

**Sotoyome Resource Conservation District
Public Agency of the State of California**

January 1, 2007

**Addendum Number 1 to the
Mitigated Negative Declaration for the
Giant Reed (*Arundo donax*) Removal and Riparian Habitat Restoration in the
Russian River Watershed**

PURPOSE

This addendum to the Mitigated Negative Declaration for the Giant Reed (*Arundo donax*) Removal and Riparian Habitat Restoration in the Russian River Watershed has been prepared to include the use of the herbicide Imazapyr amongst the invasive weed removal techniques utilized in the *Arundo donax* eradication program currently being implemented by the Russian River Team Arundo (RRTA). Section 15164 (b) of the California Environmental Quality Act (CEQA) Guidelines states that an Addendum to an adopted Negative Declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 (calling for the preparation of subsequent EIR or Negative Declaration) apply.

This Mitigated Negative Declaration Addendum demonstrates that the environmental analysis, impacts, and mitigation requirements identified in the original declaration (SRCD 2004) remain substantively unchanged by the modification described herein, and supports the finding that the proposed activity does not raise any new issues and does not exceed the level of impacts identified in the previous Mitigated Negative Declaration.

BACKGROUND

Russian River Team Arundo (RRTA) is comprised of Circuit Rider Productions, Inc. (CRP), in collaboration with the Sotoyome Resource Conservation District (SRCD) and the Mendocino County Resource Conservation District (MCRCD). The mission of RRTA is to remove giant reed (*Arundo donax*) from the Russian River watershed and restore riparian habitat in invaded sites.

In accordance with CEQA (Public Resources Code Section 21000 et seq.), and the updated State CEQA Guidelines (Title 14, Chapter 3, Section 15000, et seq., California Code of Regulations), the Sotoyome Resource Conservation District, as the lead California Environmental Quality Act (CEQA) agency, prepared a Mitigated Negative Declaration and Notice of Determination, (State Clearinghouse Number 2004092059), approved by the Board of Directors on October 15, 2004.

Program implementation began in June of 2003, and approximately 50 acres of giant reed have been removed to date, with 25 acres completely eradicated.

To date, weed removal has been conducted utilizing removal methods as laid out in the original Mitigated Negative Declaration. These methods include above-ground biomass removal, using hand tools and a limited use of mechanized equipment. Follow-up treatments include root removal, tarping, and/or the application of a glyphosate-based herbicide to cut stems in order to kill the giant reed. Areas of infestation are then re-vegetated using locally collected native plants.

Herbicide application has been restricted to use in areas where tarping is not a feasible option. When applied, herbicide is painted on cut stumps in the summer and fall months when the cut and paint method has the highest *Arundo* mortality rate and the bird nesting season is over. This method is effective on a small scale, and will continue to be utilized where conditions indicate. However, large-scale application of herbicide in this manner has not proved efficient.

EVALUATION OF MODIFICATION

The Initial Study and Mitigated Negative Declaration adopted on October 15, 2004 evaluated the use of glyphosate herbicide in giant reed removal efforts. In an effort to increase effectiveness of the removal techniques, and reduce the amount of herbicide applied overall, RRTA will include the use of Imazapyr herbicide in a cut and spray method to treat regrowth of *Arundo donax* (giant reed) plants in its removal plan. The use of this technique would allow pesticide applicators to chemically treat large monocultures of giant reed, with a reduction in effort and amount of herbicide applied long-term compared to the currently utilized cut and paint technique.

Several large-scale invasive weed eradication efforts have compared imazapyr application effectiveness favorably to glyphosate. Efforts to control smooth cordgrass (*Spartina alterniflora*) in the San Francisco Estuary and in Washington State's Willapa Bay have successfully used imazapyr in their control efforts. The Willapa project began using imazapyr in 1998 after glyphosate had proved ineffective, and found that the *Spartina* was effectively controlled using very low application volumes (0.84kg/ha), one-tenth of those used for less effective applications of glyphosate (Patten, 2002a; WSDA, 1999).

Team Arundo, a southern California group specializing in *Arundo* control, has experimented with Habitat®, an imazapyr formulation approved for aquatic use. The group found low volume foliar treatments to be effective at one-tenth the application rates of glyphosate sprays, and for at least half of the cost per acre (Neill, 2006). The group's northern counterpart, Team Arundo del Norte, has also used ground applications

of imazapyr and found them to be the most effective chemical control against *Arundo* (Team Arundo del Norte, 2006).

