in a flood plain;
- Estimate the tourism impacts on Sonoma and Mendocino Counties and also California from reduced wine production and the loss of vineyards and wineries due to increased costs in frost protection, loss of Russian River grapes and wine, and a lack of suitable alternatives;
- Provide a specific impact analysis on small businesses, specifically vineyards and wineries with fewer than 50 employees (which constitutes most of the wineries in the affected counties);

- Conduct the larger economic impact analysis on the California economy, where the purchase of new frost protection devices and services acts as a mitigating factor in the overall losses; and
- Provide conclusions and policy recommendations.

The Regulation and its Economic Effects

The regulation is a reaction to two alleged strandings of salmonid fish protected under the Endangered Species Act in the Russian River Valley. Regulators claimed that when vineyard owners turned their pumps on at the same time during a frost event, that it resulted in an instantaneous drop in water elevation in the Russian River, or its tributaries, that stranded these fish in small pools incapable of sustaining fish life. To address this, the original draft of the regulation declares that all “significant” diversions of water from the Russian River stream system, including “closely connected groundwater,” for purposes of frost protection shall be considered to be unreasonable and a violation of law, unless the water is diverted pursuant to a SWRCB approved water management program. The SWRCB goes on to define “significant” as any diversion of water, unless the diverter can establish to the satisfaction of the SWRCB the diversion will have a “negligible” impact on river flows.

Thus, upon passage of this regulation, all diversions of surface water from the Russian River stream system, and groundwater near the Russian River stream system, for purposes of frost protection will become illegal. The only way to continue to divert surface water or groundwater for purposes of frost protection will be to participate in a SWRCB “approved” but otherwise undefined “water demand management program.”

The regulation has been criticized as overbroad and ill-defined as it issues a complete prohibition on using water for frost protection unless and until a water management program is approved by the SWRCB. No assurances are given when the SWRCB might approve such a program, or even what the required components of a program might be, other than it must provide monitoring and reporting data on water diversions and stream flow every hour to the SWRCB. Thus, it is entirely possible it could take years for the SWRCB to better define, approve, and supervise a program. The only way out of the regulation is to prove to the SWRCB that a diversion has a "negligible" impact on flows, which term is equally undefined in the regulation and which could take years for the SWRCB to resolve.

Even if it does not take years to resolve these questions, the proposed water management system's costs would inevitably fall in the form of supplemental taxes on landowners who are assumed to be users. The draft regulation does not differentiate between those that have reservoirs and those that do not, nor does it target specific sections of the Russian River where water diversions are most likely to be detrimental to fish habitats. In fact, this regulation may affect landowners and firms far beyond the Russian River flow due to its large watershed. The numbers of acres that are frost protected in Mendocino and Sonoma County are significant: 17,194 acres in Mendocino County (which accounts for all their planted acreage), and 13,858 acres in Sonoma County based on a recent Sonoma County Farm Bureau survey. If 10% of vineyard farm revenue was lost due to the regulation and the cost of the regulation fell completely on the vineyard farmers as private firms, the following costs would be only the beginning of the economic effects of the regulation:

- One-time cost to install water meters at each Russian River diversion
- One-time cost to include satellite telemetry for each water meter
- One-time cost to install flow gages and telemetry stages on all major and minor tributaries
- Annual maintenance and debt service cost of monitoring system
- Debt service and one-time costs of purchasing and installing wind machines to reduce water demand for frost protection
- Lost revenue (estimated as 10% of five-year average in Sonoma and Mendocino counties) to vineyard farms due to conversion from frost protection water to wind
- Similar estimates for 30% losses in years with advective frost events or farms where wind is partially effective.

The Economic Effects of the Regulation to the Wine Industry

Though Sonoma and Mendocino Counties would be the epicenter of this regulation's effects, the costs on other industries directly allied with the wine industry would be significant¹.

Categorically, this regulation has three levels of direct economic effects on the wine industry:

- Vineyard farms, farmers and employees
- Winery businesses and employees
- Allied industry businesses and employees as identified in other studies.

Because of the three-tier system of distribution in California (as in most US States), fewer winegrapes harvested would likely increase wine prices to retailers and restaurants. Consumers that do continue to buy California wine will experience a "deadweight loss", where the regulation (because it really means a larger cost of final goods due to a larger cost of inputs

¹ The Wine Institute's "Economic Impact of the California Wine Industry" from 2000, 2004, and 2007 identify specific industries that have a portion of their business dependent upon the wine industry. As a result, if the wine industry were to contract by any amount, these allied businesses, including tourism in Sonoma and Mendocino counties would also lose revenue, jobs and contribute fewer taxes to local and state governments.

for producers artificially imposed by the government) acts like a tax. Foreign competition will be enhanced by this regulation of California wineries. Foreign wineries will not face the same cost as their California competitors and may take advantage of that as wines from Sonoma and Mendocino counties rise in price. At a time where competition is fierce and prices are falling due to a recession-driven slowdown in demand, this regulation would likely cause the failure of both vineyard and winery businesses based in California.

The net economic impacts of this regulation depend on the cost to vineyards in conforming to the restricted use or inability to use current frost protection methods. The next section provides a background on frost protection methods currently used, other methods available, and cost differentials. These cost differentials are the key to the economic impacts.

Sonoma and Mendocino Counties in California's Wine Industry

Most of the effects of this regulation are not on the farmers, landowners and businesses that will face new costs and reduced productivity. The effects will ripple into the greater California economy across many counties and most of the state. Sonoma and Mendocino represent a relatively large portion of the overall and premium wine industry in California. In terms of acreage, these counties represent approximately 15.7% of bearing and non-bearing acreage and over 26.5% of the current vineyard land values in California. Napa County vineyard land, for example, is approximately 9.6% of acreage and 24.1% of the land value in California. In combination, tables 1 and 2 show the acreage and approximate land values for vineyard land in California.

Table 1: Vineyard Acreage in California, 2009

County	2009 Acreage	% of total
San Joaquin	71,260	15.1%
Sonoma	57,149	12.1%
Napa	45,401	9.6%
Monterey	42,259	8.9%
Fresno	41,425	8.8%
Madera	36,495	7.7%
San Luis Obispo	30,258	6.4%
Kern	21,070	4.5%
Sacramento	19,645	4.2%
Santa Barbara	17,566	3.7%
Mendocino	17,194	3.6%
All Others	73,594	15.6%
California	473,316	100%

Source: National Ag Statistical Service (NASS)

Table 2: Approximate Vineyard Land Values

County	2009 Values (\$000)	% of total
Napa	\$ 1,348,880	24.2%
Sonoma	1,297,135	23.2%
San Luis Obispo	577,900	10.3%
Monterey	525,840	9.4%
San Joaquin	456,400	8.2%
Mendocino	207,880	3.7%
Santa Barbara	207,390	3.7%
Fresno	166,898	3.0%
Madera	97,070	1.7%
Kern	79,838	1.4%
Lake	51,150	0.9%
All others	285,534	5.1%
California	\$5,584,250	100%

Source: Wine Institute and USDA

Crop Value and Links to Allied Industries

Since 2000, the Wine Institute has commissioned studies to estimate the impact of the wine industry on California's economy. There have been four in the series, where 2007 and 2009

were updates of the 2004 study specifically (the initial study was done in the year 2000). One of the main findings of these studies is the number of allied industries without which the California wine industry would not have as large an impact as was estimated in 2009: over \$121 billion per year. The synergy that exists between vineyards and wineries drives gains because bottled wine is a value-added agricultural good that produces export income and drives tourism. The links to other industries do not stop with the allied industries; the economic impact of vineyards and wineries is felt throughout unrelated industries due to the spending done by the workers in these wine-based businesses. These indirect and induced impacts are shown as part of the economic impact analysis below.

For the vineyard owners, the value of grapes has been a driving force in profitability and stability of these farms. Table 3 shows the value of purchased grapes for Sonoma and Mendocino counties and summarizes the remainder of the state except for Napa County. These data come from the National Agricultural Statistical Service (NASS), but are in a slightly different form than the acreage reports². In 2009, Mendocino represented 2.8% of the winegrape value in California, while Sonoma was 15.5% of California. Mendocino and Sonoma, Russian River watershed districts, generated more than \$300 million in combined vineyard revenue in 2009.

² The revenue data as reported for winegrape transactions are in “pricing districts”, and not by county. For our purposes, the only difference is that Sonoma and Marin counties are combined, where Marin is an insignificant amount of this pricing district’s data.

Table 3: Purchased Grape Crush Crop Value for Vineyards, 2000 – 2009, \$000

Year	Mendo	Sonoma	Napa	All Other Counties	California
2000	\$72,951,000	\$272,609,000	\$220,161,000	\$1,000,053,000	\$1,565,774,000
2001	74,611,000	269,815,000	231,665,000	916,751,000	1,492,841,000
2002	64,385,000	250,044,000	226,062,000	783,342,000	1,323,833,000
2003	54,601,000	200,599,000	225,287,000	754,411,000	1,234,898,000
2004	45,949,000	208,729,000	211,456,000	847,461,000	1,313,595,000
2005	53,500,000	276,319,000	298,096,000	1,156,264,000	1,784,179,000
2006	62,235,000	272,789,000	245,433,000	928,945,000	1,509,403,000
2007	54,934,000	268,137,000	252,901,000	967,963,000	1,543,935,000
2008	46,971,000	247,824,000	224,548,000	1,072,383,000	1,591,725,000
2009	\$53,234,000	\$293,864,000	\$262,867,000	\$1,281,124,000	\$1,891,089,000

Source: NASS, 2010

In terms of jobs, the following tables and charts provide an overview of comparisons and data for the vineyard and wine industry in California. The important idea here is in Table 4, which provides the number of allied industry jobs in California from the Wine Institute studies. Those employment figures, along with the updated figures for vineyard, winery and tourism jobs specifically, provide the data to demonstrate the greater impacts to California's economy as a result of this regulation. The Wine Institute studies assume that if the wine industry did not exist in California, these industries would lose these jobs because they would not have the California wine industry to service. The proposed regulation's impact on tourism will be covered in later analysis.

