

# **2010 DRY CREEK RED SESBANIA CONTROL PROGRAM MONITORING REPORT**

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## Executive Summary

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The Dry Creek Red Sesbania Control Program maintenance phase, initiated in 2007, continued in 2010 with two control sweeps of the watershed in July and October. A monitoring visit was conducted in July before the first sweep and in October after the last sweep was complete. The October monitoring visit indicated that less than 1% of the Sesbania population remained. Therefore, the 2010 program met its success criterion. A comparison of 2008, 2009 and 2010 monitoring results and control data is presented. Additionally, maps prepared as part of a statewide Sesbania mapping project, which include Dry Creek locations, are included.

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# Acronyms and Abbreviations

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|                 |   |
|-----------------|---|
| Phase 1 Project | Dry Creek Watershed Red Sesbania Control Project, Phase I |
| SAFCA           | Sacramento Area Flood Control Agency                      |
| Sesbania        | red sesbania ( <i>Sesbania punicea</i> )                  |

# 2010 Dry Creek Red Sesbania Control Program Monitoring Report

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## Introduction

The Sacramento Area Flood Control Agency (SAFCA) conducted an invasive plant control program for red sesbania (*Sesbania punicea*)(Sesbania) in the Dry Creek watershed from 2004 to 2006. The project was known as the Dry Creek Watershed Red Sesbania Control Project, Phase I (Phase 1 Project). The Phase 1 Project was funded by a California Department of Water Resources Proposition 13 Flood Protection Corridor Program grant administered by SAFCA. Since 2007, the maintenance phase of the removal program has been funded through a partnership between SAFCA, Sacramento County, Placer County, and the cities of Sacramento and Roseville. The project is administered by Placer County Resource Conservation District. The goal of the project is to reduce the potential for flooding in Dry Creek and to improve wildlife habitat in the watershed. The objective is to continue to remove and control seedlings of Sesbania, anticipating a diminishing level of effort over time.

This report presents the results of the 2010 monitoring effort. Monitoring was conducted by ICF International in July and October, 2010. The 2010 Dry Creek Sesbania removal contractor was Agri Chemical and Supply, Inc., of Salinas, California. Gary Omori, Agri Chemical's Salinas office Area Manager, directed the removal effort. Agri Chemical conducted two control "sweeps" of the watershed and monitoring was conducted before sweep 1 and after sweep 2.

The contract performance criterion was:

**Table 1. Annual Success Criterion**

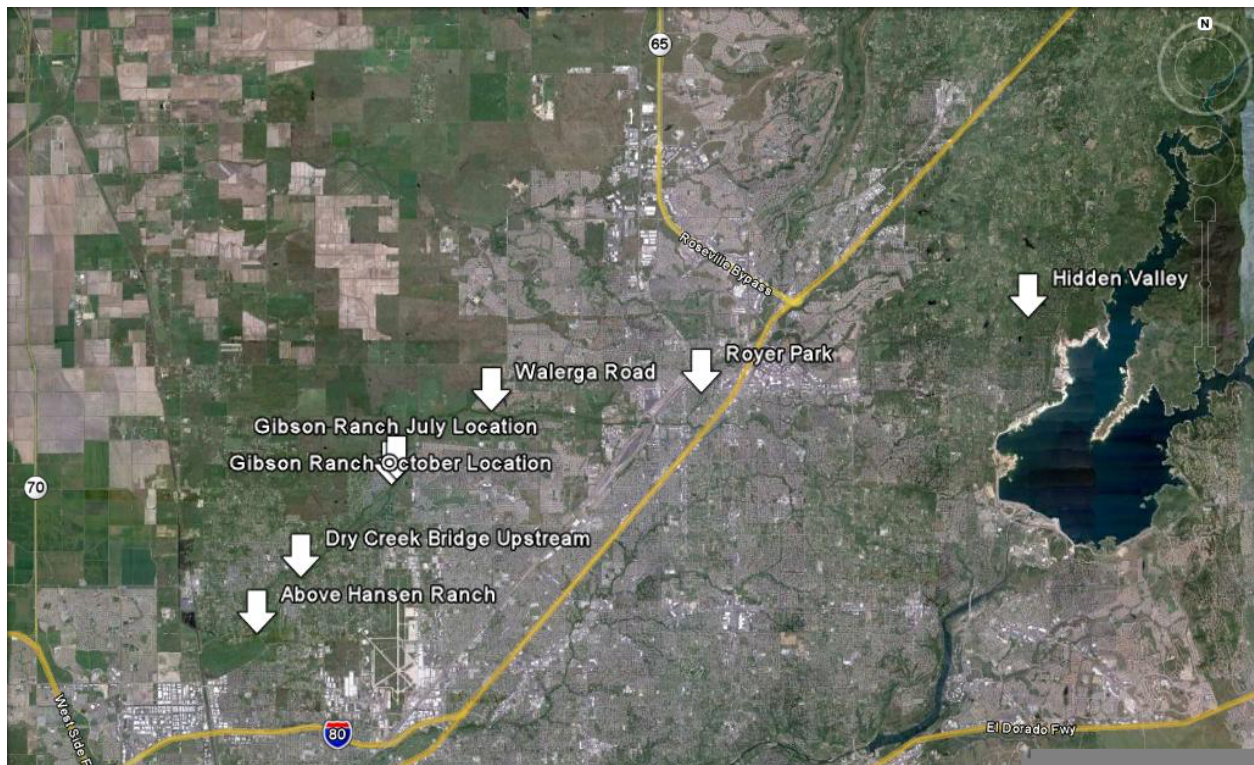
| Year          | Anticipated Condition at Start of Work Year                    | Success Criteria at End to Work Year         | Overall Goal   |
|---------------|--|--|--|
| Year 1 (2008) | 10-30% cover in lower watershed, >10% cover in upper watershed | Removal of 99% of red sesbania by October 15 | Eradication of Red Sesbania; <1% remaining in treatment area at end of program |