Manufacturer experiments on *Arundo* have shown that application rates of imazapyr of 64 oz/acre, using 0.5% methylated seed oil as a surfactant, had 80-90% kill rates (Bean, J., 2004)

Imazapyr works by inhibiting the enzyme that synthesizes branched-chain amino acids, a process only occurring in plants. The herbicide is considered non-toxic to birds, mammals, fish, honeybees, aquatic invertebrates, and non-vascular aquatic plants, as determined through toxicity testing conducted by the EPA as part of its re-registration. It does not appear to bioaccumulate in these species (USEPA, 2006).

The use of imazapyr has been shown to pose risks of concern for non-target terrestrial plants and aquatic vascular plants. (USEPA, 2006). These risks will be mitigated by several factors:

- RRTA will use imazapyr formulations approved specifically for aquatic use, such as Habitat®
- RRTA will conduct spray treatments only in appropriate weather conditions to minimize impact to nontarget plants. Other applicators have noted that imazapyr spray does not volatilize readily in the field (Tu et al, 2001).
- The majority of the *Arundo* infestation within the watershed occurs in monoculture stands. Imazapyr spraying of *Arundo* will only be carried out in infestations where exposure to native vegetation will be minimal.
- Application of Imazapyr shall be done in accordance with label instructions at all times.
- Also, spraying will not occur within 25 feet of active water channels to reduce exposure risks to aquatic vascular plants. If it should enter the water column, imazapyr is quickly photodegraded by sunlight with an average half-life of two days (Mallipudi et al. 1991).

Imazapyr has also been shown to be persistent in soils, with a half-life ranging from one to five months (USEPA, 2006; Tu et al, 2001). The risk to native vegetation as posed by this persistence will be addressed as follows:

- As *Arundo* grows in monoculture stands with shallow root systems, this persistence is not predicted to significantly affect native vegetation. Where found in mixed vegetation, a cut-and-paint glyphosate application will be applied.

- Any active revegetation of the infestation site will be carried out at least one year after the imazapyr application, to allow for sufficient degradation.
- Wherever possible, methods other than herbicide will continue to be utilized to eliminate giant reed.

Potential negative effects of the cut and spray technique (i.e., spray drifting onto non-target plant species) will be minimized through strict adherence to the already adopted Best Management Practices (BMP's) utilized by project staff. These BMP's include the continued implementation of the biological mitigation measures outlined in the Mitigated Negative Declaration (Section 4, subsection 4.5.2, BIO-1 through BIO-12), with specific emphasis on BIO-5.

BIO-5: All Activities requiring herbicide treatment would:

- *Appropriately time work so that herbicides are not applied during the wet season to avoid potential impacts to downstream vegetation, and to avoid impacts to fish and wildlife species.*
- *RRTA shall consult the National Weather Service and allow at least four days of dry weather before application of herbicide.*
- *Treatments shall use a glyphosate-based herbicide including Rodeo and/or Round-up.*

This mitigation measure is henceforth modified as follows:

BIO-5: All Activities requiring herbicide treatment would:

- *Appropriately time work so that herbicides are not applied during the wet season to avoid potential impacts to downstream vegetation, and to avoid impacts to fish and wildlife species.*
- *RRTA shall consult the National Weather Service and allow at least four days of dry weather before application of herbicide.*
- *Treatments shall use a glyphosate-based herbicide including Rodeo and/or Round-up, or an imazapyr-based herbicide including Habitat.*
- *Prevent cut and spray within twenty-five feet of the wetted channel to avoid potential spray drift reaching the water surface. In areas deemed at risk for spray drift, based upon weather and wind conditions and distance from surface water as defined above, only the tarping, or cut and paint treatment methods will be used.*

EXPLANATION OF THE DECISION NOT TO PREPARE A SUBSEQUENT MITIGATED NEGATIVE DECLARATION

CEQA Guidelines Sections 15162 and 15164 set forth the criteria for determining the appropriate environmental documentation, if any, to be completed when there is a pre-

existing adopted Mitigated Negative Declaration covering a project. SRCD provides the following findings pursuant to these criteria as required by CEQA Guidelines Section 15164 (e).