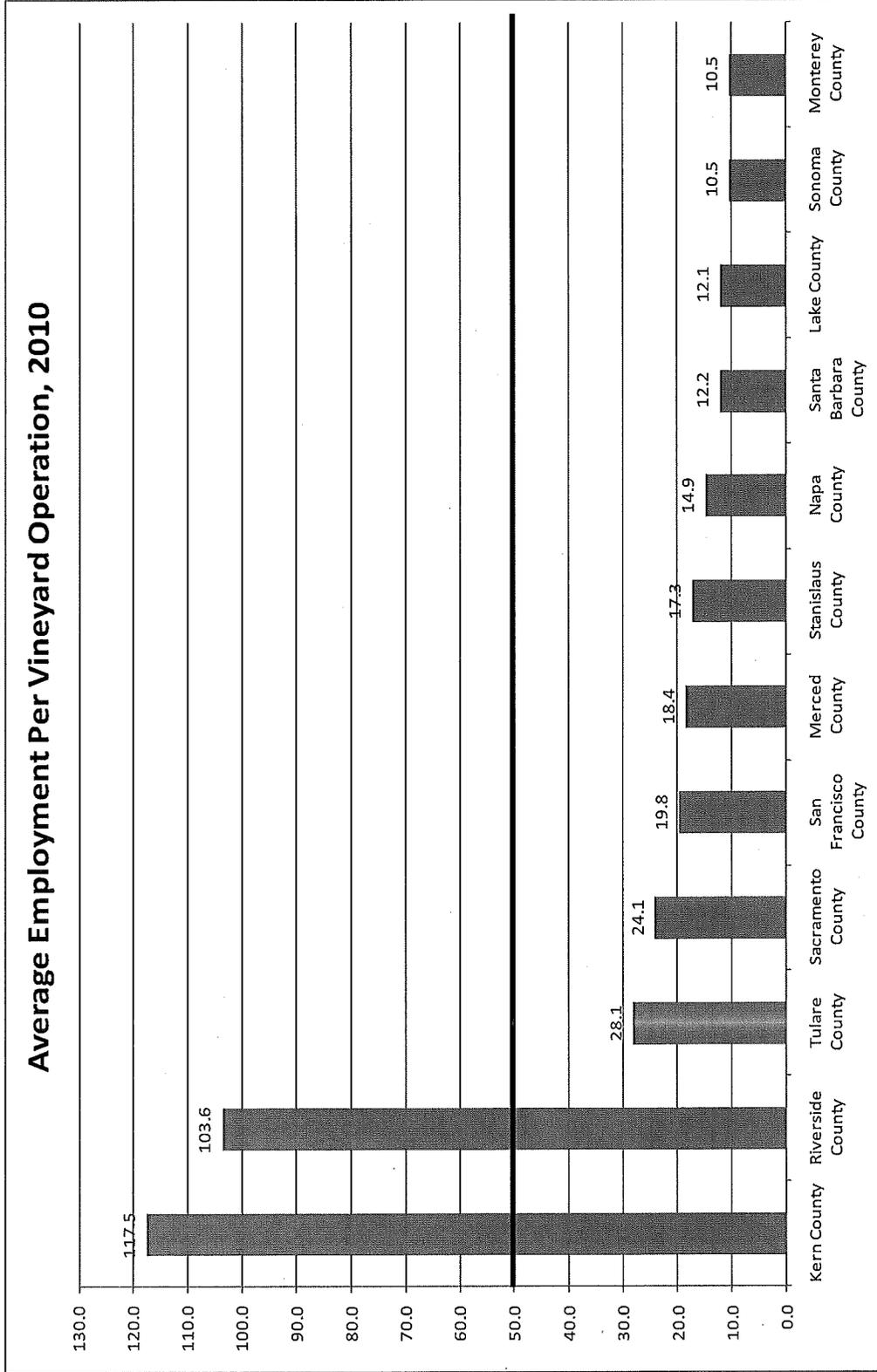
Table 4: Allied Industries and 2009 Job Estimates, California

Sector	Est. 2009
Boxes/Inserts and Bags	747
Cooperage	201
Corks/Caps/Screwtops	49
Distributor	2,487
Education and Research	80
Glass Bottles	1,245
Labels	1,210
Grapevine Nurseries	1,006
Grapevine Assessments	22
Retail/Liquor/Grocery	16,381
Restaurants	43,830
Stainless Steel	250
Trucking	3,253
Vineyard Development	15,793
Vineyard Materials	871
Warehousing	1,120
Wine Labs	52
Winery Tourism	28,877

Sources: Wine Institute, Economic Forensics and Analytics (EFA)

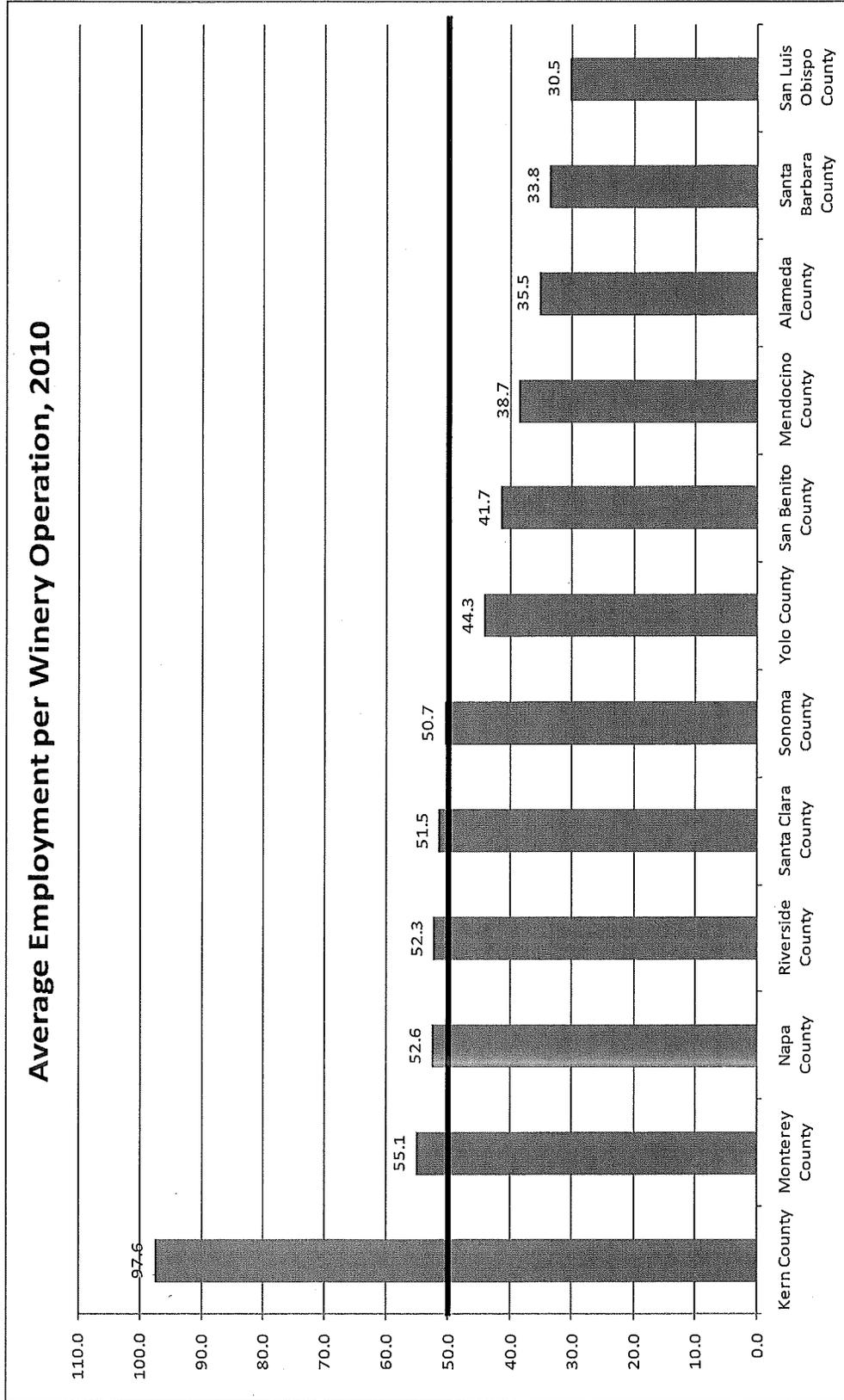
Figures 1 and 2 summarize the employment levels and proportions of total industry employment in California and its major wine-producing counties. The recent recession has caused some contractions in both vineyard and winery employment. We should think of vineyard farms and wineries in these counties as small businesses on average; this regulation would affect those businesses directly and their ability to remain viable, going concerns. A small business is generally seen as a business with fewer than 50 employees.

Figure 1



Sources: EFA and Census Bureau

Figure 2



Sources: EFA and Census Bureau

Frost Protection Methods and Vineyards in California

Frost protection is essential for vineyard management. While vineyards lie dormant during the winter months, they are protected from frost destroying the rootstock, buds and structure through water. There are other methods to protect against frost, such as wind and heat. Conversion to wind and heat methods require relatively large capital costs (heat also has high operation costs for fuel) to vineyard owners and farmers, specifically the capital purchase and the installation. We assume that frost protection with water is used because over time, farmers recognize that wind and heat are not as economically viable as water-based protection, especially in valley floors that are the coldest. This is especially true in Mendocino County, which is typically cooler than Sonoma County. This study will focus on wind due to its use in Sonoma and Mendocino counties already, and its known efficiency versus other methods beyond water.

A recent survey by Sonoma County Farm Bureau (2009) provides insight as to the amount of land in Sonoma County that is currently frost protected. We will assume that all vineyards in Mendocino County are frost protected. There are approximately 13,858 acres subject to conversion in Sonoma County (Barton, pers. comm., 2010) and 17,194 acres in Mendocino County (NASS, 2010). We will assume that the total amount of acreage that would need to be converted to non-water frost protection is at a minimum 31,052 (13,858 + 17,194). Of Sonoma County's vineyards, there were 3,807 acres using wind machines in 2008 (Sonoma County Farm Bureau, 2009).

Frost Protection Methods in the Russian River Watershed

These figures include bearing and non-bearing acres, as the assumption is that non-bearing acres that are planted likely have frost protection at some percentage close to the average of Sonoma County farms. Wind is the most common frost-protection method not using water. A good description of other methods beyond wind is McGourty and Smith (2009).

Other methods include:

- Heaters
- Pond Construction and Use
- Well Construction and Use
- Bonfires: leads to smoke that creates an inversion layer
- Forced cold air displacement
- Frost Fan (quasi-wind, but different)
- Helicopters
- Thermal Blankets
- Poly Hoop Covers
- Site Change
- Ice-Nucleating Bacteria
- Chemical Sprays

Many vineyard owners in Mendocino County have implemented Best Management Practices (BMPs), such as constructing ponds, to address the concerns about Russian River water diversions during the frost season. The idea behind building ponds was that rather than directly diverting from a stream and potentially reducing the water available for fish during the frost season, the vineyard owners would divert water from a reservoir that had been filled before the frost season. These actions have attempted to reduce the impact of frost protection on salmonid species and increase the water available to farmers in the form of reservoirs. A recent report, prepared as a response and description of BMPs to the State Water Resources

Control Board, discusses at length the current state and planned construction and resources for ponds in Mendocino County as well as other types of BMPs. URSA (2009) provides a survey of current construction locations and costs (Ibid. page 17, Table 1), as well as actions to be taken through 2014 (Ibid. pages 19-21). A “Frost Task Force” has been assembled as a consortium of the California Land Stewardship Institute, Mendocino County Farm Bureau, and others to oversee this process. In short, this task force has the following objectives (Ibid. page 19):

- Complete an annual fish-friendly farming program enrollment and frost water conservation improvements and complete implementation of BMPs;
- Establish Science Advisory Group;
- Seek funding for Integrated Monitoring and Watershed Analysis for tributaries;
- Prepare detailed scope for Ukiah recycled water use feasibility study and seek funding; and
- Establish quarterly meetings with the Resource Agencies.

