COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, SUITE 400, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
ALVIN JAMES, DIRECTOR

June 7,2002

AGENDA: June 18,2002

Board of Supervisors
County of Santa Cruz
701 Ocean Street
Santa Cruz, CA 95060

APPROVE ALLOCATIONS OF FUNDS AS RECOMMENDED BY THE FISH AND GAME ADVISORY COMMISSION

Members of the Board:

As your Board is aware, there is a special purpose fund within the Fish and Game Advisory Commission Budget Unit, which enables contributions to other agencies or entities for various fish and game enhancement projects: This fiscal year the Fish and Game Commission recommends allocations to three entities, including $5,000 to the Monterey Bay Salmon and Trout Project (MBSTP), $1,000 to CalTIP, and $1,000 to the San Andreas Land Conservancy. The Commission also recommends allocating $1,200 to the County of Santa Cruz staff to contract for professional services from fishery biologists. The fishery biologists will assist staff on the development of a salmonid distribution map.

$5,000 Allocation to Monterey Bay Salmon and Trout Proiect

The Fish and Game Advisory Commission (Commission) recommends funding in the amount of $5,000 to the Monterey Bay Salmon and Trout Project (MBSTP). The request is included as Attachment 1. This funding was considered at the February 7,2002, March 7,2002 and the June 6,2002 meetings, and is a complete funding of the MBSTP request. This allocation will be used to purchase medicine and fish food.

MBSTP plans to spawn and raise offspring from 16 recently trapped adult Coho Salmon and from the 23 others present at their hatchery. In addition, they will be taking over 30 adult Steelhead Trout for spawning from Scott Creek and the San Lorenzo River. The young fish stock spawned from these adults will need to be held for almost a year before releasing them back into local streams.

$1,000 Allocation to CalTIP

The Commission recommends allocation of $1,000 to CalTIP to continue support for securing the future for wildlife/habitat and the sportsperson alike. The request is included as Attachment

2. This funding was considered at the February 7,2002, March 7,2002 and the June 6,2002 meetings, and is a complete funding of the CalTIP request. This allocation will typically be used in both a reward program and in an educational outreach program. The request letter contains a brief overview of what the CalTIP Citizens Review Board did with money it received in 2001.

$1,000 Allocation to the San Andreas Land Conservancy

The Commission recommends allocation of $1,000 to the San Andreas Land Conservancy for Kermit: A technique to reduce introduced exotic bullfrog populations for the protection of and restoration of native species. The request is included as Attachment 3. This funding was considered at the February 7,2002, March 7,2002 and the June 6,2002 meetings, and is a partial funding for the original $5,000 request. Kermit is a technique using auditory and visual mating cues. This depredation technique will be applied by San Andreas Land Conservancy, working with private landowners, other conservation organizations and government agencies to watersheds infested with bullfrogs, an introduced exotic specie.

$1,200 Allocation towards the Development of a Salmonid Distribution Map

The Commission recommends allocation of $1,200 for professional services associated with the development of salmonid distribution map. The request from county staff is included as Attachment 4. This funding was considered at the February 7,2002, March 7,2002 and the June 6, 2002 meetings, and is a complete funding of the request. The amount requested will be used to pay a fishery biologist and a fishery ecologist for their knowledge and time contributed to this project. The Commission has recommended allocation for these professional services, however, a contract has not yet been executed so there is no recommendation to disburse these funds this fiscal year.

It is therefore RECOMMENDED that your Board:

1) Approve the allocations and request the Auditor-Controller disburse the funds to the Monterey Bay Salmon and Trout Project, CalTIP, and to the San Andreas Land Conservancy; and

2) Approve the allocation for professional services associated with development of a Salmonid Distribution Map and direct staff to contract for these services in fiscal year 2002-03.

