Ecosystem Restoration Program - 2002 Proposal Solicitation Package (PSP): Form I - Project Information

All applicants must complete this form for their proposals. <u>Failure to answer these questions</u> will result in the application not being considered for funding.

1. Proposal Title:

Arundo Eradication and Coordination-Phase II

2. Proposal Applicants:

Sonoma Ecology Center for Team Arundo del Norte

3. Corresponding Contact Person:

Mark Newhouser Sonoma Ecology Center 205 First St. W. Sonoma Ca 95476 707 996-0712 ext.103

4. Project Keywords:

Non-Native Invasive Species Riparian Ecology Watershed Management

5. Type of project:

Implementation_Full

6. Does the project involve land acquisition, either in fee or through a conservation easement?

No

7. Topic Area:

Non-Native Invasive Species

8. Type of applicant:

Private non-profit

9. Location – GIS coordinates

Cache Creek Latitude: 39? 9' N Longitude: 123? 12' W

Graylodge Wildlife Area Latitude: 39? 20' N Longitude: 121? 50' W

Lindo Channel Latitude: 39? 48' N Longitude: 121? 51' W

Napa River Latitude: 38?13'N Longitude: 122? 17'W

Putah Creek Latitude: 38? 38'N Longitude: 121? 56'W

Lower American River Latitude: 38? 31'N Longitude: 121? 31'W

San Francisquito Creek Latitude: 37? 22'N Longitude: 121? 56'W

San Joaquin River Latitude: 36?46'N Longitude: 119?43'W

Sonoma Creek Latitude: 38?30'N Longitude: 122? 48'W

Walnut Creek Latitude: 37? 58'N Longitude: 121?59'N Describe project location using information such as water bodies, river miles, road intersections, landmarks, and size in acres.

Walnut Creek, Sonoma Creek, Napa River, San Francisquito Creek, Putah Creek, Cache Creek, Lindo Channel, San Joaquin River, Lower American River, and Gray Lodge Wildlife Area. (see attachment C) Approximately 273 acres of Arundo donax on over 63 miles of rivers and creeks is identified for eradication under this proposal.

10. Location – Ecozone

7.7 Butte Sink, Butte Basin-Chico, 9.2 Lower American River, 10.1 Cache Creek, 10.2 Putah Creek, 12.4 Gravelly Ford to Friant Dam, West San Joaquin Basin, 2.1 Suisun Bay & Marsh, 2.2 Napa River, 2.3 Sonoma Creek, 7.7 Lindo Channel, Code 15: Landscape

11. Location – County

Butte, Contra Costa, Fresno, Lake, Madera, Merced, Napa, Sacramento, San Mateo, Santa Clara, Solano, Sonoma, Yolo

12. Location - City. Does your project fall within a city jurisdiction?

Yes

13. If yes, please list the city:

Walnut Creek, Calistoga, Palo Alto, Fresno, Dos Pabs, Los Banos, Clear Lake, Lakeport, Chico

14. Location – Tribal Lands. Does your project fall on or adjacent to tribal lands?

Yes

Big Valley Rancheria, Blue Lake Rancheria, Elem Pomo Tribe, Habematolel Pomo Upper Lake, Middletown Rancheria, Robinson Rancheria Band of Pomo Indians, Scotts Valley

15. Location – Congressional District.

1, 2, 3, 5, 6, 18, 19, 21 and more to be determined.

16. Location – California State Senate District & California Assembly District

California State Senate District Number: 2, 4, 5, 6, 12, 14, 16, 32 and more to be determined. California Assembly District Number: 1, 3, 5, 7, 9, 10, 14, 25, 29, 30 and more to be determined.

17. How many years of funding are you requesting?

3 but need 5 for adequate monitoring.

18. Requested Funds:

a. Are your overhead rates different depending on whether funds are state or federal?

No

b. If yes, list the different overhead rates and total requested funds.

c. If no, list single overhead rate and total requested funds.
Single Overhead Rate: 15.5%
Total Requested Funds: \$1,840,791

d. Do you have cost share partners already identified?

Yes

If yes, list partners and amount contributed by each.

Current Partners (5)	\$ 54,284
American River/CNPS grants \$100K + Volunteer labor \$180K	\$140,575
Cache Creek/NRCS \$900, Lake County CRMP \$10,410, WMA SB 1740 \$59,779, F.C. zone 1& 8 \$5,901	\$76,990
San Joaquin River/S.J. Conservation Trust	\$35,000
Gray Lodge Wildlife Area/CDFG \$2420, Jones Flying Service \$5200	\$29,220
Lindo Channel/ City of Chico	\$66,200
Information Center for the Environment/CERES	\$10,000
USDA, ARS Exotic and Invasive Weed Research Unit	\$58,800
e. Do you have potential cost share partners?	

Yes

If yes, list partners and amount contributed by each.

All the above confirmed for a total of:	\$566,069
CERES	\$10,000
Sonoma State University/ Geographic Information Center	\$10,000
San Joaquin River Riparian Habitat Restoration Program	\$75,000

f. Are you specifically seeking non-federal cost share funds through this solicitation?

No

If yes, list total non-federal funds requested.

g. If the total non-federal cost share funds requested above does not match the total state funds requested in 19a, please explain the difference.

19. Is this proposal for next-phase funding of an ongoing project funded by CALFED?

Yes

If yes, identify project number(s), title(s) and CALFED program.

113320J033 Arundo donax Eradication and Coordination ERP

20. Have you previously received funding from CALFED for other projects not listed above?

No

If yes, identify project number(s), title, and CALFED program.

21. Is this proposal for next-phase funding of an ongoing project funded by CVPIA?

No

If yes, identify project number(s), title, and CVPIA program.

22. Have you previously received funding from CVPIA for other projects not listed above?

No

23. Is this proposal for next-phase of an ongoing project funded by an entity other than CALFED or CVPIA?

No

If yes, identify project number(s), title, and funding source.

24. Please list suggested reviewers for your proposal. (optional)

Name	<u>Organization</u>	Phone	Email
Steve Schoenig	CDFA	916-654-0768	sschoenig@cdfa.ca.org
Jan Lowrey	Cache Creek Conservancy	530-661-1070	cachecrk@yolo.net
Tom Dudley	University of Nevada, Reno	775-784-1716	tdudley@cabnr.unr.edu
Joel Trumbo	Ca.Dept. of Fish & Game, Pesticide Investigation Unit	916-358-2952	jtrumbo@ospr.dfg.ca.gov
Karen Gaffney	Circuit Riders Productions	707-838-6641, ext.216	kgaffney@crpinc.org

25. Comments.

This is the second phase of a fully funded NIS eradication project that covers a broad geographic area. The total area, including the planned expansion, includes 10 watersheds in 12 counties.

Ecosystem Restoration Program - 2002 Proposal Solicitation Package Form II – Executive Summary

Arundo donax Eradication and Coordination: Phase II—Resubmittal April 2004 A Program of Team Arundo del Norte

This proposal represents the planned expansion (Phase 2) of the CBDA-funded *Arundo donax* Eradication and Coordination Program. This program is sponsored by Team Arundo del Norte (TAdN), a network of local, state, and federal organizations dedicated to the eradication of *Arundo donax* (Arundo, giant cane), a non-native invasive species that threatens riparian and aquatic habitat through native plant displacement, stream channel degradation, increased flood and fire risk, and increased water use. The applicant is the Sonoma Ecology Center, a founding member of TAdN. Key partners include the Information Center for the Environment (UC Davis), CERES, USDA Agricultural Research Service, University of Nevada Reno, EDAW, California Department of Fish & Game, Sonoma State University, and several eradication efforts throughout the CBDA region.

There are a number of projects in California that have successfully eradicated Arundo since the mid-1990s, demonstrating the high level of existing knowledge about eradication techniques. Hundreds of acres have been cleared of Arundo with success rates above 80%, particularly in southern California where the infestations are larger and the threat was first recognized. Arundo infestations in the CBDA region are still at the scale where prompt, coordinated, strategic action could prevent the large invasions (over 10,000 acres) that have devastated several southern California streams. Team Arundo del Norte was formed to address that threat.

The program takes a coordinated regional approach that centralizes many aspects of NIS control and promotes partnerships among local organizations and agencies. It oversees the methods and progress of partners' effort, reducing the need for CBDA to administer numerous individual projects. This approach is cost-effective and prevents redundant work. Standardized data collected as partners treat and monitor Arundo infestations is allowing the construction of a single body of information for analysis across efforts.

Although much is known about how to eradicate the plant and the benefits of its removal, there is still a need to refine techniques, document long-term riparian and fluvial recovery after eradication, map Arundo's distribution to better prioritize eradication efforts, and apply this information in an adaptive manner to the ongoing management of Arundo. Building on the established body of knowledge that documents successful eradication techniques, this is a full-scale implementation project, using a coordinated program to control Arundo in the CBDA region, eliminate further invasion impacts, restore riparian and fluvial functions at eradication sites, and improve the state of knowledge about Arundo control. What is learned applies to most other riparian weed problems in the CBDA region.

The program selects high-priority sites for Arundo eradication and subsequent restoration, guides eradication partners to create an approved Eradication Plan, provides guidance and funding for plannning, pre-eradication surveys, permitting, getting access to property, eradication, and post-treatment monitoring and retreatment. The program provides extensive guidance and monitoring

protocols, but not funding, for post-treatment revegetation efforts that occur at most eradication sites.

In Phase I of the program, 5 partners initiated Arundo eradication projects in their watersheds. They prepared eradication plans, conducted site surveys, obtained permits and landowner access, and began eradication work—all with the support of the program. The program developed an Arundo survey and monitoring protocol, and trained partners in its use. It developed an online library, listserv, and other reference information, and disseminated Arundo educational materials to program partners, agencies, and other stakeholders throughout the western states.

Eradication partners conducting on-the-ground work will collect data to allow evaluation of cumulative Arundo eradication and riparian restoration success. In addition, a professional weed scientist and weed ecologist will test the following hypotheses at eradication sites. They are:

Hypothesis 1a	Herbicide formulation and dosage affect Arundo treatment efficacy.
Hypothesis 1b	The timing of Arundo treatment affects treatment efficacy.
Hypothesis 1c	The distance of the treatment site from the stream affects treatment efficacy
Hypothesis 2	Active revegetation is required to achieve long-term recovery of native
	riparian vegetation at weed eradication sites.
Hypothesis 3	Stream channel capacity increases at Arundo removal sites.

In Phase II, the program will initiate eradication projects in 5 additional watersheds (for a total of 10 projects in 12 counties), expand current eradication areas, extend the time for adequate monitoring, improve the program's experimental design and monitoring activities, and use GIS and field mapping to better prioritize eradication efforts. The new sites are on Cache Creek, the San Joaquin River, Lindo Channel, the American River, and the Gray Lodge State Wildlife Area. Current partners will continue work on Sonoma Creek, Walnut Creek, Napa River, Putah Creek, and San Francisquito Creek. The program will continue to provide advice, quality assurance, and coordination to emerging eradication efforts.

The cost for three years of Phase 2 funding is \$1,840,791. The amount of cost-share is \$566,069.

Ecosystem Restoration Program - 2002 Proposal Solicitation Package (PSP): Form III - Environmental Compliance Checklist

All applicants must complete this form for their proposals. <u>Failure to answer these questions will</u> result in the application not being considered for funding.

Successful applicants are responsible for complying with all applicable laws and regulations for their projects, including the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

Any necessary NEPA or CEQA documents for an approved project must tier from the CALFED <u>Programmatic Record of Decision</u> and Programmatic EIS/EIR to avoid or minimize the projects adverse environmental impacts. Applicants are encouraged to review the <u>Programmatic EIS/EIR</u> and incorporate the applicable mitigation strategies from Appendix A of the Programmatic Record of Decision in developing their projects and the NEPA/CEQA documents for their projects.

1. **CEQA or NEPA Compliance**

a. Will this project require compliance with CEQA?

Yes

b. Will this project require compliance with NEPA?

Yes

If neither CEQA or NEPA compliance is required, please explain why compliance is not required for the actions in this proposal.

2. If the project will require CEQA and/or NEPA compliance, identify the lead agency(ies). Please write out all words in the agency title other than United States (use the abbreviation US) or California (use the abbreviation CA). If not applicable, put None.

CEQA Lead Agency: CA Department of Fish and Game **NEPA Lead Agency (or co-lead:)** US Fish and Wildlife Service **NEPA Co-Lead Agency (if applicable):**

3. Please check which type of CEQA/NEPA documentation is anticipated.

CEQA

XXX Categorical Exemption

Negative Declaration or Mitigated Negative Declaration

EIR

 NEPA

 XXX
 Categorical Exclusion

 XXX
 Environmental Assessment/FONSI

 EIS
 EIS

If you anticipate relying on either the Categorical Exemption or Categorical Exclusion for this project, please specifically identify the exemption and/or exclusion that you believe covers this project.

Categorical Exemption (Class 1:15301; Class 4: 15304)

NIS vegetation removal, stream flow maintenance

CEQA/NEPA Process

a. Is the CEQA/NEPA process complete?

No

b. If the CEQA/NEPA process is not complete, please describe the dates for completing draft and/or final CEQA/NEPA documents.

6 months following contract acquisition.

c. If the CEQA/NEPA document has been completed, please list document name(s):

4. Environmental Permitting and Approvals

Successful applicants must tier their project's permitting from the CALFED Record of Decision and attachments providing programmatic guidance on complying with the state and federal endangered species acts, the Coastal Zone Management Act, and sections 404 and 401 of the Clean Water Act. The CALFED Program will provide assistance with project permitting through its newly established permit clearing house.

Please indicate what permits or other approvals may be required for the activities contained in your proposal and also which have already been obtained. Please check all that apply. If a permit is *not* required, leave both Required? and Obtained? check boxes blank.