For this study, it is important to focus on the differential cost between the current frost protection method and the alternative protection method. There seem to be many choices from the previous page, but because wind machines already exist in Sonoma County, it is likely that growers forced to convert from frost-protection water would choose wind.³ The typical wind machine installation has the following components and approximate costs, for a total of \$32,871⁴:

³ See Barton (2010) for a more detailed analysis of wind machine installation and operation.

⁴ Ibid., page 8

- Parts and accessories (\$28,171)
- Installation (\$2,700)
- Assembly (\$2,000)

The financing would be similar to that for a pond (assume a 10-year business loan at 7% percent interest), and each machine would cover approximately 12 acres per machine; estimated total costs for Sonoma and Mendocino counties for both installation and operation of new wind machines are listed in Table 5 and 6. A major assumption, which is unlikely to hold, is that Sonoma and Mendocino counties have topography that allows for wind to protect all acreage not currently protected by wind. This idea, including a coverage assumption of 12 acres per machine, makes these conservative calculations.

Table 5: Estimated Installation Costs for Wind Machines

Category	Sonoma	Mendocino
Farms	271	170
Cost per machine	\$32,000	\$32,000
Machines/acre	8.33%	8.33%
Acres to be Converted	13,858	17,194
Wind Machines Needed	1,155	1,432
Direct Cost	\$36,954,667	\$45,850,667
Debt Service (assume a 7% rate on capital)	\$2,587,597	\$3,210,502

Source: Barton (2010) and EFA

There is a lot of important data in Table 5, and one item that cannot be overlooked is the revenue for businesses that sell and install wind machines. The “Direct Cost” row in Table 5 represents this positive economic impact on the California economy as a result of this

regulation⁵. However, much depends on the lending environment and who ultimately pays (i.e. the wine grape growers) for these changes. Tables 5 and 6 assume a 7% loan for 10 years as these are capital improvements rather than land or property improvements.

Table 6: Operational Cost Differential, Wind Machines and Water-Based Protection

	Sonoma	Mendocino
Farms	271	170
Per Acre Cost of Wind	\$170	\$300
Per Acre Cost of Water-based	36	36
Acres To be Converted	13,858	17,194
Annual Op Costs Wind	2,355,860	5,158,200
Annual Op Costs Water	498,888	618,984
Differential	\$ 1,856,972	\$4,539,216

Source: Barton (2010) and EFA

Water Diversions and Stream Monitoring Costs

Complying with this regulation would require measuring the water use and stream flows; there are costs for monitoring water diversions as well as how well the streams are supporting the salmonid species. The SWRCB estimated that 1,598 diversion meters would need to be installed to complete this process (Barton, pers. comm., 2010). In addition, according to Barton, each diversion meter has a purchase and installation cost of \$8,857, and a \$1,619/yr cost of operations (Barton, 2010). Further, there would be stream monitoring equipment for 31 “stations”; each station is estimated to cost approximately \$15,000 to

⁵ Tables 15 – 20 show the economic impacts of these new expenditures on companies that sell and install wind machines and related industries.

purchase and install, and another \$13,000 annually to operate (Barton, pers. comm., 2010).

The annual cost of this monitoring would be approximately \$2,833,000 and \$1,904,000 for Sonoma and Mendocino farmers respectively.

Vineyard Net Revenue Loss Estimate

The capital cost of new equipment and its installation reduces farmers' net revenues, but is also a gain for those companies that install and sell the equipment. As shown above, the costs per acre to install new equipment may be relatively large or small, but the fact that the farmer is mandated to spend that money forces higher costs on vineyard owners. The larger the vineyard, the larger the absolute cost; the relative cost depends, of course, on the efficiencies of the method(s) chosen. We will assume that the typical farmer will choose the most cost-effective method of frost protection with respect to the potential net revenue generation from that method's operation.

In addition to the costs of installing monitoring devices, monitoring streams and water diversions, and converting to non-water frost protection methods, farmers will bear the cost of any crops lost due to displacement of funding that historically would have supported labor and other capital to produce crop yields. As farmers pay to purchase and install these machines and monitoring devices, it is assumed they will reduce their workforce to remain in business. There is a possibility they may not be able to stay in business. The assumptions here will not argue the idea that wind machines will be less efficient than water-based frost protection, though there are suggestions that wind is less efficient; the key here is that the new costs borne by the industry will force vineyard farms to reduce their labor force and yields such that there is a further loss of net revenue which could even leave some farms non-viable. The range discussed

below is if 10% to 30% of the historic crop yields are lost to the industry. These losses will begin a chain reaction throughout the industry, from wineries to other allied industries that magnify the effects of this regulation.

Lost crop yields lead to lost revenue for farmers; the lost net revenue to vineyard farms includes lower yields and the regulation’s costs. There also needs to be recognition that every dollar lost to a farmer in revenue will not become a lost job. A portion of lost revenue will likely lead to lost jobs, as different farmers will have different cost structures. In summary, the estimated net revenue lost includes the estimated, additional cost of new frost protection methods, stream monitoring as well as lost revenue due to crop yield reductions.

Table 7 summarizes the estimated net revenue losses for farmers based on different crop loss scenarios, using 2009 revenues and that 25% of that loss would cover labor and not other expenses. This is a conservative estimate at 10%; if there were 30% reduction in yields due to the regulation, the losses would be approximately three times the 10% losses, assuming the allied industries in these counties were able to remain stable in the face of these losses. Table 7 provides the estimated net revenue reductions based on different crop loss scenarios. The figures are the beginning of the economic impact analysis below.

Table 7: Lost Vineyard Farm Net Revenue based on Crop Loss Scenarios

Lost Revenues	Sonoma	Mendocino
10% Crop Loss, 5 year avg.	\$26,127,677	\$5,280,375
30% Crop Loss, 5 year avg.	\$78,383,031	\$15,841,125

Note: Includes all annual, estimated costs of regulation (wind, meters) above

Change in Land Values

Another effect of this regulation would be the reduction of wealth for vineyard farmers. If we assume that vineyard land will be restricted from using water-based frost protection, and net revenues are reduced because of that mandate, the value of land either currently bearing grapes, or planted and not yet bearing, will decrease. What makes land valuation difficult is that there are many factors involved in such a calculation, including different harvest values for different varieties, other potential uses of vineyard land, and the water rights associated with that land. This regulation may change the value of land depending upon these variables. As land values fall due to lower profitability levels from the land, the owners have lower returns on both income and wealth. This slows the general expansion of the industry, which can exacerbate lower volumes and sales. The reduction in the land's value may change the amount of wine grapes harvested because if both net revenues and land values are falling, certain landowners will simply stop producing grapes and move to growing something else or even leave the land without any crop.

A simple way of estimating the profitability of land is to estimate the revenue it generates for farmers and then subtract the costs of operations. Because the regulation will have the effect of both reducing revenue and increasing operational costs, the profitability of the land (measured by net revenue before interest, depreciation, amortization and taxes) will be affected on both sides to the farmer's detriment.

Estimated Productivity Loss of Vineyard Land due to Regulation

Tables 8 through 12 use an analysis based on agricultural economics literature concerning farmers' reactions to lost net revenues, in terms of "elasticity" (see Volpe, et. al.,

2010). The regulation would force new costs and lost sales onto farms; as net revenues fall in the short term, the effects are relatively small. Lost net revenue year after year, and an inability to reinvest as much in the business, makes land less valuable from both reduced productivity and in terms of lower return on investment. Note that there is no time frame associated with the short and long runs. The term “short run” refers to a time period in which the farmer’s costs are a mix of fixed and variable elements; the term “long run” represents the ability of farmers to convert all costs to variable and remain viable. The inception of the long run could be 3 years or 30 years, but we will assume that the long run begins within 5 years.

The long-run effects are more devastating because farmers are making adjustments to survive, which means cutting labor and reducing production levels. Suppose there are initially (short-run) 10% crop losses in each of Sonoma and Mendocino counties as a result of the mandated changes to frost protection. Volpe, et al. (2010) uses a methodology that implies short-run and long-run adjustments are different to losses as farmers adjust their plantings, acreage and labor expenses.

Table 8: Estimated Lost Net Revenues from Regulation as % of Total Revenue

		10% Crop Loss	30% Crop Loss
Lost Revenues	Sonoma	\$26,127,677	\$78,383,031
	Mendocino	\$5,280,375	\$15,841,125
Total Value of Vineyard Yields (From Table 3)	Sonoma	\$293,863,975	\$293,863,975
	Mendocino	\$53,233,883	\$53,233,883
% Total Value Lost	Sonoma	8.90%	26.70%
	Mendocino	9.90%	29.70%

Note: “Total Value” is the 2009 revenue to wine grape farmers for the specific county

Table 9 shows how the percentage of net revenues lost has both short-run and long-run effects. Notice that in the short-run, a regulatory change is more easily absorbed by farmers than an unfunded mandate that is perpetual in nature. The multiplier in Table 9 connects farmer reactions to lost revenue; in the short-run, losses are assumed to be mitigated by farmers using efficiencies where they can. In the long run, farmers run out of options after successive years of losses. Within five years, almost one-half of vineyard revenue may be eliminated if crop losses are 30% for five years in a row from 2009 levels in both counties. Table 10 simply shows the dollar figures associated with these percentages by combining a five-year average of Table 3's total value figures and the percentage reductions in Table 9.

Table 9: Response of Vineyard Revenues to a Change in Average Net Revenues

Loss %	% Reduction (Table 8)		Multiplier		Short Run % Reduction		Long Run % Reduction	
	Sonoma	Mendo	SR	LR	Sonoma	Mendo	Sonoma	Mendo
10%	8.9%	9.9%	0.2	1.66	1.8%	2.0%	14.8%	16.5%
30%	26.7%	29.7%	0.2	1.66	5.4%	6.0%	44.4%	49.5%

Table 10: Estimated Annual Loss of Vineyard Land Values

		From Table 9 (% Reduction)		Dollar Estimates of Annual Lost Value	
		10%	30%	10% Loss	30% Loss
Sonoma	SR	1.8%	5.4%	\$5,308,008	\$15,924,024
Mendo	SR	2.0%	6.0%	\$1,072,743	\$3,218,229
Sonoma	LR	14.8%	44.4%	\$43,399,861	\$130,199,583
Mendo	LR	16.5%	49.5%	\$8,771,064	\$26,313,192

The real estate market's pricing of vineyard land is difficult to determine fully, but revenue losses each year will slowly decay vineyard property values in each county. The present value of the sum of those annual losses provides an estimation of the real estate

market's valuation change for vineyard lands. Based on Table 10's dollar losses, Tables 11 and 12 are based on short-run and long-run effects on farmer revenues; these figures represent the present value of annual losses as described in Table 10 over a five-year period. If seen as perpetual reductions in value, the overall lost land values are significantly larger.