Sincerely,

ALVIN D. JAMES
Planning Director

RECOMMENDED

SUSAN **A.** MAURIELLO
County Administrative Officer

Blc/WRM02-04

Attachments: 1) Monterey Bay Salmon and Trout Project Request for Funds
2) CAlTIP Request for Funds
3) San Andreas Land Conservancy Request for Funds
4) Staff Request for Funds for Professional Services

MONTEREY BAY SALMON & TROUT PROJECT WWW.MBSTP.ORG **MBSTP@.AOL.COM**

12/27/01

SANTA CRUZ FISH & GAME ADVISORY COMMISSION
ATTN: KRISTEN SCHROEDER
701 OCEAN ST. RM 400
SANTA CRUZ, CA 95060

REFERENCE: FISCAL YEAR 2002 FUNDING REQUEST FOR $5,000.00:

Dear Ms. Schroeder:

The Monterey Bay Salmon & Trout Project, request financial assistance for the fiscal year 2002 in the sum of $5,000.00. I am submitting expense receipts for medicine and fish food for this current fiscal year 2001. This includes fish we are currently feeding & for expenses for fish food and medicine for fish we have already released in 2001 either into our local streams or directly into the Monterey Bay.

These expenses will be higher in 2002 because we have currently trapped 16 adult Coho Salmon and we have 23 captive brood stock Coho Salmon at the hatchery as well. We will spawn and raise their offspring for a year. We intend to take as many as 60 adult Coho Salmon not including our captive brood stock program. In addition, we will be taking over 30 adult Steelhead Trout for spawning from Scott Creek and the San Lorenzo River. We will also hold these fry for almost a year before we release them back into our local streams. We have not spawned any Coho Salmon in the last two years due to poor stream water conditions in December & January and poor ocean conditions over the last five years.

With this years early rain, which is the best we have seen in ten years, we are finally making true progress in the restoration of many of our local streams with Coho Salmon & Steelhead Trout. If you have any questions, please contact me at 831-688-4257 at your earliest convenience. Again, thank you for your consideration.

Sincerely,

Larry Wolf
Director

To: Santa Cruz County Fish and Game Commission.
From: John Robinson, CalTIP Coordinator.
Ref: 2002 Grant funding request for CalTIP.
Date: 1/27/02

The CalTIP program would like to be considered as a grant applicant to the Santa Cruz County Fish & Game Advisory Commission in the year 2002. The amount of funding requested would be $1,000. The support of this Commission and many others like it have enabled the CalTIP program to continue securing the future for wildlife/habitat and the sports person alike. We would like to thank you again for your generous support in the past and look forward to working in Santa Cruz County and another successful year of serving the public and the State of California.

The following is a brief overview of what the CalTIP Citizens Review Board did with the money it received in 2001. The money that CalTIP receives goes both to the reward program and the educational outreach program determined by the Board. The annual CalTIP year end report is anticipated to be completed at the end of February. To request a copy of this simply let me know.

1. The Boards number one project was the CalTIP dispenser boxes. These are counter-top displays that are designed to hold the CalTIP brochures and round decals. The Board ordered and assembled 3,000 of these. To date, 1,800 have been shipped to license agents through the state. There are about 700 agents who still need the box, they will receive them in January.

The total cost of this project is about $40,000 (This figure includes the cost of the box and the decals/brochures that go inside and the shipping charges) The Board funded about half of this project, the DGF covered the rest.

2. The video was a priority in 2001. The board committed to this by agreeing to pay some of the video duplication costs. There contribution to the video project will probably be between $2,000-$4,000.

3. Although this does not affect Santa Cruz County, the Board funded a PSA/ad project in Shasta County in the amount of $1,000. They did this because we noted a market drop off in calls coming in from that region. Shasta County is normally very active, we felt we needed to remind the public of the existence of the CalTIP resource.

4. The last CalTIP billboards went up statewide in the fall of 2001. This ended a three year contract we had. The total cost of the billboard campaign was approximately $20,000.

5. The CalTIP Board met three times in 2001. They reviewed 16 cases and paid out $3,400 in rewards.

As mentioned the new CalTIP video is now out and available. I would be happy to be put on the Commissions next available meeting agenda and show this video (I highly recommend it). It is about 40 min in length and requires a tv and vcr, or I can send a copy of it for your own personal use.