LOCAL PERMITS AND APPROVALS

Conditional use permit
Variance
Subdivision Map Act
Grading Permit
General Plan Amendment
Specific Plan Approval
Rezone
Williamson Act Contract Cancellation
Other

STATE PERMITS AND APPROVALS

Scientific Collecting Permit	
CESA Compliance: 2081	
CESA Compliance: NCCP	
1601/03	Required
CWA 401 certification	Required, for certain conditions and methods
Coastal Development Permit	
Reclamation Board Approval	Possible
Notification of DPC or BCDC	
Other	
FEDERAL PERMITS AND APPROVAL	<u></u>
ESA Compliance Section 7 Consultation	
ESA Compliance Section 10 Permit	
Rivers and Harbors Act	
CWA 404	Required, for certain conditions and methods
Other	

PERMISSION TO ACCESS PROPERTY

Permission to access city, county or other local agency land. Agency Name: City of Chico, City of Sacramento, City of Napa, City of San Mateo, Lake County Flood Control and Water Conservation District, American River Flood Control District, Napa County Flood Control District, Contra Costa County Flood Control District, Butte County Agriculture Commission, Sacramento County Parks Department, Solano County Water Agency, Sonoma County Water Agency, San Joaquin River Parkway Trust Inc.

Permission to access state land. Agency Name: CA Department of Fish and Game

Permission to access federal land. Agency Name: Bureau of Reclamation

Permission to access private land. Landowner Name:

Comments. If you have comments on any of the above questions, please enter the question number followed by a specific comment.

#4. Many of the new partners in this project have standing jurisdiction in waterways and existing maintenance and weed management programs. With the exception of a few private property owners, most eradication work will be done on lands owned or controlled by project partners.

Ecosystem Restoration Program - 2002 Proposal Solicitation Package (PSP): Form IV - Land Use Checklist

All applicants must complete this form for their proposals. Failure to answer these questions will result in the application not being considered for funding.

1. Does the project involve land acquisition, either in fee or through a conservation easement?

No

2. If you answered yes to #1, please answer the following questions:

- a. How many acres will be acquired?
- b. Will existing water rights be acquired?
- c. Are any changes to water rights or delivery of water proposed?
- d. If yes, please describe proposed changes.
- e. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?

Yes

3. Do the actions in the proposal involve physical changes in the land use?

No

4. If you answered no to #3, explain what type of actions are involved in the proposal (i.e., research only, planning only).

Non-native plant eradication and native plant revegetation only

5. If you answered yes to #3, please answer the following questions:

a. How many acres of land will be subject to a land use change under the proposal?

b. Describe what changes will occur on the land involved in the proposal.

c. List current and proposed land use, zoning and general plan designations of the area subject to a land use change under the proposal.

d. Is the land currently under a Williamson Act contract? (For multiple sites, answer Yes if true for any parcel, and provide an explanation in the Comments box below)

e. Is the land mapped as Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Farmland of Local Importance under the California Department of Conservation's Farmland Mapping and Monitoring Program? For more information, contact the California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program (http://www.consrv.ca.gov/dlrp/FMMP/index.htm). (For multiple sites, answer Yes if true for any parcel, and provide an explanation in the Comments box below)

f. If yes, please list classification:

g. Describe what entity or organization will manage the property and provide operations and maintenance services.

6. Comments.

Most access is through lands owned or in the jurisdiction of the listed managers and partners.

Ecosystem Restoration Program - 2002 Proposal Solicitation Package (PSP): Form V - Conflict of Interest Checklist

All applicants must complete this form for their proposals. <u>Failure to answer these</u> questions will result in the application not being considered for funding.

You may update your information at any time. The [update proposal] button is located at the bottom of this form.

Please list below the full names and organizations of all individuals in the following categories:

- ?? Applicants listed in the proposal who wrote the proposal, will be performing the tasks listed in the proposal or who will benefit financially if the proposal is funded.
- ?? Subcontractors listed in the proposal who will perform some tasks listed in the proposal and will benefit financially if the proposal is funded.
- ?? Individuals not listed in the proposal who helped with proposal development, for example by reviewing drafts, or by providing critical suggestions or ideas contained within the proposal.

The information provided on this form will be used to select appropriate and unbiased reviewers for your proposal.

Applicant(s):

Sonoma Ecology Center for Team Arundo del Norte

Subcontractor(s):

Are specific subcontractors identified in this proposal?

Yes

If yes, please list the name(s) and organization(s):

Tom Dudley, University of Nevada, Reno

Deanne Dipietro, Technical Consultant

Karen Willet, Information Center for the Environment (ICE)

Ron Unger, EDAW

David Spencer, USDA ARS Exotic and Invasive Weed Research Unit

Helped with proposal development

Are there persons who helped with proposal development?

Yes

If yes, please list the name(s) and organization(s):

Richard Dale, Sonoma Ecology Center

Caitlin Cornwall, Sonoma Ecology Center

Mark Newhouser, Sonoma Ecology Center

Bob Hass, Sonoma Ecology Center

Tracy Enhelder, Sonoma Ecology Center

Deanne DiPietro, Sonoma State University

Ron Unger, EDAW

Davis Spencer, USDA ARS

Tom Dudley, University of Nevada, Reno

Comments:

				Y	EAR ON	Ξ					
	Direct							Other	Total		
	Labor				Supplie			Direct	Direct	Indirect	Total
ask	Hours	Salary	Benefits	Travel	S	Services	Equip't	Costs	Costs	Costs	Cost
Eradication and Monitoring											
1 Napa River						11,300					
2 San Francisquito Creek						9,671					
3 Sonoma Creek						15,715					
4 Putah Creek						32,842					
5 Walnut Creek						10,302					
6 American River						26,234					
7 Cache Creek						75,229					
8 Gray Lodge Wildlife Area						10,633					
9 San Joaquin River						22,500					
10 Lindo Channel						<u>55,543</u>					
			Erad	lication	Subtotal	269,968	0	0	269,968	0	269,968
11 Project Coordination	2,080	60,000	13,200	2,225	6,440	0	0	1,400	83,265	9,300	92,565
12 Data Coordination	2,080	55,000	12,100	1,001	1,170	35,007	0	900	105,178	8,525	113,703
13 Mapping	1,560	33,000	7,260	3,600	14,920	0	0	1,900	60,680	5,115	65,795
14 Experim'l Design & Mor	80	2,115	465	1,080	0	86,352	0	0	90,013	328	90,341
15 Programmatic Permittin	100	2,644	582	108	0	116,450	0	0	119,784	410	120,194
16 Equipment & Training	48	1,269	279	324	0	7,500	50,000	0	59,372	197	59,569
YEAR ONE TOTAL	5,948	154,029	33,886	8,338	22,530	515,277	50,000	4,200	788,260	23,874	812,134

Ecosystem Restoration Program - 2002 Proposal Solicitation Package (PSP) Form VI - Project Information

Note: indirect costs are independent of funding source.

				Y	EAR TW	0					
	Direct							Other	Total		
	Labor				Supplie			Direct	Direct	Indirect	Total
ask	Hours	Salary	Benefits	Travel	S	Services	Equip't	Costs	Costs	Costs	Cost
Eradication and Monitoring											
1 Napa River						11,300					
2 San Francisquito Creek						9,671					
3 Sonoma Creek						15,715					
4 Putah Creek						32,842					
5 Walnut Creek						10,302					
6 American River						5,550					
7 Cache Creek						29,444					
8 Gray Lodge Wildlife Area						8,331					
9 San Joaquin River						40,000					
10 Lindo Channel						<u>55,543</u>					
			Erad	lication	Subtotal	218,697	0	0	218,697	0	218,697
11 Project Coordination	2,080	60,000	13,200	2,261	1,040	0	0	1,400	77,901	9,300	87,201
12 Data Coordination	2,080	55,000	12,100	1,001	3,770	0	0	900	72,771	8,525	81,296
13 Mapping	1,560	33,000	7,260	5,400	1,920	0	0	1,900	49,480	5,115	54,595
14 Experim'l Design & Mor	80	2,115	465	648	0	86,352	0	0	89,581	328	89,909
15 Programmatic Permittin	100	2,644	582	108	0	20,550	0	0	23,884	410	24,294
16 Equipment & Training	48	1,269	279	108	0	0	0	0	1,656	197	1,853
YEAR TWO TOTAL	5,948	154,029	33,886	9,526	6,730	325,599	0	4,200	533,970	23,874	557,844

				YE	AR THR	ΞE					
	Direct							Other	Total		
	Labor				Supplie			Direct	Direct	Indirect	Total
ask	Hours	Salary	Benefits	Travel	S	Services	Equip't	Costs	Costs	Costs	Cost
Eradication & Monitoring											
6 American River						22,483					
7 Cache Creek						30,662					
8 Gray Lodge Wildlife Area						6,909					
9 San Joaquin River						45,000					
10 Lindo Channel						<u>55,542</u>					
			Erad	lication	Subtotal	160,596	0	0	160,596	0	160,596
11 Project Coordination	2,080	60,000	13,200	2,261	1,040	0	0	1,400	77,901	9,300	87,201
12 Data Coordination	2,080	55,000	12,100	1,001	1,170	0	0	900	70,171	8,525	78,696
13 Mapping	1,560	33,000	7,260	1,800	1,920	0	0	1,900	45,880	5,115	50,995
14 Experim'l Design & Mor	80	2,115	465	648	0	86,352	0	0	89,581	328	89,909
15 Programmatic Permittin	40	1,058	233	108	0	0	0	0	1,398	164	1,562
16 Equipment & Training	48	1,269	279	108	0	0	0	0	1,656	197	1,853
YEAR THREE TOTAL	5,888	152,442	33,537	5,926	4,130	246,948	0	4,200	447,183	23,629	470,812

 THREE-YEAR TOTALS
 17,784
 460,500
 101,310
 23,789
 33,390
 1,087,824
 50,000
 12,600
 1,769,413
 71,378
 1,840,791

Ecosystem Restoration Program - 2002 Proposal Solicitation Package (PSP): Form VII - Budget Justification

All applicants must complete this form for their proposals. <u>Failure to answer these questions will</u> result in the application not being considered for funding.

Direct Labor Hours. Provide estimated hours proposed for each individual.

Project Manager/Task 11– (2,080 hours per year, 3 years) 6,240 hours; Data Coordinator/Task 12– (2,080 hours per year, 3 years) 6,240 hours; Geographic Technic ian/Task 13– (1,560 hours per year, 3 years) 4,680 hours; Supervisor/Tasks 14, 15, 16– (228 hours/year, years 1 and 2; 168 hours year 3) 624 hours

Salary. Provide estimated rate of compensation proposed for each individual.

Project Manager/Task 11– \$28.85/hr; Data Coordinator/Task 12– \$26.44/hr; Geographic Technician/Task 13– \$21.15/hr; Supervisor/Tasks 14,15,16– \$26.44

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

Project Manager, Data Coordinator, Geographic Technician, Task Supervisor– Benefits calculated at 22%

Travel. Provide purpose and estimate costs for all non-local travel.

All mileage calculated at \$0.36/mile

PrgMgr/ Task 11/Yr1: 30 partner site visits ~ 150 miles; 4 conferences ~ 200 miles; 4 partner quarterly meetings ~ 140 miles; 2 agency/CBDA meetings ~ 160 miles: \$2,225

PrgMgr/ Task 11/Yr2: 20 partner site visits ~ 150 miles; 4 conferences ~ 200 miles; 8 potential partner visits ~ 200 miles; 4 partner quarterly meetings ~ 140 miles; 2 agency/CBDA meetings ~ 160 miles: \$2,261

PrgMgr/ Task 11/Yr3: 20 partner site visits ~ 150 miles; 4 conferences ~ 200 miles; 8 potential partner visits ~ 200 miles; 4 partner quarterly meetings ~ 140 miles; 2 agency/CBDA meetings ~ 160 miles: \$2,261

DataCoord/ Task 12/Yr1: 10 partner site visits ~150 miles; 2 conferences ~ 200 miles; 4 partner quarterly meetings ~ 140 miles; 2 agency/CBDA meetings ~ 160 miles: \$1,001

DataCoord/ Task 12/Yr2: 10 partner site visits ~150 miles; 2 conferences ~ 200 miles; 4 partner quarterly meetings ~ 140 miles; 2 agency/CBDA meetings ~ 160 miles: \$1,001

DataCoord/ Task 12/Yr3: 10 partner site visits ~150 miles; 2 conferences ~ 200 miles; 4 partner quarterly meetings ~ 140 miles; 2 agency/CBDA meetings ~ 160 miles: \$1,001

GeographicTech/ Task 13/Yr1: 10,000 miles field data collection and ground truth: \$3,600

GeographicTech / Task 13/Yr2: 15,000 miles field data collection and ground truth: \$5,400

GeographicTech / Task 13/Yr3: 5,000 miles field data collection and ground truth: \$1,800

Supervisor/Tasks 14,15,16/ Yr1: 28 site visits ~ 150 miles; \$1,512

Supervisor/Tasks 14,15,16/ Yr2: 16 site visits ~ 150 miles; \$864

Supervisor/Tasks 14,15,16/ Yr3: 16 site visits ~ 150 miles; \$864

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

PrgMgr/Task 11/Yr1: (computing) portable computer and service contract \$2,600; software: \$500; video projector: \$2,400; (field) cell phone plan 45/mo: \$540; (office) supplies: \$400 Total: \$6,440

PrgMgr/Task 11/Yr2: (field) cell phone plan 45/mo: \$540; (office) supplies: \$500 Total: \$1,040

PrgMgr/Task 11/Yr3: (field) cell phone plan 45/mo: \$540; (office) supplies: \$500 Total: \$1,040

DataCoord/ Task 12/Yr1: (computing) software \$500; (field) cell phone plan 35/mo \$420; (office) supplies: \$250 Total: \$1170

DataCoord/ Task 12/Yr2: (computing) portable computer and service contract \$2,600; software: \$500; (field) cell phone plan 35/mo: \$420; (office) supplies: \$250 Total: \$3,770

DataCoord/ Task 12/Yr3: (computing) software \$500; (field) cell phone plan 35/mo \$420; (office) supplies: \$250 Total: \$1,170

Geogr Tech/ Task 13/Yr1: (computing) data acquisition \$5,000; ArcMap license \$1,000; portable computer and service contract \$2500; (field) camera: \$500; cell phone use 35/mo \$420; Geoexplorer III unit or equiv. GPS unit \$5,000; (office) supplies \$500 Total: \$14,920

Geogr Tech/ Task 13/Yr2: (computing) ArcMap license \$1000; (field) cell phone use 35/mo \$420; (office) supplies \$500 Total: \$1,920

Geogr Tech/ Task 13/Yr3: (computing) ArcMap license \$1000; (field) cell phone use 35/mo \$420; (office) supplies \$500 Total: \$1,920

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

Subcontractors (eradication partners, research team, and programmatic permit lead) have submitted very detailed budgets and budget justifications, shown in attachment E, except for the following:

Task 12, Information Center for the Environment (ICE), \$35,007. This fee will be used to finalize database development and to add editing querying functionality to this statewide database. Labor positions, hours, and rates include: Database designer, 750 hours, 26.62/hr, \$19,965; Web Specialist, 275 hours, 36.62/hr, \$10,071; Project manager, 125 hours, 39.77 hours, \$4,971. Total: \$35,007.