Table 11: Estimated Loss of Land Values, 10% Crop Loss Scenario

Crop Loss %	Loss of Land Value	Land Value Loss	Lost Property Taxes
10%	Sonoma	\$94,583,000	\$1,040,000
10%	Mendocino	\$19,115,000	\$210,000
Total		<u>\$113,698,000</u>	<u>\$1,251,000</u>

Table 12: Estimated Loss of Land Values, 30% Crop Loss Scenario

Crop Loss %	Loss of Land Value	Land Value Loss	Lost Property Taxes
30%	Sonoma	\$283,748,000	\$3,121,000
30%	Mendocino	\$57,345,000	\$631,000
Total		<u>\$341,094,000</u>	<u>\$3,752,000</u>

The values in Tables 11 and 12 assume that property taxes are 1.1% of the assessed value of land; property taxes affect local governments, specifically education and public safety, more than state governments. Another level of impact comes from lost tax revenues specific to the wine industry, which is already a heavily regulated industry.

The Tax Impact on California's Governments

This regulation, which acts like a tax, affects an industry that already has multiple layers of compliance and taxation. Taxes in the wine industry are collected at the production, distribution/importation, and retail levels. This includes California Redemption Value (CRV) taxes on the containers, sales taxes, federal and state excise taxes, and production taxes. There are also lost tax revenues for local and state governments due to the multiplier effects of lost

jobs, lost revenues on all business and household taxes, including lost property taxes, DMV fees, employment taxes, and income taxes. Below is a brief description of how the supply chain in the wine industry provides tax revenue for the state of California, and how the effects described above would reduce the overall tax revenue.

The Three-Tier Distribution System for Wine in California

The three-tier system of distribution that is mandated by the California government (as in many states) for moving alcohol from production or importation to retail is a holdover from the 21st Amendment to the U.S. Constitution that repealed the 18th Amendment concerning prohibition. California attempts to track any and all alcoholic beverages that are produced, distributed/imported and sold throughout the state and also those exported from California. The main economic reason for this is to collect taxes at each point on that chain. (There are taxes collected by the federal government as well.) In many ways, this three-tier system is in place to tax wine (and alcohol more generally) as an issue of assumed temperance and as a way to tax an assumed, inelastically demanded product.

There is also a connection between each of these tiers that is economic beyond the taxation. In many cases, wineries are vertically integrated along this chain which links decisions in the vineyards directly to decisions in the winery and by sales staff. For those wineries that are located where a tasting facility makes both economic and regional sense, there are also retail sales directly linked to the decisions in the vineyards. A regulatory change, such as the frost protection initiative, has effects far beyond the vineyard because of these connections.

The overall tax impacts of this regulation are estimated below, but there will be three levels of tax losses for government, and no real fiscal relief in terms of expense reduction (especially if stream monitoring becomes a government job and is not done by private concerns):

- Lost taxes specific to the production, sale and consumption of wine grapes and bottled wine (state and federal).
- Lost sales taxes (state).
- Lost property and TOT taxes due to lower land values and reduced tourism.

TOT stands for “Transient Occupancy Tax” or the tax levied on hotel stays, which acts like a sales tax specific to renting accommodations. The next section provides a background on tourism’s links to the wine industry, where Sonoma and Mendocino counties are significant portions of California’s tourism and hospitality industry around wine.

Tourism and the Wine Industry

Tourism industries are tied to the wine industry in California, especially in the Russian River Valley and Basin. Much of Sonoma County’s and Napa County’s economy is either directly or indirectly affiliated with the wine industry. Restaurants, hotels, limousine services, linen cleaners and suppliers, food service organizations, construction, landscaping, information technology--all have some connections, including branding. Sonoma County’s tourism bureau now refers to the county as “Sonoma Country” where traveling to Sonoma County is seen as analogous to a passage to rural France or Italy among the vines.

The frost protection regulation would have multiplicative, focal effects on local tourism in these areas. Dean Runyan Associates publishes tourism statistics for all of California and each county for the state government. Further, the Wine Institute's study on the economic impact of wine on the California economy (2000-2009) provides a more detailed analysis specific to the wine industry. Table 13 uses data from both sources, as well as updating to provide a direct impact for the IMPLAN analysis below.

Table 13: Wine Industry Tourism Data, 2009 \$ and Jobs

County	# of Wineries	Winery Tourists (thousands)	Winery Tourism Expenditures (\$000)	Wine Tourism Payroll (\$000)	Wine Tourism Employment (Jobs)	Local Taxes (\$000)	State Taxes (\$000)
Napa	711	8,455.26	\$823,840	\$90,312	9,550	\$26,880	\$28,960
Sonoma	585	3,582.48	361,577	34,833	4,719	7,781	14,108
San Luis Obispo	342	948.53	136,584	16,981	2,090	3,048	5,268
Santa Barbara	180	1,035.41	117,568	14,170	1,458	3,440	4,568
Mendocino	109	398.82	84,075	16,433	1,500	1,950	3,075
All Other Counties	1,032	2,571.77	316,947	44,806	9,453	7,098	12,817
California Totals	2,959	16,992.27	\$1,840,591	\$217,535	28,770	\$50,197	\$68,796
Sonoma and Mendo	694	3,981.30	\$445,652	\$51,266	6,219	\$9,731	17,183

Source: Wine Institute, Dean Runyan Associates, and EFA

As can be seen by Table 13, Sonoma and Mendocino counties bring over \$9 million in local taxes per year into their communities from winery tourism, almost 20% of the state total for local taxes derived from the wine industry's tourism activities in California. Generally, Sonoma and Mendocino counties provide between 20% and 25% of the total economic flows for winery-related tourism in this state. Within the state and local tax revenues are TOT taxes based on hotel stays and other overnight accommodations.

Vineyard Farms are Small Business

Small business can be defined in many ways. For this study, a small business is one with up to 50 employees; recent tax credits for small business use 50 employees as the maximum number to qualify⁶. As small businesses fail, so do many households. The key idea here is that the effects on the wine industry as a result of this regulation will fall squarely on small business; like any other tax, the incidence of this regulation will act regressively in terms of size. In this report, we will also use the number of acres of vineyard as a measure of small business, and for wineries the case volume acts as a measure of small business as well.

Vineyard Farms and Wineries as Small Businesses

While it is true that large wineries may also hold significant acreage, many large wineries may still purchase grapes from farmers with contracts and thus utilize smaller businesses for raw materials. In a similar way to any manufacturing process, wineries rely on both small and large firms to supply them with their raw materials. However, many wineries are also small businesses, where small businesses are defined as firms with 50 or fewer full-time employees. Figures 1 and 2 provide a comparison of average employment across vineyard farms in major wine-growing counties of California. Wineries are also chiefly small businesses in California. The wine industry, as with other agricultural products, was run by family-owned firms for most of the 20th century. Consolidation and financial crises have changed the landscape of wineries in the past twenty years. The size of wineries is mainly a function now of location; smaller wineries exist throughout northern California. Recent research (Cordano, et

⁶ See the Small Business Health Care Tax Credit for Small Employers.
<http://www.irs.gov/newsroom/article/0,,id=223666,00.html>

al., 2010) suggests that 16% of wineries are family-owned, and 90% have fewer than 35 employees.

Economic Impact Analysis

Like a rock dropped into a pond, the regulation will produce effects on California in lost business revenues, lost jobs and reduced tax revenues. The IMPLAN[®], which stands for IMpact analysis for PLANning, is a model by which municipalities and counties worldwide analyze the employment, business revenue and tax effects of economic events. In many cases, these models are used to explain and estimate the positive effects of new incomes or jobs. In this study, IMPLAN estimates the effects of net economic losses due to higher costs of frost protection as a cost of goods sold. There are three classifications of these effects. The **direct** effects are those that initiate the impacts. For example, the increase in frost protection costs, which may range from the purchase of new frost protection methods to a reduction of vineyards overall, increases the costs of producing wine grapes. This direct effect begins a chain reaction of higher prices and lost jobs, which generates direct effects on local employment, tax and business revenues.

Indirect effects come from directly-affected workers and businesses reducing their spending on other businesses' goods and services. This loss of revenue flow to other businesses leads to additional employment, revenue and tax losses indirectly caused by the initial event. For example, when a vineyard owner has an increase in costs (loss of income), the owner purchases fewer restaurant meals, office supplies, and other basics. The restaurants and office supply retailers lose income; as merchants' sales fall, they contract their employment

base to reflect their reduced demand. These additional job and revenue losses create **induced** effects. The induced effects are similar to the indirect effects, but come from the indirectly-affected workers and firms and their spending on the local economy more broadly. For example, the office supply worker who loses her job due to a reduced demand for the office supply's goods and services reduces her demand of a broad range of personal services, retail products and other spending. Figure 3 provides a way to picture the economic impact process.

The sum of these direct, indirect, and induced effects is the total or overall economic impact of the original event. Because this regulation would have sequential effects--first the net effects of conversion to non-water frost protection, then the changes to operations based on these additional costs—the chain of events in calculating the overall economic impacts are described below.

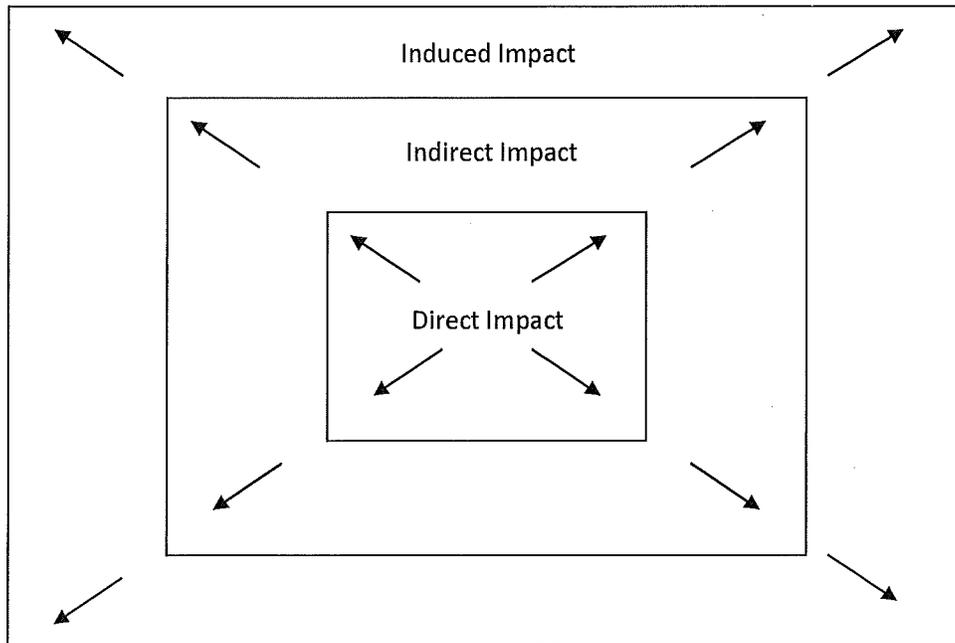
Tables 21 to 26 provide the estimated economic impacts of this regulation on operations in vineyards and wineries in Sonoma and Mendocino counties, and then the effect on allied industries throughout California. It is important to realize that the net gains and losses from this regulation are statewide because of the breadth of effect that wine and winegrapes have on many industries throughout the state. Estimated job impacts are in terms of full-time equivalent employees.