CEQA Guidelines Section 15162 (a) states that when a Negative Declaration has been adopted for a project, no subsequent Environmental Impact Report (EIR) shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in light of the whole public record, one or more of the following:

1. Substantial changes are proposed in the project which will require major revisions of the previous negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

Discussion: SRCD's Mitigated Negative Declaration (State Clearinghouse number: 2004092059) does not include the use of the herbicide Imazapyr, but does include the use of the herbicide glyphosate. As discussed above, application of glyphosate has proved inefficient and laborious in killing the giant reed. Because of this, herbicide treatments span multiple years. Incorporating imazapyr where appropriate will serve to reduce the contact time needed to kill the weed, thereby improving efficiency. Evaluations in the initial study were based on information available in October 2004, which indicated that glyphosate formulated for aquatic use and applied using the cut and paint method was the best option for *Arundo* removal efforts. RRTA now recognizes that the use of managed spraying will not only improve the kill ratio of giant reed eradication activities, but will also reduce the amount of herbicide applied over the life of the project, thereby reducing any potential impacts associated with long term herbicide application.

Use of Imazapyr in its aquatic formulation Habitat® will minimize potential impacts from project operation to less than significant levels. Habitat is a specific formulation of imazapyr, a broad-based herbicide, which is registered for use in California aquatic systems. Habitat has been used widely on *Arundo* in Southern California, and results show favorable results. One reported benefit of using imazapyr instead of glyphosate, is that imazapyr requires much less herbicide to effectively kill *Arundo*. Imazapyr can kill arundo clumps with 20% contact, meaning that not every stalk needs to be sprayed, nor the entirety of any individual stalk. Glyphosate requires nearly complete herbicide contact to kill giant reed. *Arundo* eradication efforts that use only spray programs estimate imazapyr application rates to be about 10 gallons of spray mixture per acre, compared to 60-100 gallons of glyphosate spray mixture per acre (Neill, 2006).

Current applications of glyphosate using the cut-and-paint method are time consuming, and require a second removal and disposal of the re-growth canes, usually involving dragging the cut canes through the riparian habitat to a chipper. This can cause added

disturbance to the riparian area, especially when repeated over multiple seasons. The need for repeated treatments also delays re-vegetation efforts, and therefore delays bank stabilization and riparian habitat improvement. Imazapyr spraying not only allows for a shorter timespan before the invasive weed is eradicated and native vegetation restored, but the actual application process of spraying re-growth can have less impact than the second cutting and chipping required by the glyphosate application.

More importantly, experiences of RRTA and other agencies performing *Arundo* removal have demonstrated that a smaller quantity of active ingredient will be required to eradicate the infestation. During the imazapyr consideration process, RRTA implemented an experiment testing the effectiveness of Habitat®, and compared it to the cut-and-paint application of glyphosate.

In the trial, a 31,285 sq.ft. monoculture stand of *Arundo* re-growth adjacent to a dry seasonal tributary was sprayed with a 5% solution of Habitat®, using a 1% methylated seed oil as a surfactant. Spraying was done to achieve approximately 20% cover as recommended in previous trials (see Neill, 2006).

A comparison of this trial with first-, second-, and third-year glyphosate sites is shown below. Although cut-and-paint application rates of glyphosate were lower than imazapyr spray rates for the first year of application, repeated treatments required for glyphosate eventually resulted in much higher herbicide use at those sites. The third year sites used to calculate the averages below are still in need of additional treatments. Although only in its first year, experience from other groups as sited above indicates that a much higher kill rate (80-90%) is expected with the imazapyr treatment. In addition, the application rate of 393 oz. a.i./acre at the imazapyr test site is much higher than what will normally be used, as the *Arundo* had reached heights of 20 ft. by the time the test was implemented. Imazapyr spraying would normally occur when the re-growth is only 3-5 ft.

The cut-and-paint glyphosate applications have also proved enormously labor-intensive compared to spraying, as indicated by the costs per acre below. As these figures were calculated using person-hours onsite, the true cost of repeated glyphosate applications would be greater as it would also include travel costs of time and mileage.