Task 14, Research analyst will provide oversight of research, analysis, and final report, 480 hours over three year period, \$100/hr, Total: \$48,000.

Task 16, Manufacturer maintenance contract, 15% of purchase price \$50,000, Total: \$7,500

Current partners will conduct monitoring tasks, as follows:

Task 1, Napa River, Vegetation Manager, \$35/hr, 440 hours over 2 years, \$15,400, CCC crew, \$1200/day for 6 days, \$7,200, Total: \$22,600.

Task 2, San Francisquito Creek, Vegetation Manager, \$30.25/hr, 415 hours over 2 years, \$12,553.75. Travel, 400 miles, \$0.36/mi, \$144/yr over 2 years, \$288, CCC crew, \$1200/day for 5 days, \$6,000, Supplies, \$250/yr. over 2 years, \$500. Total: \$19,341.5

Task 3, Sonoma Creek, Vegetation Manager, \$23.10/hr, 900 hours over 2 years, \$20,790. Travel, 750 miles, \$0.36/mi, \$270/yr for 2 years, \$540, CCC crew, \$1200/day for 8 days, \$9,600, Supplies, \$250/yr for 2 years, \$500.Total: \$31,430.

Task 4, Putah Creek, Streamkeeper, \$34.57/hr, 1,900 hours over 2 years, Total: \$65,683.

Task 5, Walnut Creek, Student Monitor, \$25.95/hr, 710 hours over 2 years, \$18,424.50. Senior Vegetation Manager/Specialist, \$108.97/hour, 20 hours over 2 years, \$2,179.40.Total: \$20,603.90.

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

Task 16/Year 1, purchase of 2 flail mower attachment units to mount to existing partner tractor equipment. Two units at \$25,000. Total: \$50,000.

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentations, response to project specific questions and necessary costs directly associated with specific project oversight.

Project management tasks will be accomplished by program staff, largely by Project Manager. These activities are described in detail in the proposal text. Costs for these tasks are included in task line items, not in a separate program management line.

Other Direct Costs. Provide any other direct costs not already covered.

ProjMgr/Task 11/Yrs1-3: conferences: \$1,400/year: Total: \$4,200

DataCoord/Task12/Yrs1-3 conferences: \$900/year: Total: \$2,700

Geographic Technician/Task 13/Yrs 1-3 conferences \$1,900/year: Total: \$5,700

Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs. *[CORRECTION: If overhead costs are different for State and Federal funds, note the different overhead rates and corresponding total requested funds on Form I - Project Information, Question 17a. On Form VI - Budget Summary, fill out one detailed budget for each year of requested funds, indicating on the form whether you are presenting the indirect costs based on the Federal overhead rate or State overhead rate. Our assumption is that line items other than indirect costs will remain the same whether funds come from State or Federal sources. If this assumption is not true for your budget, provide an explanation on the Budget Justification form.]* Agencies should include any internal costs associated with the management of project funds.

Indirect costs (\$71,379) include the following: Accounting/clerical: \$6,300/yr; Management: \$6,000/yr; Rent, utilities, insurance, phones, copies: \$6,093/yr; Computer services: \$5,400/yr Total \$23,793/yr; \$71,379/project period

Ecosystem Restoration Program - 2002 Proposal Solicitation Package (PSP): Signature Page

Each applicant submitting a proposal to the CALFED Bay-Delta Program Ecosystem Restoration Program must submit a signed Signature Page.

Failure to sign and submit this form will result in the application not being considered for funding.

The individual signing below declares the following:

- the truthfulness of all representations in this proposal;
- the individual signing the form is authorized to submit the application on behalf of the applicant (if applicant is an entity or organization; and
- the applicant has read and understood the conflict of interest and confidentiality discussion in the PSP Section 2.4 and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in this PSP.

Proposal Title:

Authorized Signature

RICHARD DALE, E.D.

Printed Name

SOMOMA ECOLOGY CENTER

Organization

Arundo donax Eradication and Coordination Program, Phase 2—April 2004 A Project of Team Arundo del Norte

CALFED Proposal, October 2001 (Revised for CBDA as a Directed Action in December 2003 and April 2004)

A. PROJECT DESCRIPTION: PROJECT GOALS AND SCOPE OF WORK

A1. PROBLEM, GOALS, OBJECTIVES, AND HYPOTHESES

Problem

The non-native invasive grass *Arundo donax* (Arundo, giant cane) threatens the ecological integrity of the rivers and streams throughout the California Bay Delta Authority (CBDA) region by altering ecosystem processes and negatively affecting native species (Fig. 1). Arundo's effects on native systems and its modes of reproduction are well documented (Douce, 1993; Iverson, 1993; Dudley and Collins, 1995; Frandsen, 1993; Else, 1996; Bell, 1997; Trumbo, 1998; Boose and Holt, 1999; Gaffney, 2002).



Arundo does not produce viable seed in this region, therefore it generally only spreads downstream vegetatively. It was widely planted throughout California for erosion control and screening. However, its spread is now controllable, because educational and policy efforts have limited intentional introductions, and techniques for its removal are now well-established.

There are a number of projects in California that have successfully eradicated Arundo, demonstrating the high level of existing knowledge about eradication techniques. Riverside County Parks has sponsored an Arundo program since 1996. To date, 334 acres of Arundo have been removed, with regrowth controlled by periodic monitoring (Baxter, 2004). Over 500 acres of Arundo have been removed from 1995–2004 in the Santa Margarita Watershed, and 110 acres in the San Luis Rey Watershed, with 90–100% success after 5 years (Giessow, 2004). In Cache Creek, nearly 900 acres of mixed Arundo and *Tamarix* have been eradicated, with 80–90%

success after 3 years (Lowrey, 2004). More can be learned to refine precisely what eradication treatment timing, herbicide dosage and formulation, and revegetation practices are most appropriate across geographic and site differences (Fig. 2).

Arundo has the following effects on CBDA streams. 1. Arundo alters stream flow and geomorphology. By establishing large stands on streambanks and in active stream channels, Arundo can reduce the hydrologic capacity of a waterway and increase flooding. It grows readily on gravel bars and in the streambed, changing flow regimes and directing erosive flows to opposite banks. The flows undercut and destabilize stream banks, causing tree loss, property damage, and sedimentation downstream which degrades spawning habitat. 2. The shallow, rhizomatous roots of Arundo break off in large mats that wash away, forming dams, blocking culverts and bridges, and causing flooding downstream. 3. Arundo displaces native canopy vegetation, allowing greater solar exposure of surface water, resulting in damaging temperatures for salmonids. 4. Aquatic species lose spawning and rearing habitat, and avian and terrestrial species lose nesting and foraging habitat. Due to these multiple effects, an Arundo-infested riparian area can no longer support its original diversity of native wildlife species. 5. Arundo ultimately destroys riparian vegetation through fire. Fire-adapted Arundo burns even when green and its tall canes carry the fire into the canopy of riparian trees. The fire generally destroys the native trees, while the Arundo resprouts from fire-resistant rhizomes. With its competition gone, Arundo emerges as a monoculture.

Arundo has established itself as a climax species in several river ecosystems, including the Santa Ana River and the Santa Margarita River in Southern California. This plant is currently demonstrating its ability to take over riparian habitat in several Northern California waterways, as exemplified by its increasing acreage in the Sacramento and San Joaquin river systems as well as in many smaller streams in the CBDA region (Dudley and Collins, 1995). *Arundo donax* is widely recognized as highly invasive and damaging. Arundo is listed by the USDA as a noxious weed and rated as A-1 (Most Invasive Wildland Pest Plant) by the California Invasive Plant Council (Cal-IPC). Cal-IPC's A-1 designation is reserved for aggressive invaders that displace natives and disrupt natural habitats in more than three *Jepson Manual* geographic subdivisions. Arundo has been nominated as among 100 of the "World's Worst" invaders in the Global Invasive Species Database (www.issg.org).

There has been interest in understanding what factors predispose a site to invasion by Arundo, with the assumption that if these factors were understood, invasion could be prevented. However, experience shows that the best ways to prevent new invasions of Arundo are to eradicate propagule sources (i.e., upstream infestations) and to use education and policy to prevent intentional introductions. It makes sense to focus limited resources on these successful methods.

A rigorous evaluation of riparian restoration methods is very important, but is beyond the scope of this proposal. Instead, we propose to monitor the success of restoration efforts following eradication—especially reinvasion by weeds—for five years (three funded by this grant). This data will constitute a good basis that can be used by others to develop a more rigorous, controlled examination of factors affecting restoration success. The monitoring program is described below in Approach.

Goals

• Eradicate Arundo and restore riparian and aquatic habitat at sites where restoration will contribute to recovery of sensitive species, habitats, and ecosystem processes of concern

to CBDA, and protect property and working landscapes.

• Use information gained through monitoring and experimentation to continually refine methodologies for increased eradication efficacy, reduced costs, reduced herbicide load to the environment, and better restoration of ecological functions at eradication sites.

Objectives

Adaptive Management

- Collect data from new and current Arundo eradication sites on infestation characteristics, pre-eradication surveys, Arundo treatment, post-treatment monitoring, post-treatment restoration efforts, and overall eradication and restoration success. From these data, refine hypotheses on effectiveness of eradication and restoration techniques.
- Use controlled experiments to test several hypotheses related to refinements of eradication techniques.
- Disseminate guidance on weed eradication and riparian revegetation to current and future eradication partners based on the latest state of knowledge.
- Obtain programmatic environmental compliance for activities related to Arundo eradication to reduce costs, redundancies, and delays.

Coordinated Eradication and Restoration

- Act as an agent for CBDA by funding qualified, high-priority Arundo eradication projects.
- Provide standards, guidance, and quality assurance for Arundo eradication, monitoring, and restoration of eradication sites in the CBDA region.
- Identify and foster potential new eradication partners in priority areas.
- Provide specialized training and mowing/mulching equipment to 2 regional operators.

Mapping and Prioritizing

- Create a map of Arundo infestations in the CBDA region.
- Establish eradication priorities based on Arundo's threat to sensitive species, restorable habitats, working landscapes, and local capacity (see details on criteria, in Approach).
- Develop a regional eradication strategy that effectively directs resources to priority projects.

Hypotheses

Fig. 2 diagrams how the program's hypotheses, listed below, arise from uncertainties about eradication and restoration techniques.

Hypothesis 1a	Herbicide formulation and dosage affect Arundo treatment efficacy.
Hypothesis 1b	The timing of Arundo treatment affects treatment efficacy.
Hypothesis 1c	The distance of the treatment site from the stream affects treatment efficacy.
Hypothesis 2	Active revegetation is required to achieve long-term recovery of native
	riparian vegetation at weed eradication sites.
Hypothesis 3	Stream channel capacity increases at Arundo removal sites.



A2. JUSTIFICATION

Conceptual Model

State of Knowledge to Date

This program is based on the following assumptions, diagrammed in Figs. 1 and 2:

- 1. Arundo invasion severely degrades riparian and aquatic habitats (Douce, 1993; Douthit, 1993; Bell, 1997; Else, 1996).
- 2. Arundo does not produce viable seed in California. It reproduces and spreads downstream vegetatively (Bell, 1997).
- 3. Arundo stands impede flood waters (Frandsen and Jackson, 1993).
- 4. Arundo uses water that would otherwise support native riparian vegetation (Iverson, 1993; Zembal and Hoffman, 2000).
- 5. Arundo brings the threat of fire to riparian areas (Scott, 1993).
- 6. Localized eradication of Arundo is feasible. Best practices include eradicating upstream propagule sources first, using control methods that generally combine biomass removal with herbicide application during the fall, and follow-up monitoring and possible retreatment for up to 5 years (Omori, 1993; Jackson, 1993; Trumbo, 1999; Wijte, 1998).
- 7. Solarization by tarping Arundo stumps can be a very effective eradication method, but is

labor and material intensive and requires frequent maintenance; therefore, it is only recommended for small, easily accessible patches, out of the active channel, or in areas off-limits to herbicide use (Gaffney, 2002).

- 8. Permanently removing Arundo reverses the decline in ecosystem health by allowing native plant and animal populations and water and sediment patterns to reestablish (Gaffney, 2002).
- 9. Arundo invasion occurs widely and increasingly in CBDA streams (Dudley and Collins, 1995).

Key Uncertainties

General techniques for Arundo eradication are well established, and large-scale eradication projects have been successful, as described in Problem above. However, refinements are desirable, to increase the efficiency of eradication techniques (Fig. 2). More information is needed about the effects of different herbicides, herbicide dosages, and herbicide application timing, and how these effects change at sites of varying distance from the stream. (Hypotheses 1a, 1b, 1c). More clarity is needed about which types of sites require labor-intensive active restoration, as compared to passive revegetation by local propagule sources (Hypothesis 2). Documentation on the effect of Arundo removal on stream channel capacity is needed (Hypothesis 3). A key uncertainty for the Bay-Delta region is the present distribution of Arundo. This proposal includes an effort to map the distribution of Arundo in the CBDA region, which is essential for prioritizing the expenditure of eradication dollars.

Project Type

TAdN's previous CBDA project (Phase 1) was a pilot program of coordinated eradication of Arundo in five watersheds. Based on the success achieved with Arundo eradication and subsequent restoration since the mid-1990s as described in Problem, above, **we now propose a full-scale implementation project.** Enough is now known about how to eradicate Arundo to justify full-scale implementation, and the threat posed by Arundo invasion in CBDA watersheds makes such an approach appropriate.