Install/Conversion Costs, Benefits:

This regulation's economic effects would begin with the required conversion, for vineyards currently using water to protect against frost, to frost protection methods that do not divert water from the Russian River. The installation of this new capital, and the potential

removal of current capital, has confounding effects because there are heightened business costs for vineyard owners, but also new business revenues generated by the sale and installation of this capital. Firms that specialize in wind machines, frost fans, and other frost protection methods will gain from this regulation in sales they receive from artificial marketing. Of course, those that own vineyard will either convert vineyards (and bear that cost) or potentially stop growing grapes.

Figure 3: Economic Impact Concept



Some assumptions are needed to make an estimate of these costs. The following list provides the assumptions for the estimated economic impact concerning lost revenues and labor from the regulation:

- There are one-time costs of installation and purchase of the wind machines, and the diversion and stream monitoring equipment.

- There are also one-time benefits to firms that both sell and install these wind machines and diversion and stream monitoring equipment.
- There are revenue losses to vineyard farms as a result of lower frost-protection efficiency, higher costs or both (assuming a 10% crop loss).
- There are specific losses in tourism, state and local taxes, and other allied industries based on 10% crop losses.
- There are losses to the value of vineyard land based on reduced profitability because of the regulation.

The links between vineyard workers and workers throughout the allied industries begin with the relationship between vineyard workers and winery workers. Recent Census Bureau data shows that there were 13,596 winery workers on average in Sonoma and Mendocino counties in 2009. There were 3,634 vineyard workers. We will assume a 3 to 1 ratio (instead of a 3.74:1 ratio which the data imply) as a conservative estimate of how vineyard jobs lost will trigger winery jobs lost if the genesis of vineyard jobs lost is lower tonnage (based upon the assumed 10% crop loss) in these counties.

Table 14: Vineyard and Winery Lost Workers, 10% and 30% Crop Loss Scenarios

	% Crop Loss	Year 1	Year 2	Year 3	Year 4	Year 5	Average Vineyard	Average Winery
Sonoma	10%	47.8	133.5	219.2	304.9	390.6	219.2	657.6
Mendocino	10%	9.7	27	44.3	61.6	78.9	44.3	132.9
Sonoma	30%	238.9	667.4	1,095.9	1,524.5	1,953.0	1,095.9	3,287.8
Mendocino	30%	48.3	134.9	221.5	308.1	394.7	221.5	664.5

There are also immediate positive economic impacts of these new sales to these companies in California; we assume that all sales will be to local and regional firms that specialize in sales and installation of these machines.

Table 15: Economic Impacts on Frost Protection Companies, New Business Revenue, 2010\$

Industry	Direct	Indirect	Induced	Total
Wind Machine Firms	\$82,805,248			\$82,805,248
Architectural services		6,135,536	113,727	6,249,263
Petroleum refineries		4,945,840	942,782	5,888,622
Rental Income for Property Owners			4,980,224	4,980,224
Wholesale trade businesses		2,517,856	2,089,808	4,607,664
Real estate establishments		766,160	1,821,924	2,588,084
Food services and drinking places		333,300	1,672,468	2,005,768
Medical Offices		4	1,802,960	1,802,964
Private hospitals		5	1,492,844	1,492,849
Legal services		877,354	571,946	1,449,300
All Others		17,449,289	23,456,791	40,905,983
Total	\$82,805,248	\$33,025,344	\$38,945,377	\$154,775,969

Table 16: Economic Impacts on Frost Protection Companies, New Jobs

Industry	Direct	Indirect	Induced	Total
Construction	484.2			484.2
Landscape and vineyard design firms		43.7	0.8	44.5
Restaurants and bars		5.4	26.9	32.3
Wholesale trade businesses		12.1	10	22.1
Medical and Dental Offices			14.2	14.2
Employment services		9.8	4.3	14.1
Real estate establishments		4.1	9.9	14
Retail Stores		2.3	8.1	10.4
Private hospitals			10.3	10.3
Grocery Stores		2.2	8	10.2
All Others		89.3	160	249.3
Totals	484.2	168.9	252.5	905.6

Table 17: Economic Impacts on Monitoring Equipment Companies, New Business Revenue, 2010\$

Industry	Direct	Indirect	Induced	Total
Services to buildings and dwellings	\$10,267,925	\$42,562	\$23,685	\$10,334,172
Gasoline Refining		1,773,508	116,259	1,889,767
Rental Income for Property Owners			604,680	604,680
Real estate establishments		161,618	226,406	388,024
Wholesale trade businesses		87,003	259,036	346,039
Restaurants and Bars		47,701	205,208	252,909
Insurance carriers		91,266	147,377	238,643
Telecommunications		167,457	70,178	237,635
Medical and Dental Offices			221,986	221,986
Utilities		185,281	14,961	200,242
All Others		1,576,960	2,884,552	4,461,513
Total	\$10,267,925	\$4,133,357	\$4,774,328	\$19,175,610

Operational Impacts

The major losses from this regulation come as a result of the cost to farmers of conversion, their reduced budgets and yields and then the proliferate effects of these changes on the wine industry as a whole. These effects are on firms of all types, some more than others. Three key elements of these economic impacts stand out:

1. Sonoma and Mendocino counties have highly integrated tourism and hospitality markets alongside of their vineyard operations, which is different than vineyards in California's central valley on average.
2. We assume that a change in the amount of employment and yield of grapes is a function of budget shocks due to the conversion and operation of new frost protection machine installation.

3. Other industries are allied with vineyard operations such that changes to vineyards that are detrimental have a domino effect on these industries as if they are directly involved.

Table 18: Economic Impacts on Monitoring Equipment Companies, New Jobs

Industry	Direct	Indirect	Induced	Total
Services to buildings and dwellings	158.6	0.7	0.4	159.6
Food services and drinking places		0.8	3.3	4.1
Employment services		2.3	0.5	2.8
Real estate establishments		0.9	1.2	2.1
Medical and Dental Offices			1.7	1.7
Wholesale trade businesses		0.4	1.2	1.7
Private hospitals			1.3	1.3
Retail Stores - General merchandise			1.0	1.0
Retail Stores - Food and beverage			1.0	1.0
Private household operations			1.0	1.0
All Others		9.4	18.3	27.7
Total	158.6	14.5	30.9	204.0

**Table 19: Economic Impacts on Monitoring Equipment Companies,
New State/Local and Federal Tax Revenues, 2010\$**

State and Local Taxes	Amount	Federal Taxes	Amount
Employment Taxes	\$30,392	Employment Taxes	\$735,404
Sales taxes	255,024	Corporate Income	107,489
Property Tax: Commercial	203,171	Personal Income	624,352
Property Tax: Residential	2,776	Other Taxes and Fees	84,491
Corporate Income	38,577		
Personal Income	228,897		
Other Taxes and Fees	215,298		
Total State and Local taxes	\$974,135	Total Federal	\$1,551,736

**Table 20: Economic Impacts on Wind Machine Equipment Companies,
New State/Local and Federal Tax Revenues, 2010\$**

State and Local Taxes	Amount	Federal Taxes	Amount
Employment Taxes	\$214,962	Employment Taxes	\$5,454,550
Sales taxes	1,570,679	Corporate Income	595,762
Property Tax: Commercial	1,251,320	Personal Income	4,933,285
Property Tax: Residential	21,935	Other Taxes and Fees	520,372
Corporate Income	213,813		
Personal Income	1,808,619		
Other Taxes and Fees	1,380,307		
Total State and Local taxes	<u>\$6,461,635</u>	Total Federal	<u>\$11,503,969</u>

As discussed above, the Wine Institute has done studies since 2000 about the economic impact of the wine industry on the California economy. These studies have consistently estimated the number of employees throughout California whose jobs are directly tied to the wine industry. The theory is that if it were not for the wine industry's existence in California, these jobs in wine-allied industries would not exist in California. If losses in vineyards due to this regulation make for losses in wineries as well, the combination of these losses will begin a ripple effect through many industries, but will originate in these allied industries. The following are the estimated losses of employees in wineries and vineyards, as well as in allied industries.

Table 21: Business Income Losses of Vineyards due to 10% & 30% Crop Loss, 2010\$

Industry	Direct	Indirect	Induced	Total at 10% Crop Loss	Total at 30% Crop Loss
Fruit farming	\$58,959,666	\$255,109	\$20,162	\$59,234,937	\$177,704,811
Ag Support activities		6,665,729	9,046	6,674,775	20,024,325
Rental income			3,159,045	3,159,045	9,477,135
Petroleum refineries		2,488,835	603,547	3,092,382	9,277,146
Wholesale trade businesses		1,563,591	1,341,955	2,905,546	8,716,638
Real estate establishments		1,026,317	1,171,707	2,198,024	6,594,072
Banks		1,285,530	513,687	1,799,217	5,397,651
Bars and Restaurants		94,350	1,067,489	1,161,839	3,485,517
Medical Offices		1	1,153,146	1,153,147	3,459,441
State/Local Government		742,283	319,999	1,062,282	3,186,846
All Other Industries		8,084,574	15,484,752	23,569,454	70,708,361
Total	\$58,959,666	\$22,206,319	\$24,844,535	\$106,010,648	\$318,031,943

Table 22: Lost Jobs in Vineyards from 10% & 30% Crop Loss

Industry	Direct	Indirect	Induced	Total at 10% Crop Loss	Total at 30% Crop Loss
Fruit farming	508.9	2.2	0.2	511.3	1,534
Support activities for agriculture and forestry		218.6	0.3	218.9	657
Food services and drinking places		1.5	17.2	18.7	56
Wholesale trade businesses		7.5	6.4	13.9	42
Real estate establishments		5.6	6.3	11.9	36
Medical Offices		0.0	9.1	9.1	27
Private hospitals		0.0	6.6	6.6	20
Banks		4.1	1.6	5.8	17
Retail Stores - General merchandise		0.1	5.1	5.2	16
All Other Industries		38.8	108.1	146.8	441
Total	508.9	278.4	160.9	948.2	2,845

Table 23: Lost State/Local and Federal Tax Revenues, 10% and 30% Crop Loss, Vineyards

State and Local Taxes	10% Loss	30% Loss	Federal Taxes	10% Loss	30% Loss
Employment Taxes	\$78,518	\$454,992	Employment Taxes	\$1,936,860	\$11,223,651
Sales taxes	772,531	4,476,635	Corporate Income	349,641	2,026,090
Property Tax: Commercial	615,232	3,565,124	Personal Income	1,686,552	9,773,172
Property Tax: Residential	7,378	42,751	Other Taxes and Fees	255,842	1,482,542
Corporate Income	125,418	726,766			
Personal Income	618,394	3,583,446			
Other Taxes and Fees	650,275	3,768,191			
Total State and Local taxes	\$2,867,746	\$16,617,905	Total Federal	\$4,228,895	\$24,505,455

Tables 24 through 26 provide similar information as Tables 21-23 but for wineries instead of vineyards. It is important to recognize that wineries use grapes from vineyards as a direct input, but are distinct business operations from the farming, even if the winery owns vineyards.