Sincerely,

John Robinson/CalTIP
182 Compass Ct
Boulder Creek, Ca 95006 (831) 338-2313

San Andreas Land Conservancy

0310

David S. Kossack, Ph.D.
P. O. Box. 268
Davenport, CA 95017

Tuesday, January 29, 2002
(831) 427-3733
dkossack@igc.org

Gary Lease, Chair
Fish and Game Advisory Commission
County of Santa Cruz
701 Ocean Street
Santa Cruz, CA 95060

Dear Chairman Lease and Commissioners:

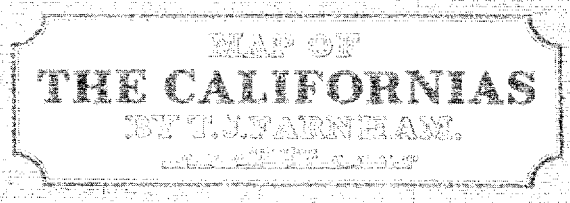
San Andreas Land Conservancy would like to request $5,000.00 from the Santa Cruz County Fish and Game Commission for Kermit: A technique to reduce introduced exotic bullfrog (*Rana catesbieana)* populations using auditory and visual mating cues for the protection and restoration of native species. Attached is a copy of the Kermit project description. Funds requested from the Commission would be part of matching funds ($20,000.00 total) for the implementation of the Kermit demonstration project.

I realize that this is rather short notice but we are very interested in getting this project funded as soon as possible so that we can acquire and assemble materials before the start of the bullfrog mating season (March - July). Clearly the severe impacts inflicted by bullfrogs on native species, including salmon and steelhead, increases with every year bullfrog populations increase in number and in range. I presented this proposal to Peter Moyle at U. C. Davis. He liked the proposal because it took advantage of behavioral cues to attract the bullfrogs into the trap. He also thought that we need to try Kermit because the potential benefits of the project were very high.

We feel that Kermit will be a very effective mechanism to address introduced exotic bullfrogs on a watershed to landscape level. We also feel that the Kermit strategy can be effective reducing the population and range of other introduced exotic species including Cane toads (*Bufo marinas*)! We hope that the Fish and Game Advisory Commission will recognize this project as an important opportunity to affect the protection and restoration of native habitats in Santa Cruz County by funding our request. I look forward to attending the Commission's February 7th meeting to discuss this important, and critically timely, project.

Respectfully

David Kossack



San Andreas Land Conservancy

David S. Kossack, Ph. D.
P. O. Box 268
Davenport, CA 95017

Thursday, November 15,2001
(831) 427-3733
dkossack@igc.org

San Andreas Land Conservancy is a Non-Profit corporation incorporated in the State of California for the protection and restoration of native habitats. We are recognized by the Internal Revenue Service as a 501c(3) tax-exempt organization. San Andreas Land Conservancy has been concerned with the ecologies of western North America since 1995. In addition to the present proposal we are interested in the effects of cumulative impacts on native habitats. We are using airborne remote sensing images to quantify type conversion and age class change in the coastal watersheds of California. In June 2000, NASA/JPL acquired high altitude Airborne Visible and Infra-Red Imaging Spectrometer(AVIRIS) flightlines of the Santa Cruz Mountains (f000601t01r01- r04) for our program: (http://aviris.jpl.nasa.gov/cgi-bin/flights_00.cgi?step=view_flightlog&flight_id=f000601t01).

KERMIT

A technique to reduce introduced exotic bullfrog populations using auditory and visual mating cues for the protection and restoration of native species.

Executive Summary

Kermit is a technique to reduce introduced exotic bullfrog populations using auditory and visual mating cues for the protection and restoration of native species. The present project will bring together several published observations of bullfrog mating behavior into a common application to demonstrate the ability of synthetic species specific cues to lure mating bullfrogs into a trap. We will use one or more bullfrog infested ponds within the introduced range of bullfrogs to demonstrate the Kermit concept. The operational Kermit bullfrog depredation technique will be applied by San Andreas Land Conservancy, working with private land owners, other conservation organizations and government agencies, to infested watersheds across the introduced range of these amphibians to protect and restore native habitats. The Kermit concept should be applicable to other introduced herptile species, including cane toads (*Bufo marinus*), Cuban treefrog (*Osteopilus septentrionalis*), and various introduced 'poison arrow' frogs (e.g., poison-dart frog *Dendrobates auratus*) that use auditory and visual mating cues.