Program Adaptive Management

This proposal builds on Phase I to develop **a regionally coordinated Arundo eradication program.** Our approach to coordinating all aspects of Arundo eradication and control—access to up-to-date technical information and the latest eradication methods, materials supporting landowner permission and regulatory compliance, and data collection for adaptive management—is intended to streamline and thus make more feasible the task of Arundo control for the CBDA region. Fig. 3 describes the operations and learning strategy of the program. The program's Steering Committee manages the program for Team Arundo del Norte. The Committee, comprised of experts from TAdN, meets quarterly to review and revise management strategy. They provide expert input for analysis of research and monitoring data, apply research findings to the revision of conceptual models and the development of new hypotheses, oversee program strategy and eradication priorities, and ensure that eradication partners are using the best available knowledge to guide eradication and restoration efforts.



We adaptively manage this program to make use of the latest information on the ecology and control of the weed to better address site-specific conditions (Fig. 3). We also adapt program management to address administrative challenges, such as regulatory issues, partner communication, property owner concerns, and legal or liability issues. Examples of such changes of approach are reflected in this proposal:

- The program's existing monitoring protocol, relying solely on data collected by eradication partners in the field, is inadequate to test program hypotheses. Therefore, we have engaged a weed scientist and an ecologist on the Steering Committee to improve experimental design, data collection, and analysis.
- As funding becomes more scarce and the threat of invasive species increases, it becomes more important to prioritize NIS resources. Therefore, we are proposing development of a regional map of Arundo infestations in the CBDA region, overlaid with natural resource and sensitive species habitat information to allow prioritization of eradication sites.

A3. APPROACH

Experimental Design and Monitoring

Experimental design and monitoring activities will be conducted by David Spencer (USDA Agricultural Research Service) and Tom Dudley (University of Nevada, Reno). Hypotheses 1a–1c focus on refinements to treatment techniques. Hypotheses 2–3 focus on riparian and geomorphological responses to eradication and restoration. If the results indicate that the techniques used by partners are not working as planned, the guidance offered to eradication partners can be adjusted to use more effective procedures. Statistical procedures will be calculated using SAS software (SAS Institute Inc. 1999).

Hypothesis 1a – Herbicide formulation and dosage affect treatment efficacy.

This experiment will be carried out at each eradication partner site. We will randomly designate

10 control and 10 treated Arundo clumps of similar size and condition. Treatment clumps will be treated with a back-pack sprayer. The standard herbicide treatment will be foliar spray with 2-3% solution of glyphosate, labeled for use in aquatic habitats. Control plants will be sprayed in a similar fashion, except that no herbicide will be included in the spray mix. The treatment unit will be an individual Arundo clump. Thus, there will be 10 replications for the treated plants and 10 for the control plants. Within each clump, 3 0.25 m x 0.25 m quadrats will randomly located, and the number of living Arundo stems in each quadrat will be counted. These quadrats are subsamples. Values from the three quadrats within each plant clump will be averaged and this mean value (number of stems per quadrat) will be used as the response variable in the statistical analysis. The location of each plant clump will be determined using a GPS capable of sub-meter accuracy, and marked by inserting a labeled metal rod into the substrate. We will use a portable Minolta SPAD-502 Chlorophyll meter to measure chlorophyll content of leaves in the quadrats (Gianquinto et al. 2003). This measure of leaf and stem viability will be repeated at monthly intervals post-treatment. Treatment effects will be tested statistically using a repeated-measures analysis of variance design. Data will be transformed if necessary so that they meet the assumptions of this parametric procedure. The number of stems present within a clump before and after treatment will be used to estimate the percent killed.

Table 1. Summary of experimental design.					
Hypothesis 1a	Control	Standard Glyphosate	Half Strength	Imorinur	
	Control	Treatment	Glyphosate	mazipyr	
	10 clumps	10 clumps	10 clumps	10 clumps	
Hypothesis 1b	Control	Max treatment	July treatment	October	
	Control	May ireatinent	July ileatificht	treatment	
	10 clumps	10 clumps	10 clumps	10 clumps	
Hypothesis 1c	Control	Zone 1	Zone 2	Zone 3	
	10 clumps	10 clumps	10 clumps	10 clumps	

We will test the effects of different herbicide rates and different herbicides. For example, imazipyr is a promising herbicide not well tested on Arundo. In this case the experimental design will include an additional 10 Arundo clumps for each different herbicide rate or herbicide.

Experience with Arundo regrowth after treatment indicates that new stems may appear in some treated areas and not others. Thus strictly relying on counts at the quadrat locations within a clump may miss the presence of Arundo regrowth. To avoid this, we will collect additional data by noting the presence/absence of new Arundo stems within a clump. Presence/absence data will be analyzed by logistic regression with the treatment as a covariate.

Hypothesis 1b – The timing of Arundo treatment affects treatment efficacy.

This hypothesis will be tested using the above experimental approach at a subset of eradication sites but applied at different times in Arundo's growing season (Table 1). This hypothesis and these dates build on recent research in southern California (Decruyenaere and Holt, 2001) concluding that chemical control with phloem-mobile herbicides would be most effective in late summer or early fall, when carbohydrates are moving from leaves to below-ground structures, but prior to natural leaf senescence.

Hypothesis 1c – The distance of the treatment site from the stream affects treatment efficacy.

Microhabitat differences—such as the distance from the stream edge, soil nutrient availability, soil moisture, or shading—may influence Arundo's ability to recover from various control techniques. To test this hypothesis, we will compare treatment efficacy using Arundo plants along a gradient of distance from the streamside as a proxy for microhabitat gradient. This information can be used to tailor treatment regimes to particular habitats.

This hypothesis will be tested using a modification of the above experimental approach. We will select a subset of eradication sites that have a relatively gradual microhabitat gradient away from the stream (Table 1). At these sites, we will designate 3 25-m wide zones parallel to the stream. One zone will be adjacent to the stream edge, one will be as far away from the stream edge as Arundo occurs for that habitat, and the third zone will be intermediate between the other two zones. Within each zone we will proceed with the experimental design described for hypothesis 1a. However, the statistical analysis will now include a second treatment which will be the zone. We will use a two-way analysis of variance design to test for differences due to herbicide treatment, zone, and the interaction between herbicide treatment and zone. A significant interaction term will indicate that treatment efficacy was influenced by zone, i.e., distance from the stream edge.

Hypothesis 2 – Active revegetation is required to achieve long-term recovery of native riparian vegetation at weed eradication sites.

Experience suggests that, at many eradication sites, active revegetation—including planting, irrigation, and weeding—is needed for recovery of native riparian vegetation and to prevent reinvasion by other weeds. However, this perception has not been well tested. Not all partners conduct active revegetation, because some sites have abundant propagule sources of native plants. Partners doing active revegetation after eradication are funding these efforts through sources others than CBDA, as part of this proposal's cost-share. This hypothesis will be tested using the following approaches.

- 1. At quadrats established to test hypotheses 1a, 1b, and 1c, we will record the presence of new species which occur within the plant clumps following treatment. No active revegetation will occur at these sites. Sampling will be at the same time that the number of Arundo stems are counted.
- 2. At partners' revegetation sites, we will run at least 5 transects perpendicular to the stream course, randomly located along the stream. We will locate transects in areas where active revegetation is occurring, and also where treatment sites are being allowed to revegetate passively. The length of the transects will depend on the distance from the streamside that the treatment area includes, but will not be less than 25 m or greater than 100 m. The beginning and end points will be recorded using GPS. At each 1 meter interval along the transect, the presence and cover (i.e., distance occupied along the transect) of species that intersect the transect will be noted (Brower et al. 1998). Plant species identification will be determined by personnel at the UC Davis Herbarium and voucher sheets prepared as appropriate. Determination of whether or not a species is native will follow the Jepson Manual (Hickman 1993).

These data will be tested statistically by calculating linear regression of the number of native species or the cover versus sample date. A significant positive regression coefficient will indicate that desirable revegetation is occurring. In addition, it will show the rate at which species are accruing or plant cover is increasing within the treated area. The different experimental conditions associated with hypotheses 1a, 1b, and 1c will allow for comparison of rates of revegetation under these conditions, i.e., when treatments are made at different times of the year, or with different herbicides.

3. Sixteen plots (5 m x 5 m) will be established within treated areas at eradication partners' sites. Eight plots will be planted with appropriate propagules (e.g., willow cuttings, etc.) for locally native riparian species and eight will be used as controls. At selected intervals we will return to record the species present within the plots and to collect growth measurements and survival of the planted propagules. Beginning 12 to 18 months after the plots were established, we will compare species composition in the two sets of plots (plots without added propagules vs. plots with added propagules). The cover of native species recorded over time for each plot will be used as the response variable in an analysis of variance.

Data collected by eradication partners on pre-treatment site characteristics (infestation patchiness, cover of native versus non-native species, infestation size and age) will be used to qualitatively assess whether revegetation success varies in response to these site characteristics.

Hypothesis 3 -- Stream channel capacity increases at Arundo removal sites.

Lack of agreement on whether Arundo infestation increases the likelihood of flooding is currently preventing some local utilities and governments from prioritizing Arundo eradication. Channel capacity is affected by Arundo eradication in three ways: the removal of Arundo biomass, subsequent changes to channel morphology as Arundo root masses degrade, and revegetation where Arundo once grew.

In conjunction with Mark Cocke (USDA NRCS, Davis, CA), we will test this hypothesis using the HEC-RAS model (Hydrologic Engineering Centers River Analysis System, US Army Corps of Engineers). This model simulates both steady and unsteady, one-dimensional, gradually varied flow in both natural and man-made river channels. The model estimates flow velocities and water level for a given flow. The stream velocity profile can be used to assess where erosion and deposition will occur. Water level information indicates the likelihood of flooding.

We will identify stream reaches at least 800 m in length at a subset of partners' eradication sites, including at least one partner site above a dam, one below a dam, and one control (no Arundo eradication). Before eradication, we will survey several stream cross sections and characterize the sediment composition (Wetzel and Likens 1991) within this reach. We will locate and measure the width / area of each clump of Arundo, and estimate the portion of the stream channel that is blocked by Arundo. After the winter following eradication, we will survey the reaches again. Several scenarios will be evaluated using the model. One scenario will be the pre-treatment stream condition, a second will remove the Arundo clumps from the input values for the model, and a third will be the stream condition after the first winter following eradication. These data will form a baseline that can be built on by future eradication efforts, beyond the life of this grant. As eradication and restoration sites age, they can be re-surveyed to track the riparian and fluvial changes that occur over time.

Coordinated Eradication and Restoration

The program chooses eradication sites/partners which meet most of the criteria listed below. Based on these criteria, 2 willing partners—Tule River and Ash Slough/Cottonwood Creek—have been removed since the first version of this proposal.

- Arundo is threatening high-value habitat in or affecting Ecological Management Units, such as spawning areas, sensitive species habitat, or protected natural areas included in the CBDA Multi-Species Conservation Strategy
- The site is highly restorable
- The site typifies Arundo's effects on typical landscapes and land uses in the CBDA region, such as Central Valley orchards or Coast Range viticulture or urban flood control channels, so that work there would result in learning that is widely applicable
- Arundo is substantially and imminently increasing flooding problems or fire threat
- There is a technically qualified, fiscally and administratively capable partner organization with access to the site

The program supports local eradication efforts with information, guidance, streamlined procedures, and funding. Program partners manage local decisions and responsibilities. **This proposal adds to the 5 existing Phase 1 eradication partners by funding eradication and monitoring by 5 new partners at multiple sites in 5 watersheds.** See program Location Map, Attachment B. The new partner groups or agencies are completely prepared to eradicate Arundo on their streams. The program guides partners to create an Eradication Plan. When the Plan is approved, the program delivers funds and expertise to partners to carry out planning, permitting, outreach, permission and access, eradication, and monitoring. Partners collect monitoring and surveying data using protocols developed by TAdN. Restoration guidance is provided to partners with projects requiring erosion control, bank stabilization, and native plant revegetation.

	Ecological	
	Manage-	
Stream	ment Unit	Species in Multi-Species Conservation Strategy (partial list)
Upper	Flows into	Northern Spotted Owl critical habitat, CA Red Legged Frog,
Cache	10.1	Foothill Yellow Legged Frog, Central CA Coast ESU Steelhead, CA
Creek*		Freshwater Shrimp, Valley Elderberry Longhorn Beetle, 22 more
Lower	9.2	Fall-Run Chinook, Central Valley ESU Steelhead, Valley Elderberry
American		Longhorn Beetle, Western Pond Turtle, Sacramento Splittail,
River		Northern CA Black Walnut
Lindo	7.3, 7.4	Valley Elderberry Longhorn Beetle, Spring Run Chinook, Central
Channel		Valley ESU Steelhead, Western Pond Turtle
San	12.4	San Joaquin Kit Fox, Bald Eagle, Valley Elderberry Longhorn
Joaquin		Beetle, Swainson's Hawk, Yellow-Billed Cuckoo, White-Tailed
River		Kite, CA Tiger Salamander, Western Pond Turtle, rookeries of Great
		Blue Heron and Great Egret
Gray	3.3, 7.7	Valley Elderberry Longhorn Beetle, CA Clapper Rail, Swainson's
Lodge		Hawk, Riparian Brush Rabbit, Greater Sandhill Crane, Giant Garter
Wildlife		Snake, Western Least Bittern, CA Tiger Salamander
Area		

Proposed new eradication partners, Phase II

* Site is an Arundo source upstream of major restoration efforts

Choice of eradication method depends on site conditions and infestation size. For large stands of pure Arundo with no immediate fire risk, the mature growth is sprayed and mowed or chipped later. If the infestation is small or consists of many isolated clumps, and the above ground biomass is mixed with desirable vegetation or posing a risk of fire to structures or trees, "cut-stump treatment" or "cut-resprout-spray" may be preferable. Loppers or a chainsaw are used to cut the Arundo in preparation for both methods. The final cut is made as close to the ground as possible (2-4 inches). For cut-stump treatment, full-strength glyphosate is applied to the cut stump. For cut-resprout-spray, the Arundo is allowed to regrow to a manageable height and sprayed.

Seasonal timing can also dictate which method to use. If it is logistically impossible to foliar spray in the fall when it is most effective, there is a wider window for cut-stump (Feb - Nov). However, fish and wildlife and potential runoff concerns must be considered. The CA Dept. of Fish and Game usually restricts vegetation removal during nesting season and herbicide applications during the rainy season.