Table 24: Lost Jobs in Wineries from 10% and 30% Crop Loss

Industry	Direct	Indirect	Induced	Total at 10 % Crop Loss	Total at 30% Crop Loss
Wineries	1,904	94		1,998	5,994
Wholesale trade businesses		701	87	788	2,364
Fruit farming		493	2	495	1,485
Food services and drinking places		56	231	287	861
Management Consulting		246	14	260	780
Support activities for agriculture and forestry		211	4	215	645
Real estate establishments		95	86	181	543
Transport by truck		160	20	180	540
Medical Offices			123	123	369
Employment services		75	37	112	336
All Other Industries		1,194	1,558	2,752	8,257
Total	1,904	3,325	2,162	7,391	22,174

Table 25: Business Income Losses of Wineries due to 10% and 30% Crop Loss

Industry	Direct	Indirect	Induced	Total at 10% Crop Loss	Total at 30% Crop Loss
Wineries	\$1,085,789,940	\$53,517,950	\$246,465	\$1,139,554,355	\$3,418,663,065
Wholesale trade businesses		146,108,775	18,240,212	164,348,987	493,046,961
Management Consulting		58,329,168	3,297,745	61,626,913	184,880,739
Fruit farming		57,099,706	273,904	57,373,610	172,120,830
Imputed rental activity			42,161,345	42,161,345	126,484,035
Real estate establishments		17,484,874	15,962,060	33,446,934	100,340,802
Glass container manufacturing		31,124,809	50,212	31,175,021	93,525,063
High-tech manufacturing		24,969,466	484,384	25,453,850	76,361,550
Transport by truck		22,001,728	2,738,248	24,739,976	74,219,928
Petroleum refineries		13,703,246	8,166,800	21,870,046	65,610,138
All Other Industries		253,733,939	242,807,502	496,543,344	1,489,630,033
Total	\$1,085,789,940	\$678,073,661	\$334,428,877	\$2,098,294,381	\$6,294,883,144

Table 26: Lost State/Local & Federal Tax Revenues, 2010\$, 10% and 30% Crop Loss, Wineries

State and Local Taxes	10% Loss	30% Loss	Federal Taxes	10% Loss	30% Loss
Employment Taxes	\$2,229,716	\$6,689,149	Employment Taxes	\$52,852,463	\$158,557,389
Sales taxes	51,843,283	155,529,849	Corporate Income	8,570,412	25,711,237
Property Tax: Commercial	41,302,114	123,906,342	Personal Income	43,585,145	130,755,436
Property Tax: Residential	194,220	582,659	Other Taxes and Fees	17,175,099	51,525,296
Corporate Income	3,077,047	9,231,140			
Personal Income	15,979,316	47,937,947			
Other Taxes and Fees	26,421,471	79,264,414			
Total State and Local taxes	\$141,047,166	\$423,141,499	Total Federal	\$122,183,119	\$366,549,358

The Wine Institute studies have consistently estimated the number of employees throughout California working in industries that are directly tied to the wine industry. Table 4 provides the latest estimates. The theory is that if it were not for the wine industry's existence in California, these jobs would not exist in California.

Table 27: Estimated Lost Jobs to Allied Industries, 10% and 30% Crop Loss Scenarios

Allied Industries	10% Totals	30% Totals
Boxes/Inserts and Bags	12.4	37.3
Cooperage	3.7	11
Corks/Caps/Screwtops	0.9	2.8
Distributor	51.9	155.6
Education and Research	0.5	1.4
Glass Bottles	12.9	38.6
Labels	8.4	25.1
Grapevine Nurseries	20.7	62.1
Retail/Liquor/Grocery	16.9	50.6
Restaurants	159.6	478.8
Stainless Steel	2.3	6.9
Trucking	7.9	23.7
Vineyard Development	221.9	665.7
Warehousing	4.5	13.4
Totals	524.4	1,573.1

Table 28: Estimated Business Revenues Lost, Allied Industries, 10% and 30% Crop Loss

Allied Industry	10% Loss	30% Loss
Boxes/Inserts and Bags	\$3,297,014	\$9,891,043
Cooperage	589,978	\$1,769,934
Corks/Caps/Screwtops	169,236	\$507,707
Distributor	9,621,185	\$28,863,555
Education and Research	78,801	\$236,402
Glass Bottles	3,691,881	\$11,075,642
Labels	1,146,414	\$3,439,242
Grapevine Nurseries	3,031,578	\$9,094,733
Retail/Liquor/Grocery	1,851,538	\$5,554,613
Restaurants	14,069,664	\$42,208,993
Stainless Steel	852,400	\$2,557,200
Trucking	1,198,233	\$3,594,698
Vineyard Development	11,339,907	\$34,019,721
Warehousing	\$487,850	\$1,463,551
Totals	\$51,425,678	\$154,277,034

Table 29: Estimated Federal and State/Local Tax Revenues Lost, 10% and 30% Crop Loss

Allied Industry	Federal Taxes		State/Local Taxes	
	10% Loss	30% Loss	10% Loss	30% Loss
Boxes/Inserts and Bags	\$193,013	\$579,039	\$134,841	\$404,522
Cooperage	39,221	117,662	24,256	72,769
Corks/Caps/Screwtops	12,836	38,508	6,991	20,974
Distributor	874,380	2,623,140	1,067,741	3,203,222
Education and Research	7,785	23,354	3,833	11,499
Glass Bottles	225,790	677,369	159,598	478,795
Labels	110,384	331,153	60,655	181,964
Grapevine Nurseries	254,851	764,554	143,280	429,839
Retail/Liquor/Grocery	175,792	527,375	218,739	656,217
Restaurants	1,144,438	3,433,313	1,009,393	3,028,180
Stainless Steel	40,144	120,433	29,085	87,254
Trucking	89,868	269,604	54,465	163,394
Vineyard Development	1,461,883	4,385,648	638,710	1,916,131
Warehousing	52,170	156,510	26,851	80,552
Totals	\$4,682,555	\$14,047,665	\$3,578,438	\$10,735,314

From these lost job numbers, we can estimate the economic impacts to California as a result of this regulation, where the job losses are likely sooner than later, but the lost business revenues and tax receipts for all levels of government are ongoing. Tourism is shown on its own, as it is tied very directly to the fates of both vineyards and wineries in these counties. From Table 4 above, the number of employees in winery tourism is tied to those in vineyards almost one to one; to remain conservative we will assume a one-to-two, tourism-to-vineyard worker ratio and show the resulting losses in revenue, jobs, and taxes. Assuming there is a loss of 509 vineyard jobs following a 10% reduction in crop yields due to the regulation, there would be 254.5 lost tourism jobs directly related to wine in Sonoma and Mendocino counties. The IMPLAN[®] model is used here specific to tourism because of tourism's many links to the economy.

Table 30: Lost Jobs from Reduction in Tourism, 10% and 30% Crop Loss Scenario

Industry	Direct	Indirect	Induced	Total at 10% Crop Loss	Total at 30% Crop Loss
Food services and drinking places	127.0	4.3	6.3	137.7	413.1
Other amusement and recreation industries	127.0	0.0	0.3	127.4	382.2
Real estate establishments	0.0	8.1	2.4	10.5	31.5
Employment services	0.0	6.6	1.0	7.6	22.8
Wholesale trade businesses	0.0	3.8	2.4	6.2	18.6
Services to buildings and dwellings	0.0	3.7	0.7	4.3	12.9
Offices of physicians, dentists, and other health practitioners	0.0	0.0	3.3	3.3	9.9
Accounting, tax preparation, bookkeeping, and payroll services	0.0	2.6	0.4	3.0	9
Performing arts companies	0.0	2.6	0.2	2.8	8.4
Management of companies and enterprises	0.0	2.4	0.4	2.8	8.4
All Others	0	37.7	41.5	79.1	237.3
Total	254.0	71.8	58.9	384.7	1,154.1

Table 31: Lost Business Incomes from Reduction in Tourism, 2010\$, 10% and 30% Crop Loss

Industry	Direct	Indirect	Induced	Total at 10% Crop Loss	Total at 30% Crop Loss
Other amusement and recreation industries	\$15,446,966	\$4,992	\$37,717	\$15,489,675	\$46,469,025
Food services and drinking places	7,897,789	270,445	391,917	8,560,151	25,680,453
Real estate establishments		1,497,898	435,984	1,933,882	5,801,646
Wholesale trade businesses		793,794	498,004	1,291,798	3,875,394
Imputed rental activity for owner-occupied dwellings			1,146,847	1,146,847	3,440,541
Insurance carriers		523,048	280,076	803,124	2,409,372
Petroleum refineries		464,386	222,767	687,153	2,061,459
Management of companies and enterprises		564,793	89,930	654,723	1,964,169
Electric power generation, transmission, and distribution		417,534	101,154	518,688	1,556,064
Offices of physicians, dentists, and other health practitioners		3	424,920	424,923	1,274,769
All others		7,998,385	5,483,381	13,481,766	40,445,298
Total	\$23,344,755	\$12,535,278	\$9,112,697	\$44,992,730	\$134,978,190

Table 32: Lost Federal and State/Local Tax Revenue from Lost Tourism Jobs/Revenue

(10% and 30% Crop Loss)

State and Local Taxes	10% Loss	30% Loss	Federal Taxes	10% Loss	30% Loss
Employment Taxes	\$61,781	\$185,343	Employment Taxes	\$1,454,515	\$4,363,545
Sales taxes	934,893	2,804,679	Corporate Income	347,784	1,043,352
Property Tax: Commercial	744,805	2,234,415	Personal Income	1,186,559	3,559,677
Property Tax: Residential	5,276	15,828	Other Taxes and Fees	309,734	929,202
Corporate Income	124,816	374,448			
Personal Income	435,011	1,305,033			
Other Taxes and Fees	652,790	1,958,370			
Total State and Local taxes	\$2,959,372	\$8,878,116	Total Federal Taxes	\$3,298,592	\$9,895,776

Conclusions and Policy Recommendations

This study provides an estimate as to the economic effects of a State Water Resources Control Board regulation concerning the use of Russian River water for frost protection in vineyards. This use of water is claimed to be detrimental to the natural habitat of specific, protected salmonid species. The economic impact of this regulation would begin with the costs of converting current, water-based frost protection to another method (most likely wind machines), but the regulation may also require farmers to pay for river diversion (water use) and stream habitat monitoring equipment where needed. The temporary stimulus from this regulation is that it would provide temporary demand for firms that sell, install or do both for wind machines and the monitoring equipment. This acts as a mitigating factor concerning the effects on California's economy.