## Methods

In 2008, the Dry Creek Sesbania monitoring program methods changed to meet requirements of grants and to provide better information on the condition of the infestation. In previous years, a series of over 50 monitoring photographs were taken throughout the watershed. These photographs were useful during the early phases of the project when large shrubs were being removed, creating obvious "before and after" photographs. However, for the past few years the emphasis of control work has been on seedling removal which is not as easily monitored using photographs alone. The performance criterion for the project is removal of 99% of the Sesbania cover, and a quantitative means of assessing cover before and after treatments was needed. The methods developed in 2008 were repeated again in 2009 and 2010, and a monitoring protocol was developed (Appendix A).

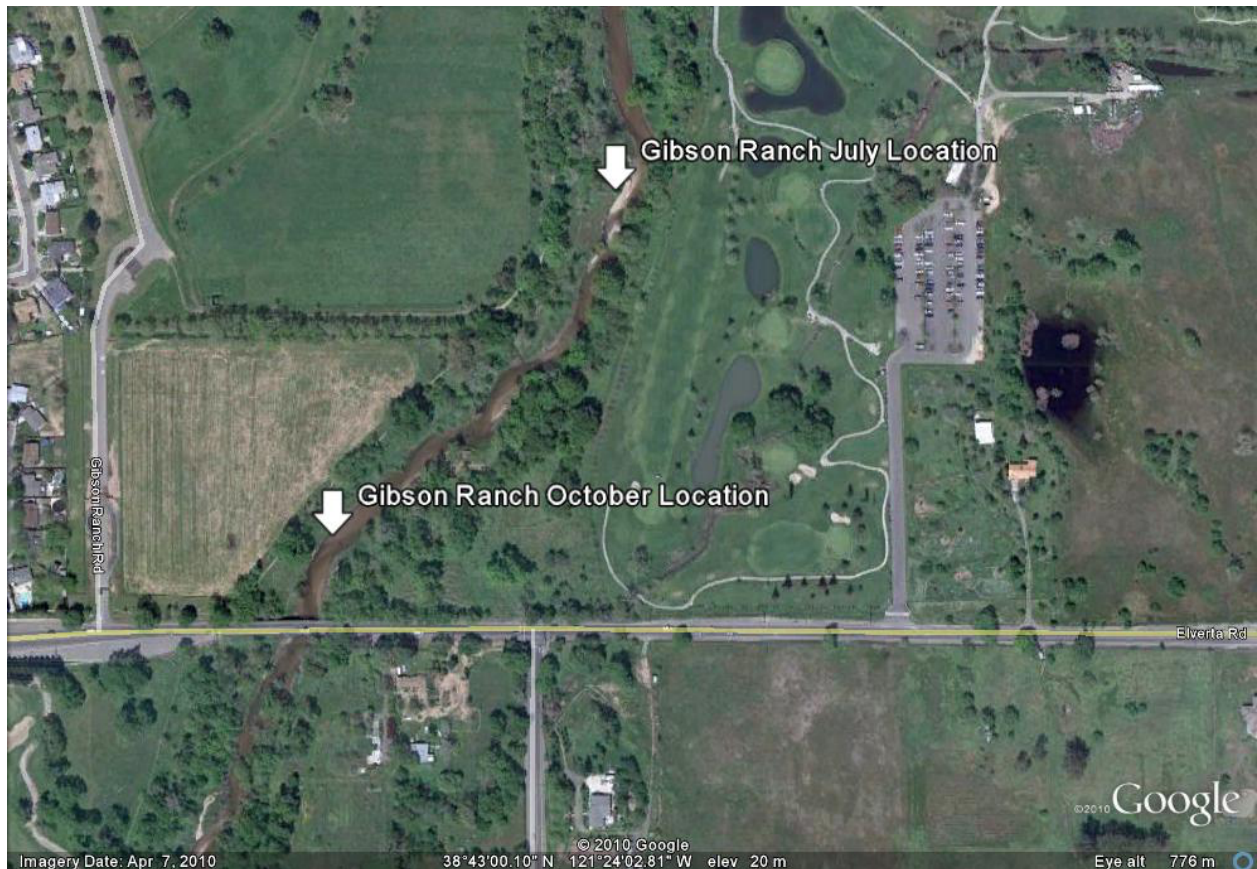
In 2010, the *Sesbania* infestation was monitored in six locations, and data was collected in four 1 meter square quadrats at each location. Sampling locations with sand bars exposed during low flows were chosen to represent the upper, middle and lower watershed (see Figure 1 and photographs in Appendix B). The monitoring location at Gibson Ranch changed slightly in 2010 because after the first monitoring visit Gibson Ranch, a Sacramento County Park, was closed. The two locations sampled are shown in Figure 2. Several of the locations in the upper watershed (Royer Park in Roseville and downstream of Walerga Road) had few *Sesbania* plants, but were chosen to represent the condition in that portion of the Dry Creek watershed. Our choice of quadrat locations within the sandbar was also biased – we tried to choose quadrats with at least one live or dead *Sesbania* plant in them, even if the majority of the sandbar was free of *Sesbania* plants. This resulted in a higher cover classification than if randomly placed quadrats were used. However, the sampling unit was really the entire sandbar and the *Sesbania* occurring there was the focus of the monitoring effort. Permanent quadrats were also not chosen because of the dynamic nature of the river system.