Generally, the greatest cost of Arundo eradication is removing the voluminous canes, or biomass. Cutting and chipping can be accomplished with various types of heavy equipment at sites where their damage to the site is not prohibitive. Hauling and dumping is very expensive and often unnecessary. Recycling the biomass on site by mowing/mulching is cheaper, and the mulch can protect new plantings and can provide a barrier to subsequent weed invasions.

Five years of post-treatment monitoring and possible retreatment are required to completely eradicate Arundo. We are requesting funding to give the 5 currently funded partners an additional 2 years of retreatment and monitoring, for a total of 5 years. See Attachments C1–C5 for Arundo distribution maps of each current eradication partner.

Beyond the 5 new partners, we will identify organizations in areas where Arundo eradication is a high priority (see criteria at beginning of this section, and Mapping below), to **expand the dossier of potential Arundo eradication partners/stakeholders.**

We will upgrade TAdN's data management system, as follows. 1) Create an off-line version of the existing database in MS Access, to enable partners to work with their data more easily than in the web-based database. 2) Simplify monitoring and reporting protocols to minimize the time required of partners. With more of the research now conducted by professionals, segregated from partner responsibilities, partners can focus on information that is most relevant to their project management. 3) Add ready-made queries and reports to the database. The ability to query and produce progress reports will automate partner reporting and improve their ability to view their own progress. This added functionality will give project partners an incentive to input data and give them a new tool to manage their projects.

Mapping

Create a regional Arundo distribution map and eradication priority map

To date there is no state or Bay-Delta map of the distribution of *Arundo donax*. This information is critical to region-wide planning for its control. We will start with DOQQs from the California Spatial Information Library at CERES, and conduct interviews with knowledgeable people in each region to acquire additional information. The TAdN Arundo Mapping Protocol, based on the California Weed Mapping Standard, will be used to field map Arundo infestations with GPS

and aerial imagery in areas with missing or incomplete information. Distribution data will be included in databases by Cal-IPC and CDFA, and posted on the TAdN website using the map server developed in Phase 1. Combining this information with natural resource data (such as the Natural Diversity Database) in a GIS will highlight locations where Arundo threatens sensitive habitat and other resources in need of protection. Stream and terrestrial habitat values will be ranked using accepted sources such as State of the Estuary, Legacy Project, and CBDA Science Program. A flexible modeling framework will allow for changes in rankings of resource values or adding new features. The final map output will display "hot spots" or priority sites for Arundo eradication. This model will be a valuable tool for regional weed control planning and financial decision-making.

Partner on statewide invasive species mapping efforts

TAdN, Cal-IPC, and CDFA have worked together for years on a weed-mapping standard with the goal of improved geographic data sharing and state-wide maps of the state's worst weeds. At the Cal-IPC Symposium 2003, CDFA and Cal-IPC agreed to sponsor a workshop to develop a common geographic data management system based on the Weed Mapping Handbook (California Department of Food & Agriculture, 2002), and it was to continue this important work. TAdN will participate in the workshop and the cooperative effort to develop regional distribution maps of invasive plants other than *Arundo donax*, offering its Arundo mapping methods as an example for mapping other weeds.

Programmatic Permitting

Note that the budget for programmatic permitting accounts for numerous existing permits and is reduced from the previously submitted proposal because a) some partners have since finished phases that require permitting and b) one partner has been removed from the proposal.

Arundo eradication activities have the potential to cause sedimentation to streams and introduce herbicides to surface waters. These non-target effects are generally outweighed by the benefits of eradication; nonetheless, extensive permitting is required for eradication work. A comprehensive approach is needed to comply with CEQA and NEPA and obtain permit authorization from regulatory agencies for Arundo removal and associated activities (e.g., native plant revegetation, minor bank stabilization). In the absence of programmatic permits, partners will be able to implement Arundo eradication using existing permits for specified methods on previously identified sites, but they will be unable to use the heavy equipment that is sometimes appropriate for processing Arundo biomass from large infestations, and all permitting efforts will be unnecessarily redundant. The objectives of the comprehensive approach are to:

- Comply with and tier from requirements of the CBDA EIR/EIS and Record of Decision.
- Minimize the repeated need for compliance documentation and permit applications for the same resource enhancement activities.
- Maximize use of funding for on-the-ground implementation.
- Prepare documents and permit applications that can be used in different watersheds and acquire renewable permits, targeted to last 2 to 10 years.

This approach is modeled after successful programmatic environmental compliance and permitting approaches used in the lower Putah Creek watershed for riparian weed abatement and habitat restoration projects, funded, in part, through CBDA's first grant to TAdN. The permits cover 40 miles of lower Putah Creek. By not having to repeatedly prepare compliance documentation and permits, the program has saved CBDA, TAdN, and the local group tens of
thousands of dollars and enabled new landowners to join in with no delay. This has helped tremendously toward achieving ecosystem restoration on a watershed scale, an important consideration when addressing invasive weeds. EDAW, the firm that acquired the documents and permits for the Putah Creek program, will provide similar services for this proposal.

Anticipated permits and compliance documents needed are listed with the budget justification and a detailed workplan in Attachment D. Tasks include coordination with the lead agencies, development of the project description, project meetings, literature acquisition and review, database searches, site visits, resource assessments, impact analysis and development of avoidance measures, and other tasks as required.

Equipment and Training

The largest expense in Arundo eradication projects is cutting, processing, and removing the voluminous Arundo canes. Significant savings—on the order of 80% where equipment access is possible—can be realized by eliminating the need for extensive handling and hauling of biomass. Therefore, the program will identify and train 2 regionally-based eradication equipment operators and support them in obtaining appropriate equipment. The approach will follow a successful model by stakeholders in the upper Sacramento River region. They selected and trained a local operator to machine mow and mulch Arundo. This operator is invaluable to the Arundo eradication projects in the area. We propose adopting this approach by locating an operator in the Bay Area and one in the San Joaquin watershed. Funding for equipment purchases will be in lieu of work performed by the operator for eradication partners in that region. Equipment will then be the property and sole responsibility of the owner-operator. Equipment operators will be trained in the proper techniques of mowing and mulching Arundo to protect native habitat and wildlife.

A4. FEASIBILITY

All work funded by this program will comply with environmental regulations, including those governing use of herbicides near waterways. Our regulatory foundation is currently built on DFG 1603 permits, CEQA categorical exemptions, and Fish and Wildlife Service and National Marine Fisheries Service letters of concurrence with the Department of Pesticide Regulation determination that the program's methods of using glyphosate are "not likely to adversely effect" sensitive species. This letter of concurrence satisfies NEPA requirements for an informal consultation. New eradication partners will be able to reference and build on the regulatory compliance achieved by current partners. Our current (Phase 1) program is limited to Arundo biomass removal and spraying techniques defined as "hand-work"—those that use hand tools, not heavy equipment. We plan to expand eradication method options through proposed programmatic permitting.

The eradication of Arundo donax in participating watersheds is feasible because:

- Unlike many other weeds, Arundo can be eradicated because it does not produce viable seed.
- Its movement is limited to human introduction and downstream dissemination.
- The public and government agencies are responding to education outreach and publicity of the Arundo problem by providing political and monetary support.

The proposed coordinated approach for reducing Arundo's impacts on CBDA streams is appropriate because it:

- Focuses restoration resources where they will have the greatest benefit.
- Reduces costs, by centralizing many management functions.
- Reduces uncertainty by making information available on the best eradication and posteradication revegetation methods.
- Reduces regulatory barriers by developing programmatic permits.
- Offers a consistent program to evaluate performance and results.
- Standardizes record keeping and provides the means to compare results of multiple projects.
- Provides a model for NIS eradication and project management.
- Provides the institutional stability and continuity needed to manage projects requiring rigorous follow-up and long-term monitoring.

CBDA's three-year funding cycle is shorter than the five-year period required to achieve complete eradication. This proposal extends the monitoring period for currently funded partners. New partners will need an additional two years funding following the proposed fund period. We will pursue funding for a full five years of monitoring for all partners.

Access to properties where Arundo infestations are located can be a challenge. Most of our current and proposed partners have jurisdiction over or have already begun negotiating access to the lands where targeted eradication sites are located.

A5. PERFORMANCE MEASURES

1. To monitor the cumulative success of Arundo eradication and riparian restoration efforts, we will collect data from eradication partners, using protocols developed by TAdN. Controlled research data will be collected and analyzed separately from partners' monitoring efforts. Findings from the experimental component and from eradication partners will be compared. The table below summarizes data collected by partners, and its use in evaluating success:

Da	ta Collected by Eradication Partners	Data Evaluation
٠	Pre-eradication characterization of infestations, including acreage.	Compare treatment
٠	Treatment, timing, herbicide, dosage, biomass removal method	efficacy and cost of
٠	Photo documentation at eradication sites for 5 years	various methods.
٠	Retreatment activities for 5 years after first treatment	
٠	Treatment efficacy, i.e. kill-rate.	
٠	Eradication cost	
٠	Revegetation activities, including cost	Track effectiveness of
٠	Photo documentation at eradication sites for 5 years	post-eradication
٠	Percent cover of invasive plant species within 25 ft of the edge of	revegetation, whether
	eradication sites, before eradication and at follow-up visits	active or passive.

2. A questionnaire will be distributed to all partners and posted on the website to secure feedback on the overall effects the program has had on the Arundo eradication effort in the CBDA region.

3. A simple way to assess the program's usefulness is to evaluate the trend in website usage. Server statistics will be collected and assessed for this purpose.

A6. DATA HANDLING AND STORAGE

Collectively, partners' eradication and monitoring data, research team data, and regional map

development will provide TAdN and the CBDA invaluable information on the distribution, spread, and control of *Arundo donax*, and the efficacy and ecological effects of its removal. Phase 2 of the Arundo Eradication Program will expand the ability of the program to collect data of regional strategic importance.

The TAdN website, which includes the program's data, is currently housed at CERES. Data is made available for storage on paper or in digital format by the partners via an automated request function on the website. Under this proposal, data and information will be stored in GIS and database format at the Sonoma Ecology Center and copies shared with interested stakeholders, such as the Interagency Ecological Program and the Department of Water Resources Flood Control Division. Monitoring and research data will continue to be posted to a database on the TAdN website for storage, analysis, and dissemination. The map server being developed under Phase 1 will provide public access to Arundo distribution data, and enable users to locate eradication partners and their data by geographical area.. Stakeholder contact information will be available for networking purposes in accordance with the wishes of the stakeholder.

A7. EXPECTED PRODUCTS/OUTCOMES

The products, outcomes, and deliverables of the program are briefly summarized below. A detailed description can be found in Attachment A.

Coordinated Eradication and Restoration

- Approximately 223 acres of Arundo eradicated. Projects implemented by 5 new and 5 current partners at multiple sites in 10 watersheds. New partners trained to develop eradication plans, implement appropriate control methods, and to conduct monitoring using TAdN protocols.
- Planning, permitting, and implementation assistance with eradication site revegetation on a minimum of 223 acres.
- Two subregional owner-operators of eradication equipment trained, outfitted and hired.
- Increased capacity around the CBDA region to eradicate riparian weeds and restore riparian vegetation.

Adaptive Management

- Research and monitoring results that refine current knowledge about eradication and restoration techniques, allowing eradication and restoration prescriptions to be tailored for common site conditions found in the CBDA region.
- Evidence on the effect, if any, of Arundo eradication on channel capacity, thus providing a potential tool for floodway managers.
- Five years of treatment and monitoring data for current partners, three years for new partners.
- Continued development of the TAdN listserv, website and database, covering eradication methods, resources, monitoring data, and authoritative information on all aspects of Arundo control.
- Increased level of public awareness of Arundo, including education efforts directed at the general public, infestation area property owners, and local agencies.
- An editable and queryable database for project management and data sharing.
- Quarterly progress reports to CBDA. Yearly progress reports to TAdN. Final report.

Mapping

- Model and map of high-priority eradication locations, where Arundo threatens sensitive species, habitats, property, or other high-value resources.
- Strategic plan prioritizing Arundo eradication areas, with the partnerships identified that can

accomplish the eradication.

Programmatic Permitting

• Programmatic permits obtained for all participating partners. Significant time and cost savings for eradication partners and permitting agencies.

A8. WORK SCHEDULE (See Attachment A.)

B. APPLICABILITY TO CALFED ERP AND SCIENCE PROGRAM GOALS AND IMPLEMENTATION PLAN AND CVPIA PRIORITIES

B1. ERP, SCIENCE PROGRAM AND CVPIA PRIORITIES

This program directly addresses goals set forth by the CBDA NIS Strategic Plan and the ERP. The program addresses Goal 5 of the Ecosystem Restoration Program to "reduce negative biological and economical impacts of established non-native species," which is a BR-3 Bay Area priority and MR-1 multi-regional priority of this PSP. Relevant objectives include Objective 6 to "halt the introduction of invasive aquatic and terrestrial plants into Central California" and Objective 7 to "focus control efforts on those introduced species for which control is most feasible and of greatest benefit." The program addresses ERP priorities by improving and increasing aquatic and terrestrial habitats and ecological functions in the CBDA region. The program supports sustainable populations of diverse and valuable plant and animal species by removing a highly invasive plant that displaces these species. Removal of Arundo from stream channels prevents impediments and erosion that disrupt stream flow, cause flooding, and destabilize stream banks. Program objectives correspond with Goals I, II, and III of the NIS Plan to prevent and control the spread of NIS through appropriate management, and reduce their negative ecological and economic impacts. This program addresses the issues (NIS Plan) of leadership, authority and organization; coordination, cooperation, and partnership; and education and outreach by providing the following:

- A base of expertise and a conduit for information exchange.
- A single entity for coordination of Arundo eradication projects.
- Guidance for the best methods of project implementation and monitoring.
- Start-up of several projects in critical stream locations that would otherwise not move forward.
- Feeding new information from on-the-ground eradication, monitoring, and restoration into a shared information pool.