The larger effects of this regulation are due to the multiplier effect not being constrained to vineyards. Because wineries rely on vineyards delivering a certain amount of yield in their planning and bottling strategy, a loss of harvested grapes due to new vineyard costs that act like a tax on farmers reduces the ability of wineries to produce wine. This forces

their revenues to go down. Because both vineyards and wineries are tied to many other industries in California, tourism being one of the largest but also rootstock nurseries, vineyard management and distribution, the effects of this regulation will start a domino effect with consequences well beyond the immediate effects on vineyards.

Even if we assume a modest 10% reduction in harvest grapes to Sonoma and Mendocino counties, the two counties most affected by this regulation due to geography, the effect on the California economy would be significant. Sonoma and Mendocino counties add up to about 25% of the wine industry depending on what part of the industry is of focus. The state of California will lose much more in tax revenue than it will gain through the small number of industries that would benefit from implementation of non-water-based frost protection. Further, farmers that are landowners will also experience a reduction in their land values since this regulation will directly affect the land's productivity through higher costs. In summary, the California economy is estimated, over the next five years, to experience the following economic effects from this regulation:

- Loss of business income
- Loss of jobs
- Loss of state and local taxes
- Loss of land values

The regulation could cost California over \$2 billion annually, as well as almost \$142 million in tax revenue (see below) to local governments and Sacramento at 10% crop losses. The mitigation of the benefit to wind and monitoring equipment companies is estimated as if all farmers will convert, pay the full price, and remain in business; if the crop or business losses are

more significant, the mitigation is smaller and the costs rise further. Land values that are already in freefall from the real estate bubble bursting will fall further specific to vineyard land.

Tables 33 and 34 provide summaries, assuming 10% and 30% crop losses.

Table 33: Sonoma and Mendocino Economic Impact from Regulation, 10% Crop Loss

Category	Lost Jobs	Lost Business Income (Annual)	Lost State and Local Taxes (Annual)
Due to Vineyard Losses	948	\$106,010,648	\$2,867,744
Due to Winery Losses	7,391	2,098,294,381	141,047,166
Due to Tourism Losses	384	44,992,730	2,959,372
Due to Allied Industries Losses	524	51,425,678	3,578,438
Mitigation* (Wind/Monitoring Equipment)	+1,110	+173,951,579	+7,435,770
Totals (lost jobs and annual \$)	8,137	\$2,126,771,858	\$143,016,950
		Lost Value	Lost Property Taxes
Lost Land Value		\$113,697,867	\$1,250,677

***Assumes no farmers go out of business before they convert frost protection to wind**

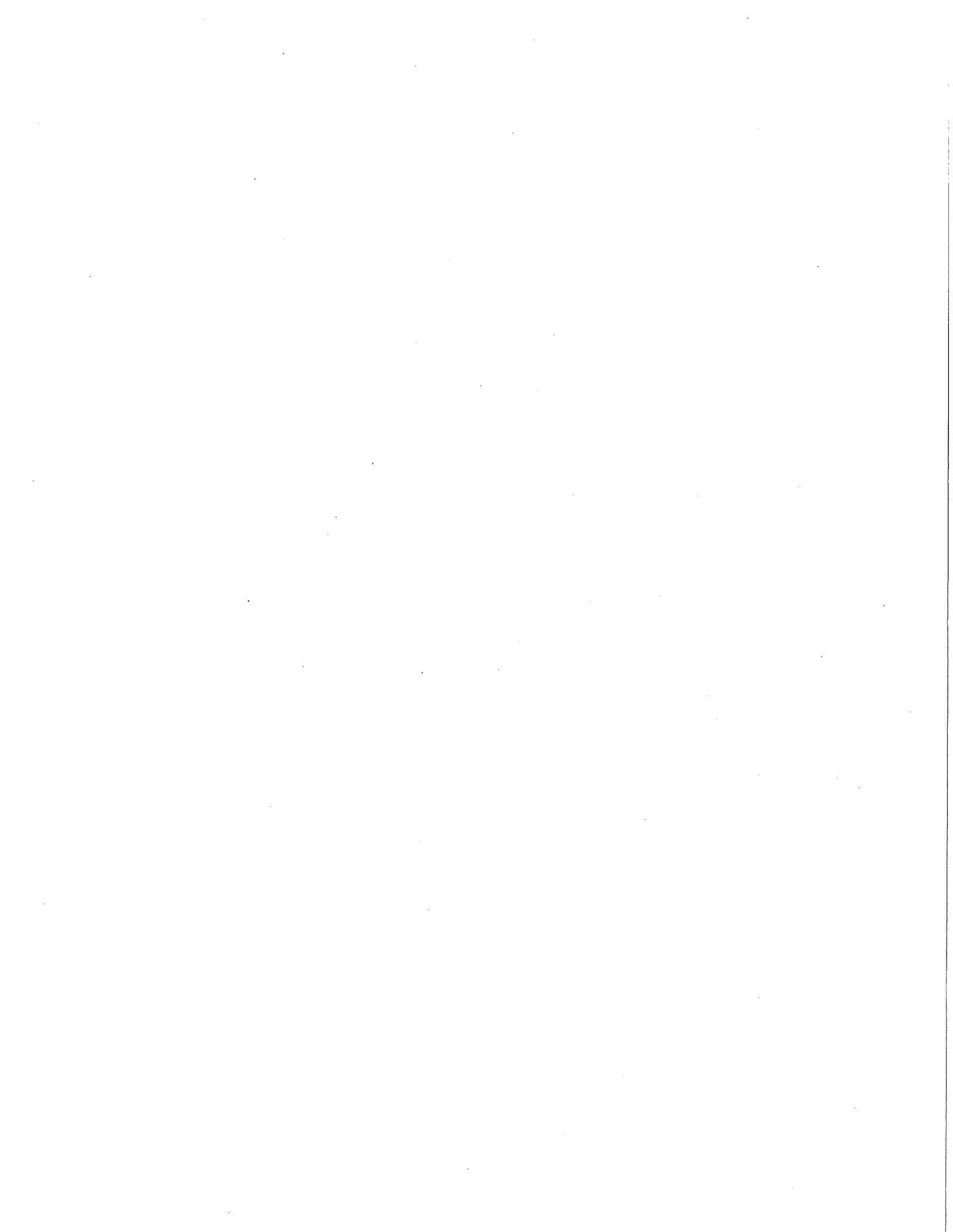
Table 34: Sonoma and Mendocino Economic Impact from Regulation, 30% Crop Loss

Category	Lost Jobs	Lost Business Income (Annual)	Lost State and Local Taxes (Annual)
Due to Vineyard Losses	2,845	\$318,031,943	\$16,617,905
Due to Winery Losses	22,174	6,294,883,144	423,141,499
Due to Tourism Losses	1,154	\$134,978,190	\$8,878,116
Due to Allied Industries Losses	1,573	154,277,034	10,735,314
Mitigation* (Wind/Monitoring Equipment)	+1,110	+173,951,579	+7,435,770
Totals (lost jobs and annual \$)	26,637	\$6,728,218,732	\$451,937,064
		Lost Value	Lost Property Taxes
Lost Land Value		\$341,094,000	\$3,752,000

***Assumes no farmers go out of business before they convert frost protection to wind**

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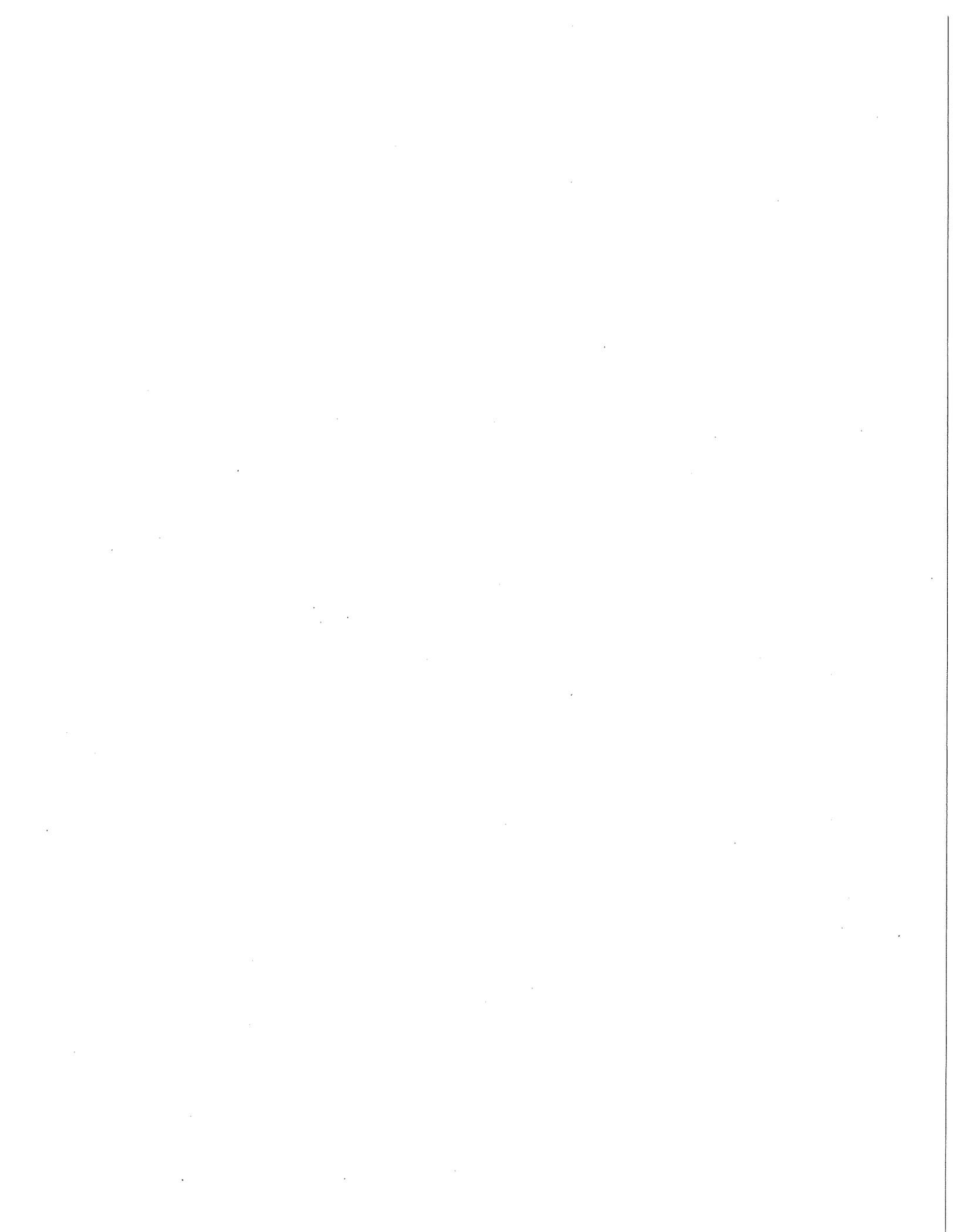