**Figure 1. Dry Creek *Sesbania* Monitoring Locations**





**Figure 2. Close-Up of Gibson Ranch 2010 Monitoring Locations**



During monitoring visits we took photographs of each quadrat and photographed a six foot tall pole marked off in one foot intervals to record overall vegetation height. We collected percentage cover data in each quadrat for live *Sesbania* alone and for all other live plant species present. The cover classes used are listed in Table 2. We counted all live *Sesbania* plants in the quadrat and measured the height of 10 plants to determine mean height per quadrat.

The first monitoring visit was completed on July 2, 2010 by Ramona Robison, Nita Barve, Megan Drinnan and Christina Owens of ICF International. Agri-Chemical and Supply, Inc. conducted their first sweep July 19 through 24 and their second sweep October 4 through 8, 2010. The final monitoring visit was completed on October 22, 2010 by Ramona Robison, Nita Barve and Christina Owens.

## Results and Discussion

Photographs of the “before and after” condition of the *Sesbania* infestation in Dry Creek and its tributaries are presented in Appendix B. The table below summarizes the cover classes observed in July (before) and October (after). Data sheets with all quadrat information are included in Appendix C.

In 2010, the largest number of live *Sesbania* plants per square meter was at the sandbar north of Dry Creek Road while in 2009 the highest number of live *Sesbania* were observed on the SAFCA property north of Hansen Ranch. Note that the mean number of plants in both locations was lower in 2010, however, the overall mean of all 6 sampled locations did not decrease over the three years (Table 3). During the October visit the largest number of live plants observed in any of the quadrats was 4.25 at Hidden Valley.

The cover class information presented in Table 2 presents the highest and lowest cover classes observed in the four quadrats at each monitoring location. It should be noted that sample locations within the monitored sandbars were not randomly chosen. An attempt was made to place each quadrat in a location with either a live or dead *Sesbania* plant. All locations had 5% cover or less in October. When live *Sesbania* plants were observed during monitoring visits we measured them and then pulled them by hand. There were so few plants remaining in the October visit that we were able to remove all live plants in the six monitoring locations. Most of the quads observed in October had 1% or less *Sesbania* cover with only four quads containing 5% or less *Sesbania* cover overall.