B2. RELATIONSHIP TO OTHER ECOSYSTEM RESTORATION PROGRAMS

The Arundo Eradication and Coordination Program is coordinating NIS eradication efforts with the CDFA Weed Management Area (WMA) Program. The WMA Program organizes eradication efforts on a regional basis and we hope to strengthen this effort through our program's goals. Our cooperation and partnership with CDFA and WMA members is necessary to coordinate effective eradication planning and implementation. The TAdN Arundo Eradication Program is emerging as a model for Weed Management Areas. The program takes a coordinated regional approach, using proven treatment methods and outreach techniques, and a standardized survey and monitoring protocol. Collaborating with the WMA program provides TAdN a broader NIS and multi-region context. The TAdN Arundo Eradication and Coordination Program remains closely linked to the California Invasive Plant Council (Cal-IPC), the California Native Plant Society, and the agencies and academic institutions represented by the diverse members of the TAdN Steering Committee. (See Qualifications, Section C.) The UC Davis Information Center for the Environment (ICE) and the California Resources Agency's CERES Program will continue to provide technology and database services for our program.

B3. REQUESTS FOR NEXT-PHASE FUNDING (See Section 4 below.)

B4. PREVIOUS RECIPIENTS OF CALFED PROGRAM FUNDING

The program has been in operation since May 2001. The first phase was titled the Arundo Eradication and Coordination Program, FWS Agreement #113320J033/ERP-00-E118 for \$818,045. This 3-year grant has been granted a \$245,550 extension until March 2006. As of March 31, 2004, the program has a balance of \$493,066. Progress and accomplishments for each of the current five partners as of December 2003 are summarized below. Maps showing partner progress are included in Attachment C.

				Restoration,
Stream	Permissions	Mapping	Treatment	monitoring
Napa River	46	183 infestations,	8 sites	46 properties
	properties	7 acres		
Sonoma Creek	75 sites	25 stream miles,	27 sites, 44	27 properties
		141 infestations	infestations	
San Francisquito	27	27 infestations, 1	25	20 properties
Creek	properties	acre	infestations	
Putah Creek	6 properties	405 infestations,	5 sites	6 properties
		21 acres		
Walnut Creek	8 properties	26 infestations,	900 sq ft	8 properties
		1455 sq ft		

Phase 1 coordination deliverables completed:

- Developed survey methods, mapping, and monitoring protocols and guidelines.
- Created field data collection forms based on the above protocols.
- Made all protocols, guidelines, and educational materials available on the TAdN website.
- Upgraded the TAdN information archive.
- Set up a program email listserv for communicating with the partners.
- Held quarterly Steering Committee meetings to guide the program.
- Staff met with each partner to help conduct initial surveys and GPS/mapping training.
- Disseminated Arundo educational materials to interested stakeholders throughout the state.
- Set up a database on 32 potential partners.

Phase 1 Adaptive Management actions taken:

- Developed guidelines for writing a revegetation/restoration plan.
- Established quality assurance standards for participating partners.
- Obtained regulatory compliance for Arundo removal methods short of using heavy equipment (see Feasibility).

B5. SYSTEMWIDE ECOSYSTEM BENEFITS

This program has several biological and ecological benefits:

- Preserve existing native riparian habitat and prevent further spread of Arundo infestations.
- Restore native vegetation and processes displaced and disrupted by Arundo.
- Restore habitat for native fish and other species that depend on native riparian vegetation.
- Conserve water resources by reducing the Arundo biomass in these waterways.
- Protect and restore natural stream geomorphic processes by preventing channel bed aggradation, severe bank cutting, and silt deposition caused by Arundo biomass buildup.
- Protect vegetation, bank stability, and streamside property by reducing the threat of flooding and fire brought by advanced Arundo infestations.

B6. LAND ACQUISITION PROPOSALS (not applicable)

C. QUALIFICATIONS

Team Arundo del Norte was formed to coordinate across organizations and jurisdictions on all matters concerning the control of the noxious weed *Arundo donax*. The work of TAdN is based on lessons learned from the original Team Arundo of Southern California, which generated valuable information on the ecology of Arundo in its invaded range, its effect on California's native ecosystems, and eradication techniques in its *Arundo donax* Workshop of 1993 and the resulting proceedings (Frandsen, et al, 1993).

This program's objectives are to 1. develop a body of high-quality information that can be shared and kept updated, and 2. to research and develop better techniques for Arundo control. The program utilizes the considerable resources already committed to the NIS management problem, drawing on a large group of experts and experienced practitioners from academic institutions, government agencies, non-governmental organizations, and private citizenry. Scientific research results, as well as techniques, innovations, and new approaches to challenging problems and best management practices are shared. This information is collected and disseminated for the benefit of partners and stakeholders.

Program Administration

<u>Program Administrator</u>: The Sonoma Ecology Center (SEC) has administered over \$5 million in grant projects, including 9 years experience coordinating local Arundo eradication efforts. Its earliest Arundo project led to the formation of Team Arundo del Norte, when SEC held a workshop to educate Northern California land managers on the ecological hazards of *Arundo donax* invasion. SEC is known for its watershed research, salmonid restoration, stakeholder problem-solving, and environmental education. Richard Dale is Executive Director.

<u>Program Coordinator</u>: Mark Newhouser, SEC. Mark has 20 years experience with community project planning and coordination, environmental education and outreach, and volunteer coordination. For the past seven years he has coordinated Arundo eradication efforts in the Sonoma Valley watershed, and since April 2001 has coordinated TAdN's Arundo Eradication and Coordination Program. Board member, California Invasive Plant Council.

<u>Research Supervisor:</u> Tom Dudley, Ph.D, Research Faculty, Department of Environmental & Resource Science, University of Nevada, Reno.

<u>Research Coordinator</u>: David Spencer, Ph.D., USDA-Agricultural Research Service, Exotic & Invasive Weed Research Unit, Weed Science Unit, University of California, Davis. Research in applied ecology of *Arundo donax* in Northern California.

<u>Programmatic Permitting Lead</u>: Ron Unger, Senior Restoration Ecologist, EDAW. Putah Creek Council.

<u>Information Technology and Data Management Advisor</u>: Deanne DiPietro, Research Associate, Sonoma State University. Board member, California Invasive Plant Council. Program liaison to CERES, ICE, and CSTARS. Background in environmental data management with CERES and ICE, remote sensing, and Arundo eradication in Sonoma Creek; TAdN founding member, webmaster, and listserv manager.

Steering Committee

(includes partial list of Advisory Committee members)

Gary P. Bell, Ph.D., The Nature Conservancy of New Mexico.

Mary Bettiga, MA. Agricultural Biologist, Napa County Agricultural Commissioners Office.

- Kristin Cooper-Carter, M.A., Computer Science and Technology, College of Engineering, California State University, Chico.
- Tom Dudley, Ph.D. University of Nevada, Reno. Board member, Cal-IPC.
- Karen Gaffney, Restoration Ecologist, Circuit Rider Productions, Inc.
- Jason Giessow, Santa Margarita and San Luis Rey Watersheds Weed Management Area and DENDRA Inc., Member, Cal-IPC Board of Directors.
- Jessie Giessow, Santa Margarita and San Luis Rey Watersheds Weed Management Area and DENDRA Inc.
- Richard G Holman, Computer Science and Technology, College of Engineering, California State University, Chico.
- Marc R. Horney, Ph.D., Adjunct Professor, California State University, Chico

Jan Lowrey, Cache Creek Conservancy Projects Manager, Cache Creek farmer/landowner.

- Rich Marovich, Streamkeeper, Putah Creek Coordinating Committee.
- Robyn Lee Myers, Ph.D., State Landscape Ecologist, Watershed Planning Services, USDA NRCS, UC Davis.

Michael Perrone, California Department of Water Resources, Division of Environmental Services.

Steve Schoenig, Invasive Species Coordinator, California Department of Food & Agriculture. Joel Trumbo, California Dept. of Fish and Game, Pesticide Investigations Unit. Ron Unger, Senior Restoration Ecologist, EDAW.

D. COST

D1. Budget (see Form 6)

D2. Cost-Sharing

The following cost-share commitments have been made for Phase 2 of the program.

Current Partners (5)	54,284	Other Sources	
Proposed Partners		CERES	10,000
Cache Creek	76,990	ICE	10,000
San Joaquin River	35,000	USDA ARS	58,800
Gray Lodge State Wildlife Area	29,220	SSU	10,000*
Lindo Channel		San Joaquin River Riparian	
	66,200	Restoration Program	75,000*
Lower American River	140,575	Subtotal:	\$163,800
Subtotal:	\$402,269		
		TOTAL:	\$566,069

*probable

E. LOCAL INVOLVEMENT

TAdN began as a local volunteer initiative, and is still dedicated to locally-led eradication efforts. Local partners control decisions regarding all aspects of Arundo eradication. Each eradication partner is also partnering with local organizations in their respective watersheds. RCDs, Adopt-a-Watershed programs, local conservancies, WMAs, and a multitude of agencies comprise coalitions being established to address the Arundo invasion. As the TAdN Arundo Eradication Program grows, more stakeholder groups and property owners will participate in eradication efforts. As awareness of the problem grows, these new stakeholders will provide access, volunteer labor, and the physical presence necessary to successfully monitor and eradicate Arundo. Most active weed management groups, native plant advocates, and restoration groups are aware of TAdN or already participating.

F. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

The applicant agrees to comply with all standard State and Federal contract terms.

G. LITERATURE CITED AND SUPPORTING RESEARCH

Agricultural Research, April 2001. Article and photos describing researchers' (UC Berkeley ecologist Thomas L. Dudley, ARS entomologists Raymond I. Carruthers and Alan A. Kirk, and ARS plant pathologist Timothy L. Widmer) search in Nepal for biological control agents for *Arundo donax*, tamarisk, and salt cedar. http://www.ars.usda.gov/is/AR/archive/apr01/path0401.htm

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Attachment A. Summary of Proposed Work to be Performed by Task with Schedules and Deliverables.

Schedules will be modified, depending on actual contract start and seasonal limitations.

Task	Start Date	Schedule	End Date	Deliverable
TASKS 1-10: ERADICATION				
General progress on eradication.	Contract signing	ongoing	end of contract	Final report including acreage eradicated, status of partner database, information and monitoring database and online products, and status of all other deliverables.
Monitoring implementation for current partners: Napa River, San Francisquito Creek, Sonoma Creek, Putah Creek, Walnut Creek	summer/fall, yr. 1, 2 o	yearly	end of year 2	Monitoring data posted on website, included in final report.
Eradication and monitoring work for ne Area	ew partners: Upper Cache (Creek, Lower A	merican River, Lindo C	hannel, San Joaquin River, Gray Lodge Wildlife
Eradication Plan	contract signing	NA	6 mo. after contract signing	Document to funder
Eradication	summer/fall, yr. 1, 2	yearly	summer/fall, yr. 2, 3	Included in quarterly reports
Monitoring Implementation	summer/fall, yr. 1, 2	yearly	3 yr. after eradication	Monitoring data posted on website,
TASK 11: COORDINATION AND ADI	MINISTRATION			
Quarterly reports (fiscal and progress)	contract signing	quarterly	3 yr. after contract signing	Quarterly reports (fiscal and progress)
Steering Committee mtgs.	end of 1 st quarter fol. contract signing	quarterly	3 yr. after contract signing	Agendas & meeting minutes, listserv notification
Add potential partners	contract signing	quarterly	3 yr. after contract signing	10-20 potential partners/stakeholders added to database

Task	Start Date	Schedule	End Date	Deliverable
Assist new partners	contract signing	as needed	3 yr. after contract signing	List of current partners, on-site meetings, phone/email support to help with surveying, mapping, eradication, reveg, monitoring.
Final report	2.5 yr. after contract signing	NA	3 yr. after contract signing	Document to funder, posted to website
TASK 12: DATA/INFORMATION COO	ORDINATION			
Training & support for eradication partners in use of Arundo database	contract signing	ongoing	end of Year 1	Revised "How to Use" instructions
Instructional materials for using Arundo database	contract signing modifications	ongoing	end of project	Web pages & hardcopy materials
Gather new, authoritative Information on the latest research, education, and outreach materials.	contract signing	ongoing	end of project	Website and listserv updates
Enter descriptions of new partner projects into Natural Resource Projects Inventory (NRPI). Update current project descriptions.	contract signing	ongoing	end of project	Data in NRPI with links from website
Online access to monitoring data & project info., including graphic user interface (map server).	contract signing	ongoing	updated until end of project	Web/database application for posting monitoring data and the data itself. Ready-made queries and reports. Offline version.
TASK 13: MAPPING				
Gather surveying and monitoring data on Arundo eradication within CBDA region and enter into a searchable database.	contract signing	ongoing	end of project	A searchable database of information from partner projects on the TAdN website website using the program's map server.
Consolidate existing data into a comprehensive regional record of Arundo distribution in the CBDA region	contract signing	ongoing	end of project	A Bay-Delta regional distribution map of <i>Arundo dona</i> x.

Task	Start Date	Schedule	End Date	Deliverable
Develop a model for prioritizing areas for Arundo eradication using existing Arundo infestation data and standards for ranking habitat value.	contract signing	ongoing	end of project	GIS dataset of Bay-Delta's high-value natural resource areas superimposed on regional Arundo distribution map. Recommended eradication actions including partnerships.
Participate in invasive species mapping workshops with CallPC and CDFA, using TAdN protocols as model for mapping other weeds.	contract signing	as needed	end of project	Development of multiple-weed mapping protocol.
TASK 14: EXPERIMENTAL DESIGN				
Test hypotheses.	contract signing	ongoing	end of project	Report describing methods, results of statistical tests, and discussion of results in relation to program goals.
TASK 15: PROGRAMMATIC PERMIT	-			
Obtain programmatic environmental compliance for all partner projects.	contract signing	ongoing	end of project	Permit covering current and proposed partners' work, progress. Report on obtaining programmatic permit for any Arundo eradication project following TAdN protocols.
TASK 16: EQUIPMENT AND TRAININ	<u>1G</u>			
Provide equipment operators with training and equipment for mowing and mulching Arundo on-site.	contract signing	ongoing	end of project	Trained and retooled equipment operators in two CBDA subregions: the Bay Area and the San Joaquin River Watershed.