Economic comparison of imazapyr and glyphosate applications on *Arundo donax* infestation sites:

	oz./acre	labor costs for herbicide applic/acre
Imazapyr trial site	393	\$1,034
1 st yr. Glyphosate sites	261	\$23,729

2 nd yr. Glyphosate sites	412	\$49,159
3 rd yr. Glyphosate sites	1,043	\$109,074

The need for repeated treatments also increases management and monitoring costs of each project, factors not included in the above figures.

Use of Imazapyr will not result in introduction of herbicide into the waterway, and therefore will not create any new impacts. The potential impacts to stream habitat resulting from herbicide application (glyphosate) were analyzed in the October 2004 Mitigated Negative Declaration and Initial Study. Based on the discussion above, it is determined that the use of an imazapyr-based herbicide in a cut and spray application method will not result in effects greater than those of the glyphosate-based herbicide. Consequently, no new significant effects are introduced and impacts to stream habitat remains less than significant.

2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

Discussion: Herbicide information collected during the original project impact analysis indicated that glyphosate was not present in surface waters when applied in accordance with the manufacturer’s recommendations, and utilizing existing BMP’s. Weed control efforts using imazapyr on aquatic species have compared it favorably to glyphosate, with water sampling indicating the imazapyr degraded quickly in both water and sediment, due to its rapid photodegradation in aquatic solutions (Patten, 2003). Water quality monitoring of the Willapa Bay sites showed samples collected directly after the application had negligible amounts (8.8 ppb) of imazapyr, while those collected after two days showed no detectable levels. Therefore, use of imazapyr yields no additional impacts to aquatic resources.

Further, based upon known trials and literary review, imazapyr yields a higher kill ratio utilizing reduced amounts of herbicide than was required utilizing glyphosate. Use of imazapyr in a cut and spray method where appropriate will reduce the amount of herbicide needing to be applied, and therefore will reduce the risk of herbicide impacting surface waters and habitat respectfully. This will reduce the project’s operational effects on water quality to less than significant levels.

No new significant environmental effects or increases in the severity of previously identified significant effects will occur with the use of imazapyr for treatment of cut *Arundo donax* stalks.

3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the negative declaration was adopted (October 2004), shows any of the following:

a. The project will have one or more significant effects not discussed in the negative declaration.

Discussion: Cut-and-paint glyphosate application, while somewhat effective in controlling small *Arundo* stands with repeated treatments, has proved cost-prohibitive and impractical for large-scale mainstem infestations. A spray application with imazapyr will require less herbicide use overall and minimize impact through more efficient control. See discussion for #1 and #2 for more information.

b. Significant effects previously examined will be substantially more severe than shown in the negative declaration.

Discussion: None of the environmental effects that were identified in the Mitigated Negative Declaration and Initial Study will be substantially more severe as a result of the inclusion of Imazapyr. See discussion for #1 and #2 for more information.

c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

Discussion: The addition of the Imazapyr herbicide will not alter the intent or application of any of the mitigation measures described in the Mitigated Negative Declaration or Initial Study (SRCO 2004). The Mitigated Negative Declaration and Initial Study identified no infeasible mitigation measures.

d. Mitigation measures or alternatives which are considerably different from those analyzed in the negative declaration would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Discussion: RRTA does not decline to adopt any mitigation measures.

CONCLUSION

In preparing this Addendum, all of the potential impacts identified on the CEQA Environmental Checklist Form were considered. For all impact areas, a preliminary

review indicated that the proposed modification (inclusion of Imazapyr in removal efforts) is consistent with the original design of the project and therefore would have no impact(s) not already identified in the Giant Reed (*Arundo donax*) Removal and Riparian Habitat Restoration in the Russian River Watershed Mitigated Negative Declaration.

In summary, the analysis concludes that none of the conditions described in Section 15162 of the CEQA Guidelines requiring preparation of a Subsequent Mitigated Negative Declaration have occurred. Thus, this Addendum to the adopted Mitigated Negative Declaration has been prepared in accordance with CEQA Guidelines, Section 15164. The inclusion of the herbicide Imazapyr in *Arundo donax* removal techniques addition does not introduce new significant environmental effects, increase previously identified significant environmental effects, make previously infeasible mitigation measures feasible, or require adoption of infeasible mitigation measures. The application of Imazapyr where appropriate, utilizing pre-determined Best Management Practices, does not alter the findings in the original Initial Study or Mitigated Negative Declaration (SRCD 2004).

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