**Table 2. 2010 Dry Creek *Sesbania* Monitoring Data Summary**

| Monitoring Location                 | July Cover Classes | October Cover Classes | July Mean Number of Plants per Meter | October Mean Number of Plants per Meter |
|-------------------------------------|--------------------|-----------------------|--------------------------------------|---|
| Hidden Valley, Granite Bay          | 3, 2, 3            | 2, 2, 1, 2            | 23                                   | 4.25                                    |
| Royer Park, Roseville               | 2, 3, 3, 3         | 1, 1, 1, 1            | 3                                    | 1.25                                    |
| Walerga Road, Placer County         | 3, 2, 2, 2         | 1, 1, 1, 1            | 12                                   | 1                                       |
| Gibson Ranch, Elverta*              | 3, 3, 3, 3         | 1, 1, 1, 1            | 28                                   | 1                                       |
| Above Dry Creek Road                | 3, 3, 3, 3         | 1, 1, 1, 2            | 38.25                                | 1                                       |
| Upstream of Hansen Ranch, Rio Linda | 3, 2, 3, 3         | 1, 1                  | 23.25                                | 1                                       |

Cover Classes: 0-1%= 1; 1-5%= 2; 5-25%= 3; 25-50%= 4; 50-75%= 5; 75-95%= 6; 95-100%= 7

\* Monitoring location was different in July and October due to closure of Gibson Ranch.

Outside the six monitoring locations, no *Sesbania* plants were observed by monitors. One location in a housing development off Maccardy Road which used to support mature plants was free of *Sesbania*, as were areas upstream of Elkhorn Road.

In 2010 we again collected information on the plant species associated with *Sesbania* and results were similar to 2008 and 2009. Many quadrats contained grasses, sedges (*Cyperus* spp.), rushes (*Juncus* spp.), willows (*Salix* spp.), knotweed (*Polygonum* spp.), fireweed (*Epilobium* spp.), mugwort (*Artemisia douglasiana*), beggar's ticks (*Bidens frondosa*), and valley oak seedlings (*Quercus lobata*). Other non-native and invasive plants were also observed including Himalaya berry (*Rubus discolor*), plantains (*Plantago lanceolata* and *P. major*), cut-leaf geranium (*Geranium dissectum*), cocklebur (*Xanthium strumarium*), sweet clover (*Melilotus* sp.), cudweed (*Gnaphalium* sp.), and Mexican tea (*Chenopodium ambrosioides*).

## Comparison of 2008, 2009 and 2010 Results

The following information compares results of 2008, 2009 and 2010 *Sesbania* monitoring and control efforts on Dry Creek.

**Table 3. Comparison of Mean Number of Sesbania Plants per meter Observed in June 2008, June 2009 and July 2010 at Dry Creek Monitoring Locations**

| Monitoring Location  | 2008 June Mean<br>Number of Plants<br>per Meter | 2009 June Mean<br>Number of Plants<br>per Meter | 2010 July Mean<br>Number of Plants<br>per Meter |
|--|---|---|---|
| Hidden Valley, Granite Bay   | 12  | 16.75   | 23  |
| Royer Park, Roseville  | 2   | 14.75   | 3   |
| Walerga Road, Placer County  | 3.5   | 8.75  | 12  |
| Gibson Ranch, Elverta  | 12.5  | 15.5  | 28  |
| Roy Hayer Park, Rio Linda (2008)<br>Dry Creek Road Upstream (2009<br>and 2010) | 16.8  | 53  | 38.25   |
| SAFCA Property North of Hansen<br>Ranch, Rio Linda                             | 72.5  | 56.3  | 23.25   |
| <b>Overall mean number of plants<br/>per meter</b>                             | <b>19.9</b>                                     | <b>27.5</b>                                     | <b>21.3</b>                                     |

## Other Invasive Species Observations

In 2008, Chinese tallow (*Sapium sebiferum*) seedlings were observed in one quadrat in June and two quadrats in October in Roseville at Royer Park. This species was not observed in monitoring quadrats in 2009, but was detected in one 2010 quadrat. Additionally, palm and camphor tree (*Cinnamomum camphora*) seedlings were observed in the same Royer Park quadrat with Chinese tallow in July, and liquidambar (*Liquidambar styraciflua*) was observed in October in one quadrat.