CLICK HERE FOR ATTACHMENT B. Arundo Eradication Partner Sites IN JPG FORMAT

CLICK HERE FOR ATTACHMENT C1. Napa River Arundo Infestation Sites IN JPG FORMAT

CLICK HERE FOR ATTACHMENT C2. San Francisquito Creek Bank Stabilization and Revegetation Existing Conditions IN JPG FORMAT

CLICK HERE FOR ATTACHMENT C3. Sonoma Creek Watershed Arundo donax Infestations IN JPG FORMAT

CLICK HERE FOR ATTACHMENT C4. Arundo Distribution in the Lower Putah Creek Watershed IN JPG FORMAT

CLICK HERE FOR ATTACHMENT C5. Arundo Distribution in Walnut Creek IN JPG FORMAT

Subtasks for Level Four—Programmatic Permitting

Subtask 1. Coordination with Regulatory Agencies/Development of Permitting Approach

Under this task, EDAW would work with TAdN, the proposed partners, and the regulatory agencies to determine the best compliance and permitting strategy for the proposed project, including the development of environmentally protective protocols for arundo abatement activities. The project area spans multiple jurisdictions (i.e., San Francisco/ Sacramento Districts of the USACE, DFG regions, RWQCB regions) and it is unknown at this time if one jurisdiction would take the lead for multiple project sites, or if multiple applications to different Districts would be required. Likewise, it would be determined if one "umbrella" compliance and permitting approach would be preferable or if a watershed-by-watershed approach would be more feasible. The appropriate lead agencies for CEQA and NEPA compliance, and the permit applicants for CWA Section 404 and 401, and DFG Section 1600 Streambed Alteration Agreements would also be determined. The outcome of Task 1 will affect the approaches taken in Tasks 2–11 below.

The scope and budget assumes that a unified CEQA/NEPA CAT EX will be prepared and that two umbrella permit applications would be prepared for each of Sections 401, 404 and 1600. The umbrella permits would be prepared for the resource agencies to cover the project sites within their jurisdiction. Other permits (e.g., air quality, NPDES, etc.) are expected to be developed by the project applicant and are therefore not included in this budget but could be completed by EDAW under an amendment to this scope of work.

Subtask 2. Prepare CEQA and NEPA Compliance Documents

Under this task, EDAW would work with the respective partners for each watershed or TAdN to prepare the administrative draft, public draft, administrative final, and final environmental compliance documents assumed to be a single, joint document. Other services included would be coordination with the lead agencies, TAdN and the partners, project meetings, project management, budget administration, and site visits as required. It is assumed that up to three meetings will be required during the environmental document preparation. It is also assumed that the project description will be compiled collaboratively by EDAW and the partners. The partners would be responsible for collecting and providing EDAW with background environmental documentation, aerial photographs, maps, and results of previous resource inventories. The CEQA/NEPA document will tier from the CALFED Bay-Delta Authority (CBDA) FEIR/EIS. The estimated budget prepared for this project is based on the anticipated development of a unified CAT EX. If multiple CAT EX's or Initial Study Negative Declarations (ISND) or a unified EIR or multiple EIRs are needed for this project, a budget adjustment will be required to accommodate the additional effort needed.

Subtask 3. Preparation of Nationwide Permit 27 Application under Section 404 of the Clean Water Act

It is assumed the proposed Arundo removal project would qualify for a U.S. Army Corps of Engineers (USACE) Nationwide 27 permit covering habitat restoration activities. EDAW will prepare the Nationwide 27 permit application and request a Letter of Permission under the Rivers and Harbors Act for submittal to USACE. Depending on the outcome of coordination with the regulatory agencies in Task 1, an application package may be prepared for each

watershed/partner or a joint "umbrella" application may be filed. The application package(s) will consist of form Eng 4345, a project description, the project purpose, USACE jurisdiction on the project site, potential impacts and proposed mitigation if required. As part of the Nationwide permit application, a mitigation plan is typically required to address potential project impacts. The need and scope of this plan will be determined through consultation with the USACE regulatory personnel and a scope and cost estimate will be prepared by EDAW at that time. Therefore, the cost for developing a mitigation plan is not included in the cost estimate for this task. The budget is based on preparation of two permit applications, one submitted to each of the San Francisco and Sacramento District offices for the project sites within their jurisdiction. It is assumed that detailed delineations of Waters of the United States will not be required with these submittals, consistent with requirements for a Nationwide 27 permit application. If the project doesn't qualify for a Nationwide 27 permit and a detailed delineation of Waters of the United States is required, a scope and budget adjustment will be needed.

Subtask 4. Preparation of Application for a Streambed Alteration Agreement

All diversions, obstruction, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources is subject to the regulations of the California Department of Fish and Game (DFG) pursuant to Section 1600 through 1603 of the Fish and Game Code. Sections 1601 to 1603 state that it is unlawful for any person to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by DFG, or use any material from the streambed, without first notifying DFG of such activities. A DFG Streambed Alteration Agreement must be obtained for any project that would result in impacts to a river, stream, or lake. EDAW will submit a completed 1601/03 Streambed Alteration Agreement application to DFG for proposed activities that would result in the potential alteration of the bed and bank of the involved streams. Depending on the results of Task 1, a single permit application may be submitted for each watershed, or one "umbrella" application covering all proposed activities may be submitted. A certified CEQA document will be required to accompany the Streambed Alteration Agreement application. This proposal assumes that DFG will permit the American River, Upper Cache Creek, San Joaquin River, and Lindo Channel as a single project and will use the CEQA document prepared in Task 1 for its agreement review. It is further assumed that the other listed project sites remain covered by previously acquired permits and no further permit applications will be required for those sites, including renewals for existing permits. If separate permit applications for the four sites are required, or additional permits or renewals are needed, the scope and budget will need to be adjusted to accommodate the increased effort needed.

Subtask 5. Preparation of Application Package for Regional Water Quality Control Board Clean Water Certification

The Regional Water Quality Control Board (RWQCB) promulgates and enforces water quality standards to protect water quality in California. The RWQCB has jurisdiction over all Waters of the United States, including wetlands. Most projects requiring a Section 404 permit also require Clean Water Certification.

Once USACE has verbally approved the project, EDAW will send a letter(s) of application to the RWQCB for water quality certification. Depending on the outcome of Task 1, a single letter for all watersheds may be sent, or a separate letter may be sent for each partner watershed. It is assumed that a consultation meeting will not be needed with the RWQCB. A certified CEQA document will be required to accompany the water quality certification application.

The budget is based on preparation of two permit applications, one submitted to each of the San Francisco and Central Valley Regional offices for the project sites within their jurisdiction.

Subtask 6. Department of Water Resources (DWR) Reclamation Board Encroachment Permit

The reclamation board has jurisdiction over levees along rivers and streams in California. Work within leveed or designated floodway segments of any stream would likely require an Encroachment Permit from the Reclamation Board. A certified CEQA document will be required to accompany the Encroachment Permit application. Typical concerns of the Reclamation Board are increases in roughness in the channel or any activities which may cause maintenance problems. If determined necessary during Tasks 1 and 2, EDAW will prepare an application for an Encroachment Permit for work within the leveed or designated floodway reaches of the respective streams and rivers. The scope and budget assume that no hydrological modeling or quantitative estimation of changes to roughness will be required for this project. It is also assumed that no Encroachment Permits will be required. If, however, permit applications are determined to be required, a scope and budget adjustment will be needed to prepare the permit applications.

Subtask 7. Coordination with USFWS Regarding Federally Listed and Proposed Species

Compliance with the federal Endangered Species Act (ESA) is required for project implementation. Under this task, EDAW will informally consult with USFWS regarding federally listed and proposed species. It is assumed that impacts to the species can be avoided through timing and protective measures, and that the informal consultation would suffice. This scope assumes that a Biological Assessment will not be required for this project. However if, due to the geographic scope of the project, the USFWS determines that a Biological Assessment is needed in support of a Biological Opinion, the scope and budget will need to be amended.

Subtask 8. Informal Consultation with NOAA Fisheries Regarding Listed Fish Species

Based on EDAW's understanding of the project, it is assumed the project would not take or adversely effect federally or state-listed fish species. To confirm this assumption, EDAW biologists will conduct informal consultation with the NOAA Fisheries. This informal consultation would include initial coordination with NOAA Fisheries to determine potential project effects on listed species, and consultation under Section 7 of the Endangered Species Act. This proposal assumes that take avoidance is feasible and does not include formal Section 7 consultation with NOAA Fisheries. This scope assumes that a Biological Assessment will not be required for this project. However if, due to the geographic scope of the project, NOAA Fisheries determines that a Biological Assessment is needed in support of a Biological Opinion, the scope and budget will need to be amended.

Subtask 9. Coordination with CDFG Regarding State-Listed and Proposed Species

Compliance with the CDFG and the California Endangered Species Act (CESA) is required for project implementation. Under this task, EDAW will informally consult with CDFG regarding state-listed and proposed species. It is assumed that impacts to the species can be avoided through timing and protective measures and that the informal consultation would suffice. Therefore, it is assumed that a Section 2080 and/or 2080.1 permit would not be required from CDFG.

Subtask 10. Cultural Resources Compliance

Federal actions, including the issuance of a Section 404 CWA permit, require compliance with Section 106 of the National Historic Preservation Act. Under this task, Section 106 compliance would be obtained by EDAW in support of the 404 application process. The presence of significant cultural resources in the project areas would be assessed through a record search at the North Central Information Center of the California Historical Resources Information System, and through contact letters with the Native American Heritage Commission (NAHC), the State Historic Preservation Officer (SHPO), and individuals or organizations that may have knowledge of or interest in cultural resources at the project sites.

Subtask 11. Resource Assessment

Many permitting requirements are driven by the presence of sensitive biological resources (i.e., special-status species, wetlands) in the project areas. The presence of sensitive biological resources will be determined through:

- database searches (California Natural Diversity Data Base, California Native Plant Society Electronic Inventory)
- review of environmental compliance documents for the area (if available)
- review of previous mapping efforts
- interviews with knowledgeable individuals

Where necessary to fulfill permitting requirements, the available documentation will be supplemented by field surveys. Sensitive resources surveys will be conducted in coordination with partners to maximize efficiency in acquiring field data.

Attachment D. Budget and Budget Justification Subcontractor: EDAW. Level Four, Task 17, Years 1 to 3 Budget Justification

	Environmental Compliance Documentation and Permitting Needs									
Watershed Partner	CEQA CAT EX	CEQA Lead Agency	NEPA CAT EX or FONSI	NEPA Lead Agency	401	404	1600	USFWS	NOAA	Other
Existing Partners:										
Napa River	X	CDFG or local	NA	NA	Х	X	0	Х	X	Air Quality Board Permit
Sonoma	X	CDFG or	NA	NA	NA	NA	0	Х	X	
Creek Putah Creek	0	Solano Co. Water Agency	NA	NA	NA	NA	0	Х	X	
Walnut Creek	X	CDFG or local	NA	NA	NA	NA	0	Х	Х	
New Partners:										
American River	X	Sacramento City Dept. of Parks and Recreation	NA	NA	NA	NA	Х	0	0	
Unner	X	Lake Co	ΝΔ	ΝΔ	X	X	Y	×	×	Grading
Cache Creek		Community Development Dept.					~	~	~	Permit
Grey Lodge Wildlife Area	0	CDFG	NA	NA	NA	NA	NA	0	NA	CA Restricted Materials Permit (Obtained)
San Joaquin River	X	CDFG or local	Х	Bureau of Reclamation	Х	X	Х	Х	X	
Lindo Channel	NA	City of Chico (if required)	NA	NA	X	X	Х	Х	X	
Total Required:	6	/	1		4	4	4	7	7	

Notes: NA = Not applicable O = Obtained

X = Needed

Attachment D. Budget and Budget Justification Subcontractor: EDAW. Level Four, Task 17, Years 1 to 3 Budget

Budget: Environmental Compliance Documentation and Securing Permits						
Document/Permit	Number Required	Unit Cost	Total Cost	Estimated Hours		
CEQA/NEPA	1	\$30,000	\$30,000	352 @ \$85/hour		
(CAT EX)						
Section 401	2	\$4,000	\$8,000	94 @ \$85/hour		
Section 404	2	\$18,000	\$36,000	424 @ \$85/hour		
Section 1600	2	\$14,000	\$28,000	329 @ \$85/hour		
USFWS/NOAA	7	\$5,000	\$35,000	412 @ \$85/hour		
Total			\$137,000	1611 @ \$85/hour		

Attachment D. Budget and Budget Justification. Subcontractor: USDA, David F. Spencer ARS Level Three, Task 16, Years 1 to 3 Budget

ltem	1st Year	2nd Year	3rd Year	Total
PGR Sten 1	\$32,000	\$32.960	\$33.949	\$98 909
Fringe @29%	\$9,280	\$9,558	\$9,845	\$28,684
Student (8\$ /hr)	\$9,600	\$9,600	\$4,800	\$24,000
Supplies	\$3,000	\$2,500	\$2,500	\$8,000
Plant ID @ \$30 each	\$7,500	\$4,500	\$3,000	\$15,000
Travel	\$2,000	\$2,000	\$2,000	\$6,000
sub Total	\$63,380	\$61,118	\$56,094	\$180,592
Indirect @ 11 %	\$6,972	\$6,723	\$6,170	\$19,865
Total	\$70,352	\$67,841	\$62,264	\$200,458

Attachment D. Budget and Budget Justification. Subcontractor: USDA, David F. Spencer ARS Level Three, Task 16, Years 1 to 3 Budget Justification

All applicants must complete this form for their proposals. <u>Failure to answer these</u> questions will result in the application not being considered for funding.

Budget Form Instructions

Direct Labor Hours. Provide estimated hours proposed for each individual.

PGR, Step 1, 2000 hours / year for 3 years equals 6000 hours.

Student Assistants II, 1200 hours / year for 2 and 600 hours / year for 1 year equals 3000 hours.

Salary. Provide estimated rate of compensation proposed for each individual.

PGR, Step 1, \$31,500 for year 1, \$32,445 for year 2, and \$33,418 for year 3.

Student Assistant II, \$8 / hour.

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

PGR, Step 1, benefits are calculated at 29%

Student Assistant II, no benefits are provided

Travel. Provide purpose and estimate costs for all non-local travel.

Travel will be to and from sampling sites located from Williams, CA to Madera, CA. It is estimated that \$2000 / year will cover gas, vehicle repair, per diem, and lodging expenses. Most visits will be completed in 1 day.

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

Expendable supplies in the amount of \$3000 will be allocated approximately at \$400 for laboratory supplies, and \$2600 for field supplies in the first year. Amounts requested in years 2 and 3 (\$2500 / year) will follow the same proportion.