Objectives

Among the most heinous of impacts to native habitats is the spread of introduced exotic plants and animals. In the present case the introduction of exotic bullfrogs (*Rana catesbieana*) has been identified as significant factor contributing to the listing of the native California red-legged frog (*Rana aurora draytonii*) as Threatened under the Federal Endangered Species Act. In particular, several researchers in California have noted the decline and eventual disappearance of California red-legged frogs once bullfrogs become established at the same site'. Bullfrogs have been repeatedly recognized significant factor contributing to the demise of other Threatened and Endangered aquatic species under the Federal and State Endangered Species Acts including such diverse species as the Southwestern Arroyo toad (*Bufo microscaphus californicus*), Giant garter snake (*Thamnophis gigas*), Desert Pupfish (*Cyprinodon macularius*) and California tiger salamander (*Ambystoma californiense*). We feel that it is very reasonable to assume that bullfrogs are eating young Coho salmon and steelhead before they migrate to the Pacific Ocean.

Bullfrogs have had significant impact on all native aquatic species in California. A native of eastern North America, bullfrogs were introduced into California at the end of the 19'' century to supplement waning native frog harvests intended for human consumption. Bullfrogs continue to spread through California colonizing locations with permanent sources of water. Bullfrogs have also been introduced through out the world including Europe, South America and Asia. These frogs impact native amphibian populations through direct predation, larval competition' and the influence of chemical stressors[3]. Other native species that are impacted by bullfrogs at our study sites include Pacific pond turtles (*Clemmys marmorata*) and the nestlings of migratory birds. Efforts to eradicate bullfrogs have included gigging, temporary draining of

enough not to scare away the same males from entering a trap in response to vocalizations and/or a decoy. Territorial Kermit will be a 'small fish in a small pond'.

2. To elicit a female choice, Kermit assumes that the fitness of a male frog is a function of its size: Not only does a large male have the information necessary to live to a large size but these males also have the ability to acquire and defend priority territories that will allow high egg survival. Kermit also assumes that a males size/fitness is part of the information broadcast in a male's mating call. Kermit will assume the chorusing call of a large male, and the position a large male would assume in a pond, to attract as many females as possible through its 'mating season'.

These two strategies are likely to be very efficient in capturing bullfrogs because they evoke stereotypic responses. In addition to removing adult bullfrogs from the habitats of native amphibians, Kermit has the advantage of disrupting the reproduce success of those bullfrogs remaining after a treatment. In the case of females they are captured before they oviposit. At 10,000 to 20,000 eggs per female bullfrog, targeting Kermit towards female capture a will have a long term, positive (for native amphibians) influence on bullfrog populations. In the case of male bullfrogs, removing territorial adults should reduce overall fitness in the bullfrog population. While non-territorial males are recognized as potential mates, removing territorial males will select for smaller size and lower reproductive success. Removing territorial males would also make Kermit more attractive to reproductively mature females. These are all features that would reduce pressures on native fish and wildlife.

Method and Materials

The development of the Kermit pilot project consists of 3 phases:

1. Initial field recordings of male territorial and chorusing calls.

   Bullfrog recordings will be made at local (Santa Cruz County, CA) ponds known to contain bullfrogs. Recordings will be made of male territorial calls, mating calls and any vocalizations made by females bullfrogs. Calls of native amphibians will be recorded when detected. These will be used as reference material.

   - Recordings will use parabolic reflectors and minidisk digital recorders.

2. Field recordings will be manipulated with sound analysis computer software. We are currently working with three sound analysis packages: Syrinx (a digitizing, analyzing & editing program); Praat (a speech analysis, synthesis, and manipulation package); and J. Schwartz's Sound Synthesis program[7] on our PC and Sun Solaris workstation. Analysis will include:

   - Test for presence of native amphibian calls in the background of bullfrog recordings.
   - Identification of sonogram features characteristic of bullfrog calls.
   - Identification of sonogram features that will affect bullfrog responses in lab and field tests.
   - Removal of background and/or construction of synthetic calls; lab and field testing.