## Notes on Landowner Access Coordination

In 2010, access requirements were similar to previous years. The procedure has been to send out letters to landowners adjacent to treatment areas before the first sweep is conducted. In addition, some landowners request contact before access and those landowners are called at the specified time before work is conducted (Appendix E). The landowners or managers requiring calls or where calls are suggested are highlighted in yellow. The longest notice required is for the lease grazer at Hansen Ranch, where a week notice is requested if possible. Mike Joseph, a landowner in Roseville, must be contacted before access, and he requested an in-person meeting in 2009 which was attended by the weed removal monitor and Agri Chemical. During the first monitoring visit and the last in 2010, Gibson Ranch, a Sacramento County Park, was closed. County Parks should be contacted before work begins in 2011 to determine how to access the Park. The Hidden Valley access contact has also changed from previous years. The weed removal monitor and Agri Chemical have been coordinating on calling landowners.

## Summary of 2010 Weed Removal Contractor Work

Appendix D contains a summary prepared by Gary Omori, manager of weed removal with Agri Chemical. The following table is summarized from his results. Note that the number of tanks of herbicide used decreased in 2010 compared to 2008 and 2009.

Additionally, progress was made in 2010 in compiling the GIS information collected by Agri Chemical in 2008, 2009 and 2010 into one database. The information is now available as an ArcView shapefile and as Google Earth compatible kml file. This data shows the treatment locations for each year. The number of points in the sesbania treatment database for each year was: 1,131 points (2008), 10,021 points (2009) and 6,537 points (2010).

**Table 4. Dry Creek Sesbania Weed Removal Contractor Summary 2008, 2009 and 2010**

| Removal Dates           | Number of Tanks <sup>1</sup><br>Herbicide Used | Number of Bags <sup>2</sup> of<br>Sesbania Seed Pods<br>Collected | Number of Operator<br>Hours |
|-------------------------|--|---|-----------------------------|
| July 15 to 23, 2008     | 434  | 70  | -                           |
| September 8 to 12, 2008 | 32.5   | 14  | -                           |
| July 20 to 28, 2009     | 230  | 25  | 430                         |
| October 9 to 12, 2009   | 80   | 4   | 200                         |
| July 19 to 24, 2010     | 14   | 147   | 350                         |
| October 4 to 8, 2010    | 8  | 3   | 412                         |

<sup>1</sup> 1 tank load is approximately 4.5 gallons of mixed herbicide solution.  
<sup>2</sup> 1 seed bag is 33 gallons.

## Conclusions

The 2010 treatment year was successful in removing 99% of the germinated Sesbania plants. The contractor also removed all visible Sesbania pods from the floodway, preventing future germination of those seeds. Since the project started in 2004 the focus has been on removal of upstream seed producing Sesbania plants, and given the reduction in seed production each year (i.e., all seed pods removed), the seedbank should continue to decline over time. While results this year are promising, treatments must continue until the population is reduced to low levels. The size of the Dry Creek Sesbania population increased with the heavy rainfall in 2006 due to high water flows bringing seeds from low-flow channel sediments up onto the upper floodplain where they germinated far from the channel. Therefore the level of treatment effort needed in high rainfall years is expected to increase. The comparison of three years of monitoring in Table 3 shows that the number of seedlings of Sesbania germinating per meter remains high, especially in the lower parts of the watershed. It appears from the Agri Chemical information in Table 4 that the amount of herbicide needed to treat plants is decreasing. Since the number of operator hours needed is still high, this may indicate that the number of plants sprayed is lower, because it takes the same amount of time to access the plants given the long river distances included in the treatment area.

Progress was made this year in compiling all the Agri Chemical GIS data into one database. This will be useful in the future as it shows areas within the watershed where the Sesbania infestation is heavier and those areas can be the focus of future control efforts.

Finally, the Dry Creek Sesbania data was added to a state-wide Sesbania map prepared by ICF in summer 2010 (Appendix F). The mapping effort compiled all known Sesbania locations and then re-mapped and collected percent cover information for accessible locations. Dry Creek was shown to be one of the most dense infestations in the state, and appears to be a major source of the seed

contribution from the Sacramento area which is expanding downstream into the San Joaquin Delta. Other areas of the state with dense infestations were Churn Creek in Shasta County, Oroville area and downstream into the Feather River, and the San Joaquin River in Fresno County. The Sacramento and Placer County Dry Creek Sesbania management program is the largest in the state and could serve as a model for other areas in need of a regional management strategy.