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

The UC Davis Herbarium charges \$30 to identify an unknown plant sample. The budget include \$7500 during year 1, \$4500 during year 2, and \$3000 during year 3 to pay for this service. No other services or consultants will be used.

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

NONE

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentations, response to project specific questions and necessary costs directly associated with specific project oversight.

Project management relating to the collection and interpretation of the scientific data collected to test hypotheses 1 to 4 will be conducted by Dr. David Spencer. There is no additional charge for this.

Other Direct Costs. Provide any other direct costs not already covered.

NONE

Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs. *[CORRECTION: If overhead costs are different for State and Federal funds, note the different overhead rates and corresponding total requested funds on Form I - Project Information, Question 17a. On Form VI - Budget Summary, fill out one detailed budget for each year of requested funds, indicating on the form whether you are presenting the indirect costs based on the Federal overhead rate or State overhead rate. Our assumption is that line items other than indirect costs will remain the same whether funds come from State or Federal sources. If this assumption is not true for your budget, provide an explanation on the Budget Justification form.] Agencies should include any internal costs associated with the management of project funds.*

The United States Department of Agriculture, Agricultural Research Service, charges a standard overhead rate of 11%.

Attachment D: Budget and Budget Justification. Subcontractor: Lindo Channel, Level One, Task 14, Years 1 to 3 Budget Justification

All applicants must complete this form for their proposals. <u>Failure to answer these</u> questions will result in the application not being considered for funding.

Budget Form Instructions

Direct Labor Hours. Provide estimated hours proposed for each individual.

Carter - 1150 hours

Griggs/Hubbell/Cole - 365 hours

Lundberg (Mapping) - 86

Strachan - 560

Student Assistants - 460

Salary. Provide estimated rate of compensation proposed for each individual.

Carter - \$34

Griggs/Hubbell/Cole - \$40

Lundberg - \$35

Strachan - \$18

Student Assistants - \$12

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

Salaried Employees - 34-38%

Students and part-time employees - 15%

Travel. Provide purpose and estimate costs for all non-local travel.

324 miles per month for the life of the contract.

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

Office supplies	\$3600
Printing	\$1250
Postage	\$400
Phone/FAX	\$2445
Computing	
supplies, digital	
camera, field	
supplies	\$5300

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

Sole Terra Farming - \$24,000 for cutting and mulching - \$1000 per day for a crew of 8-12

Sole Terra Farming - \$3,200 for herbicide applications – Approximately \$1,000 per application

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

No such equipment will be used.

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentations, response to project specific questions and necessary costs directly associated with specific project oversight.

Project management costs are captured under the project administration line item. These tasks will be completed jointly between Carter and Strachan. Carter will oversee all contracting needs, budget allocations, cost verifications, work inspections, report development, presentations and will serve as the main point of contact. Strachan will assist in developing the various reports, help to over-see the on-the-ground crews and will attending coordinating meetings in Carter's absence. The total cost for project management is \$28,550.

Other Direct Costs. Provide any other direct costs not already covered.

No other costs to report

Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs. *[CORRECTION: If overhead costs are*

different for State and Federal funds, note the different overhead rates and corresponding total requested funds on Form I - Project Information, Question 17a. On Form VI - Budget Summary, fill out one detailed budget for each year of requested funds, indicating on the form whether you are presenting the indirect costs based on the Federal overhead rate or State overhead rate. Our assumption is that line items other than indirect costs will remain the same whether funds come from State or Federal sources. If this assumption is not true for your budget, provide an explanation on the Budget Justification form.] Agencies should include any internal costs associated with the management of project funds.

The indirect rate charged by the Research Foundation for all state contracts is 20%. These fees are those costs that cannot by their nature be specified on a project-byproject basis in the same way that line item direct costs can. Generally, indirect costs are those that support project activities, as compared to those that are directly related to specific project tasks. Universities establish an indirect cost rate with the Federal Government by following the appropriate provisions of OMB Circular A-21. This circular was officially modified and reissued on May 8, 1996, which, among other things, changed the term "indirect costs" to "Facilities and Administrative (F&A) Costs." The circular spells out two methods for determining such costs. We use the "Simplified Method" for institutions with less than \$10 million in awards annually from the Federal Government. Currently, we have two rates approved by our lead Federal agency, Health and Human Services: 45% of salaries and wages for on-campus projects and 20% of salaries and wages for offcampus projects. May Wong (415-556-1704) is our contact and can provide verification of our rate which her office approves after reviewing our financial statements.

Attachment D: Budget and Budget Justification. Subcontractor: San Joaquin River, Level One, Task 13, Years 1 to 3 Budget Justification

All applicants must complete this form for their proposals. <u>Failure to answer these</u> questions will result in the application not being considered for funding.

Budget Form Instructions

Direct Labor Hours. Provide estimated hours proposed for each individual.

\$2,500 is for a lead coordinator to facilitate the development of the Coordination Group and obtain in-kind services and support from all willing partners.

Salary. Provide estimated rate of compensation proposed for each individual.

Funds for salaries will be provided in-kind.

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

Travel. Provide purpose and estimate costs for all non-local travel.

Travel outside of the non-local area is not anticipated.

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

All supplies and expendables are anticipated to be provided by the partners.

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

CBDA funding in year 1 through 3 will be used to obtain the subcontractor services and the associated contract administration.

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

All equipment required will be sought from the partners.

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation

of costs, report preparation, giving presentations, response to project specific questions and necessary costs directly associated with specific project oversight.

Its anticipated in-kind services in the amount of \$2,500 will be applied to project management in year one; \$5,000 in year 2, and \$10,000 in year 3.

Other Direct Costs. Provide any other direct costs not already covered.

Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs. *[CORRECTION: If overhead costs are different for State and Federal funds, note the different overhead rates and corresponding total requested funds on Form I - Project Information, Question 17a. On Form VI - Budget Summary, fill out one detailed budget for each year of requested funds, indicating on the form whether you are presenting the indirect costs based on the Federal overhead rate or State overhead rate. Our assumption is that line items other than indirect costs will remain the same whether funds come from State or Federal sources. If this assumption is not true for your budget, provide an explanation on the Budget Justification form.] Agencies should include any internal costs associated with the management of project funds.*

Attachment D: Budget and Budget Justification. Subcontractor: American River, Level One, Task 9, Years 1 to 3 Budget Justification

All applicants must complete this form for their proposals. <u>Failure to answer these</u> questions will result in the application not being considered for funding.

Team Arundo del Norte – Arundo Eradication Partnership Proposal Sacramento Region – American River and Feeder Streams

Budget Form Instructions

Direct Labor Hours. Provide estimated hours proposed for each individual.

American River Parkway Foundation-Executive Director	108	
Project Director	648	
Assistant Project Director-Volunteer Team Leader	792	
Administrative Assistant	324	

Salary. Provide estimated rate of compensation proposed for each individual.

American River Parkway Foundation-Executive Director	\$40.00
Project Director	\$35.00
Assistant Project Director-Volunteer Team Leader	\$27.50
Administrative Assistant	\$25.00

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

Included in salary level - "Loaded rate"

Travel. Provide purpose and estimate costs for all non-local travel.

Due to the size of the region involved and the nature of field work, reimbursement for local staff travel mileage is essential. (Volunteers are not reimbursed, nor are volunteer travel costs calculated independently of the general value for volunteer hours.) All travel will be in private cars. The standard rate used by the American River Parkway Foundation to reimburse staff for business travel is \$0.365 per mile. Some out-of-area travel will be required, such as to TAdN quarterly meetings. Mileage estimates and costs have been provided for each task for each year in the proposed budget. Total costs for travel includes:

Task	Projected Miles	Cost	
Mapping	1600	\$584	
Eradication	4000	\$1,460	
Monitoring	1000	\$365	
Coordination	2395	\$874	
Total projected miles and travel cost:	8995	\$3,283	
(Approximately 3000 miles per year)			

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

Field Supplies		
GPS unit		\$300.00
Loppers	15 @ \$35	\$525.00
Gloves	20 @ \$15	\$70.00
Herbicides	-	\$600.00
Digital camera		\$440.00
Total		\$1,935.00

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

Certified herbicide applicator	
\$80 – Rate subject to negotiation	\$4000.00

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

None

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentations, response to project specific questions and necessary costs directly associated with specific project oversight.

Project management for a community-based volunteer program includes standard management duties such as communications, fiscal record supervision, preparation and processing of personnel and contract documents, and eradication/monitoring program reporting, It also includes field responsibilities, such as inspections, volunteer crew leader training, mapping documentation, preparation of daily work reports, and completing onsite inspections . Finally, and unique to a community-based initiative, project management includes planning and implementing an extensive community outreach effort, developing partnership agreements with collaborating organizations, seeking long term local business support, and maintaining media contacts to publicize the environmental stewardship work volunteers are accomplishing. The time allocations cover only a bare minimum of the time that will actually be devoted to these types of comprehensive community stewardship development and volunteer outreach functions. It should be noted, that because of the long term nature of these types of activities, no mileage reimbursement is included in the budget for volunteer outreach

Project Coordination/Administration and Project Reporting are divided in the Proposed Budget as separate tasks.

The following hours and salary costs are projected for Project Management and Administration:

Position	Projected Hrs/Year	Total Hours	Projected Cost
American River Parkway Foundation-			
Executive Director	36	108	\$4,320
Project Director	42	126	\$5,040
Total	78	234	\$9,360

The following hours and salary costs are projected for Project Reporting, including establishing the GIS data base and mapping based on TAdN protocols, maintaining the volunteer data base, completing Daily Logs for volunteer work groups, and preparing quarterly and final TAdN reports:

Projected	Total	Projected
Hrs/Year	Hours	Cost
18	54	\$1,890
12	36	\$990
<u>36</u>	108	\$2700
66	198	\$5580
	Projected Hrs/Year 18 12 <u>36</u> 66	Projected Total Hrs/Year Hours 18 54 12 36 36 108 66 198

Other Direct Costs. Provide any other direct costs not already covered.

Printing-flyers/brochures; office supplies, postage	\$720
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Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs).

Overhead – standard general office requirements – 10%	\$6,682
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Attachment D: Budget and Budget Justification. Subcontractor: Cache Creek, Level One, Task 11, Years 1 to 3 **Budget Justification**

Direct Labor Hours

Alex Straessle- Water Resources Specialist	850 hours
Tony Gallegos- Water Resources Program Manager	686 hours
Tom Smythe- Water Resources Engineer	2 hours
Skip Simkins- Clear Lake Lands Coordinator	32 hours
Volunteer Labor (Lake County CRMP groups)	694 hours
Natural Resources Conservation Service (in-kind)	20 hours
Total Hourly Rate	
Alex Straessle- Water Resources Specialist	\$38.34/hour
Tony Gallegos- Water Resources Program Manager	\$52.10/hour
Tom Smythe- Water Resources Engineer	\$78.10/hour
Skip Simkins- Clear Lake Lands Coordinator	\$50.09/hour
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Volunteer Labor (Lake County CRMP groups) 694 hours Natural Resources Conservation Service (in-kind) 20 hours

Benefits

Included within the total hourly rate.

<u>Travel</u>

Travel is figured in to program categories.

Supplies and Expendables

Services or Consultants

Pestmaster Services- This licensed applicator will be used for the eradication of Arundo donax. Costs are estimated from previous invoices for Arundo eradication on a lump sum basis per number of sites. (Flood Control Zone 8: Arundo donax control for 16 sites by the cut resprout and spray method \$6,000)

West Lake Resource Conservation District- The RCD will be working with the County through all phases of this project. Services are eradication, monitoring, site information, education outreach and coordination, investigation of restoration and revegetation options and assisting in the development of a management plan.

Equipment

A County boat will be used for Clear Lake shoreline inventories of Arundo donax. A chipper will be made available for the treatment of Arundo canes.

Project Management

Project management costs were either figured into the estimated hours by task or figured separately as a project administration component. The project administration component considers that time which is used for overall grant related administration such as the processing of invoices for payment, quarterly reports and project specific questions. Project management tasks such as inspection of work, processing of subcontractor agreements and invoices, giving presentations and travell are estimated into each task seperately.

Other Direct Costs

None.

Included in the total hourly rate.

Indirect Costs
Attachment D: Budget and Budget Justification. Subcontractor: Grey Lodge, Level One, Task 12, Years 1 to 3 Budget Justification

All applicants must complete this form for their proposals. <u>Failure to answer these</u> questions will result in the application not being considered for funding.

Budget Form Instructions

Direct Labor Hours. Provide estimated hours proposed for each individual.

Provided on the Budget Plan under"Direct Labor Costs" as an <u>In-Kind</u> Contribution.

Salary. Provide estimated rate of compensation proposed for each individual.

Provided on the Budget Plan under "Direct Salary and benefits".

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

We are not seeking Benefit support under this grant. Provided on the Budget Plan as <u>In-kind</u> contribution.

Travel. Provide purpose and estimate costs for all non-local travel.

N/A, standard County vehicle mileage cost: \$0.35/ mile

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

Office supplies: \$50.00/ year, Computer supplies \$50.00/ year, Field supplies: \$50.00/year.

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate. Provided on the Budget Plan under "Service Contracts". Provided on the Budget Plan under "Direct Salary and benefits".

Mapping Engineer for 300 hours over 3 years @ \$13.44/ hour

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of

equipment is proposed, list parts and materials required for each, and show costs separately from the other items. **None Required**

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentations, response to project specific questions and necessary costs directly associated with specific project oversight. **Provided on the Budget Plan under: "Direct Salary and benefits".**

Under: Administration, Miscellaneous/ Other Direct Costs: Public Education Program.

Other Direct Costs. Provide any other direct costs not already covered. Standard County vehicle mileage cost: \$0.35/ mile. (Es t. 250 miles/ year.)

Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs. *[CORRECTION: If overhead costs are different for State and Federal funds, note the different overhead rates and corresponding total requested funds on Form I - Project Information, Question 17a. On Form VI - Budget Summary, fill out one detailed budget for each year of requested funds, indicating on the form whether you are presenting the indirect costs based on the Federal overhead rate or State overhead rate. Our assumption is that line items other than indirect costs will remain the same whether funds come from State or Federal sources. If this assumption is not true for your budget, provide an explanation on the Budget Justification form.] Agencies should include any internal costs associated with the management of project funds.*