3. Development of Playback/Capture Device(s): The Kermit playback/capture device (figure 1) will be a modification of a floating open top turtle trap. Modifications will include a closed top forming a platform for the playback device; funnel entrances on each side to accommodate bullfrog access; additional floatation to position the waterline across the center of the entrances and a 'Nitex' net lining of a mesh to prevent bullfrog eggs from escaping in the environment if a mating event occurs inside the trap. While the capture device may be unexpectedly large (– 1 meter square), the open pond and stream conditions, which bullfrogs prefer, facilitates the use of this type of device'. Bullfrog playback calls will be broad cast using either a minidisk player device or NVRAM/amplifier

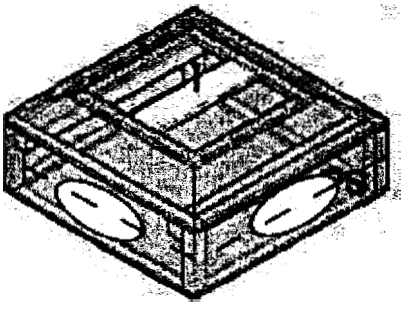


Figure 1. Kermit capture device.
Floats in corners keep trap afloat.
Funnel entrances on sides allow entry.
Platform on top holds playback device.
Dashed lines represent water line.

Kermit Budget

Direct Costs		
Materials		
Hardware:		
Recording:		
Sony MZ-R70DPC, MicroDisk Recorder with Digital PC Interface	**350.00**	
Telinga microphone and parabolic reflector	1,200.00	
PRO **5B,** Accumulator handle balanced inputs		
Stereo DATmic		
1 mm parabolic dish		
Windshield covering the dish (Rycote)		
Transport soft-bag for rolled up dish		
Tripod "quick-mount" with **both** 1/4 and **3/8** inch mounts		
Headphone amplifier		
Total		1550.00
Playback		
Sony **MZ-R37SP,** Portable MD Player	250.00	
Waterproof speakers	100.00	
Battery pack	25.00	
Water proof case	125.00	
Total		500.00
Capture Devise:		
Materials		
(cages, various entries designs, latex **for** frog molds, floatation, mounting)		
Total		1000.00
Software (These applications operate on San Andreas Land Conservancy's Sun Solaris workstations and PCs)		
Syrinx, a sonogram digitizing, analyzing & editing program	Provided by author	
Praat, a speech analysis, synthesis, and manipulation package	Provided by author	
J. Schwartz's Sound Synthesis program'	Provided by author	
Total, materials		$3050.00
Labor (salaries, wages, and benefits)		12,000.00
Travel		1,000.00
Total, Direct Costs		$16,050.00
Indirect costs (overhead @ 25%)		$4,000.00
Kermit Pilot Project Total:		**$20,000.00**

February 7,2002

Dear Commissioners,

This is a request for $1,200 to fund professional services to create a salmonid distribution map for the County of Santa Cruz.

This project will create a map showing the distribution of steelhead and coho salmon throughout the County of Santa Cruz. This proposed project will be a cooperative project between the County, California Dept of Fish and Game, and local fishery biologists. In addition, the National Marine Fisheries Services is very interested in this information for recovery planning.

Within the County, there is a clear need in both Planning and Public Works to know which streams support steelhead and coho salmon for project planning and mitigation requirements. California Dept of Fish and Game is very interested in converting data from stream surveys into a GIS format, especially since the data will reside with the County of Santa Cruz. Within the watershed community, this project could be used for restoration planning, especially for identifying key stream reaches and passage barrier projects. In addition, this map would be available for general interest.

Much of the necessary information exists in CDFG stream surveys and existing reports, but the experience of local fishery biologists (Jennifer Nelson, Patricia Anderson, Don Alley and Dr. Jerry Smith) will be critical to completing the map. This project will record this "institutional memory" for the future. Equally as important, this project will identify areas where data is missing.

The Planning Department will provide the majority of the funding for both GIS services and project management, California Dept of Fish and Game will provide staff time and resources to the project. The amount requested for professional services, $1,200, will be used to pay Don Alley, fishery biologist, and Dr. Jerry Smith, fishery ecologist, for their knowledge and time contribution to this project.

Proposed Project budget

		Amount
GIS Services	county of Santa Cruz	$1,620
Project management	County of Santa Cruz	$1,872
CDFG fishery biologist	CDFG	Approx. $936
Fishery Biologists professional services	Requested from F & G Commission	$1,200
	Total estimated budget	**$5,628**

Thank you for your consideration,

Kristen Schroeder
County of Santa Cruz Fishery Resource Planner