Attachment C

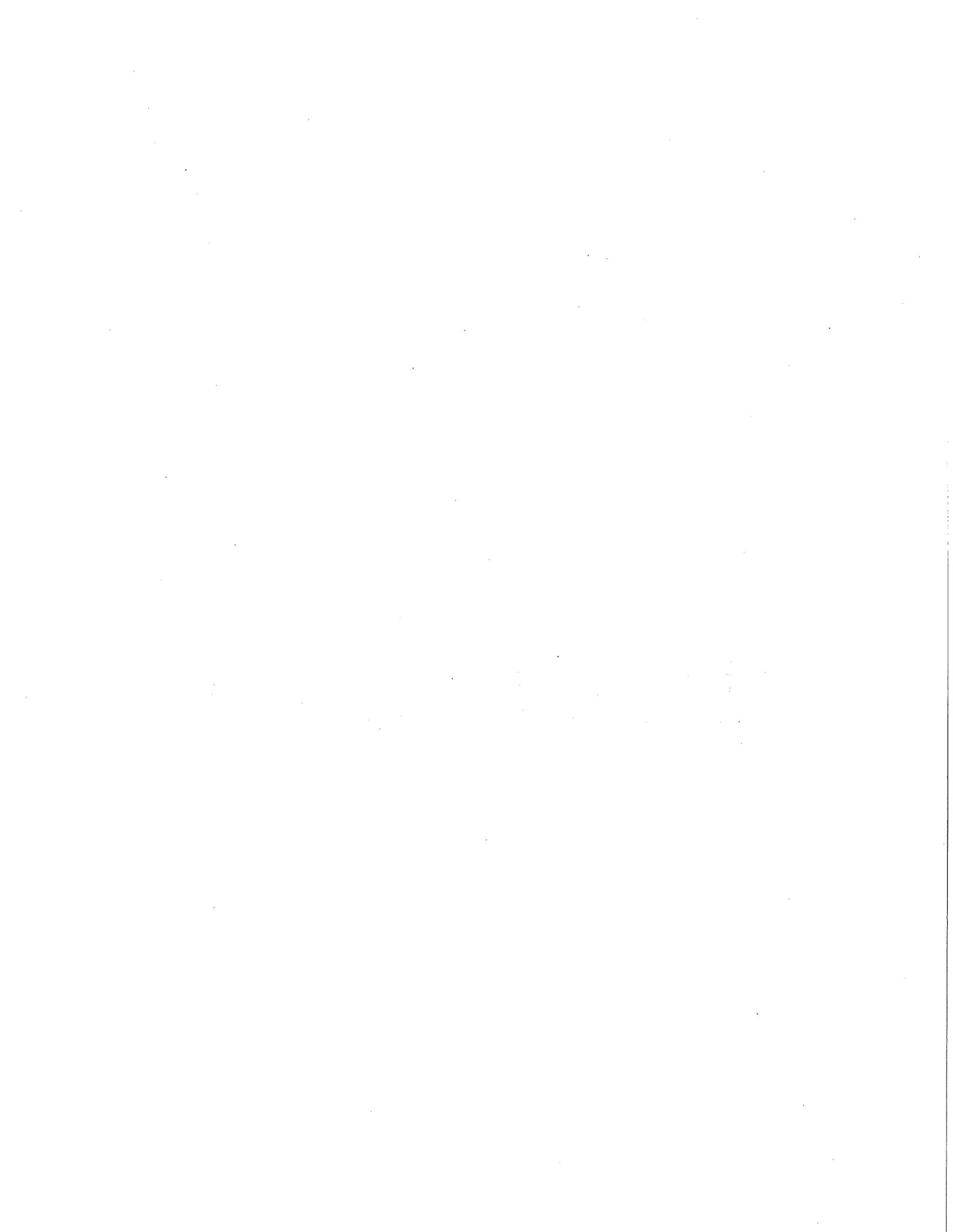


**Errata Sheet to Connect Preliminary Report (10/18/10) to Final Report (10/27/10)
Economic Impact of Frost Protection**

1. **Page 2:** Table 3 title has been changed per change #8 below in Table of Figures and Tables.
2. **Page 6:** Bold formatting removed from Table EX-2 under "Lost Jobs" header for vineyards and wineries.
3. **Page 9:** Last bullet point on page, changed "the North Bay" to "affected counties".
4. **Page 11:** Four lines from bottom changed "15,581" to "13,858"
5. **Page 13:** Four lines from bottom changed "over 17%" to "approximately 15.7%" and two lines from bottom changed "12.1%" to "9.6%" to reflect changes to Table 1 in #6 below.
6. **Page 14:** Table 1 data changed to reflect all wine grape acreage, where original showed only bearing red wine acreage.
7. **Page 15:** In sentence that begins with "Table 3 shows ...", changed to clarify that Table 3 shows grapes purchased from vineyards not all grapes processed.
8. **Page 16:** Title of Table 3 changed for clarify that the data represent purchased not all grapes harvested and processed.
9. **Page 17:** Table 4 asterisks removed from table.
10. **Page 20:** Second paragraph changed for clarity concerning Russian River Valley acreage used in land value calculations (13,858 acres replacing 15,581 acres), including sum of acreage based on changes.
11. **Page 33:** In Table 13, the value of total winery tourism estimates for California was changed from 2,471.97 to 16,992.27 and the values for "All Others" were changed to reflect this change to total tourism volume.
12. **Page 40:** Table 17 formatting change: change font of industries under "Industry Titles" header to Calibri, 11pt.
13. **Page 41:** Table 18 formatting change: change font of industries under "Industry Titles" header to Calibri, 11pt.
14. **Page 41:** Table 19 formatting change: change font of tax categories under "State and Local Taxes" header to Calibri, 11pt.
15. **Page 42:** Table 20 formatting change: change font of tax categories under "State and Local Taxes" header to Calibri, 11pt.
16. **Page 44:** Table 23 formatting change: change font of tax categories under "State and Local Taxes" header to Calibri, 11pt.



Attachment D



Home > News & Features > News

Russian River Rules

As government officials argue over water use in Sonoma and Mendocino, grapegrowers worry their crop will freeze

Harris Meyer

Posted: November 3, 2010

To grapegrowers, few things are as terrifying as a late spring frost that threatens to kill off vine buds just as growing season is starting. The most common form of protection is spraying the vines continuously with water—the heat generated as the resulting ice forms shields buds from cold air. But what if there is no water?

A battle between California vineyard owners and government regulators over using Russian River water for frost protection is heating up. Late last month, federal officials rejected a Sonoma County proposal for monitoring and reducing river water usage. The feds believe the proposed rules were insufficient. At the same time, a winery released a study claiming new restrictions would cost the state economy more than \$2 billion a year.

The Russian River flows through some of California's top vineyards on its 110-mile route from Mendocino County to the Pacific. But thanks to three years of drought, parts of the river nearly ran dry last summer. That's made it the latest battleground in a growing number of fights over water rights, as Western states try to balance the needs of growing populations, farms and environmental concerns. In April 2008, growers' heavy diversion of river water to protect vines during severe frosts lowered river levels enough to kill significant numbers of protected salmon. The National Marine Fisheries Service and California's State Water Resources Control Board announced plans to regulate use of Russian River water in Mendocino and Sonoma Counties. Several environmental groups signaled that they might file a lawsuit under the Endangered Species Act demanding that the state board protect the fish.

In response, grower groups and local officials offered plans to better monitor water levels and try to devise ways to minimize diversions. Last year, some growers built storage ponds, which can be filled when the river is high and used during frosts. Sonoma County officials proposed an ordinance requiring growers to obtain an annual permit for frost water use and provide a usage plan. The Mendocino County irrigation district implemented new stream gauges, a reservoir release schedule, better frost forecasting and other measures to reduce water demand.

But in an Oct. 19 letter to the Sonoma Board of Supervisors, the fisheries service shot down the draft ordinance because it "lacks the means to establish a meaningful monitoring program and a transparent process." Then the state water board announced a Nov. 17 public hearing in Santa Rosa to discuss a proposal to bar diversions from the Russian River system from March 15 to May 15 unless growers comply with an approved water management program protecting the fish. Board spokesman William Rukeyser said his agency is in the beginning stages of the rulemaking process and is "at least months away" from finalizing any rule. "We can't have uncoordinated pumping from the river during frost events," he said. Any new coordinated pumping system, he added, must have universal participation, but the board is open to various approaches.

But Sean White, general manager of the Mendocino County irrigation district, expressed frustration with the federal and state agencies. "The bar seems to be moving higher and higher, so there's a de facto prohibition on the use of frost water," he said. "If you can't frost protect, you're dead."

On Oct. 26, Russian River Valley winery Williams Selyem released a study it commissioned by a Sonoma State University economist showing that restricting frost water use could cost the California economy more than \$2 billion a year if vineyards lost 10 percent of their crop due to frost—including \$143 million in lost tax revenue, \$113 million in decreased land values and more than 8,000 jobs. Those losses would be magnified if growers lost 30 percent or more, which some experienced during the 2008 frosts, according to John Dyson, Williams Selyem co-owner.

"We depend on this water five to 15 nights a year, when it's absolutely critical for the grape crop," Dyson said. "We don't believe we make any difference in the height of the river when we pump for four to five hours at night. Let's balance the needs of the fish, the farmers and the municipal water users. I don't understand why we can't figure out a plan without this draconian rule."

But Rukeyser called Dyson's study findings "bizarre," based on the misconception that the water board wants to completely ban frost water pumping. "If you do an analysis based on faulty assumptions, you get faulty conclusions," he said. "It's garbage in, garbage out."