January 1989

# THE SOCIETY FOR
# THE CONSERVATION OF BIGHORN SHEEP

# THE SHEEPHERDER

**SOCIETY FOR THE CONSERVATION OF BIGHORN SHEEP**

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The opinions expressed in this magazine are not necessarily the views or opinions of the Board of Directors.

Eat, Drink and be Merry

**ANNUAL BANQUET A SUCCESS**

By George Taylorson

It was a grand affair. They came from all directions to attend the annual Bighorn Sheep Waterhole count (annual banquet). Over 100 people sat down to an excellent filet mignon dinner at T & J's restaurant.

The banquet had as its master of ceremonies, Dick Conti who, with his grace and charm, led everyone through the evening's events. The Panorama Sportsmen's Club recognized a number of people for their outstanding contributions to conservation. Those recognized were Ron and Shirley Vickrey, Lelani Park of Department of Fish and Game, Marvin Woods, and Les Coombes of the DFG.

The Sheep Society then made their presentations for outstanding conservation services to Assemblywoman Doris Allen, Marion Henry and Tom Jackson, both game wardens.

The speaker of the evening was Assemblywoman Doris Allen who sponsored and helped pass assembly bill AB 3156, the hunter harassment bill recently signed by the Governor.

Assemblywoman Allen spoke on the battle she had in getting this bill passed. She complimented the Bighorn Sheep Society on their help along with several other organizations. She was very critical of such groups as the Foundation for North American Wild Sheep, the National Rifle Association, the California Rifle and Pistol Association, along with the ACLU. She pointed out that these groups did absolutely nothing to assist in the passage of

Everyone Had A Good Time

the bill and if anything found their lack of cooperation to be a hindrance.

It should be noted that this legislation will now make it a crime to harass anyone in the State of California who wants to enjoy his right to hunt. It is a shame that the above mentioned organizations would not support this kind of legislation.

The evening was concluded with a raffle of gifts. A fun and enjoyable evening was had by all.

**HEMET MEN FINED $2,000 FOR "SNAKING" WITHOUT A LICENSE**

Two Hemet men have been ordered to pay a total of $2,020 in penalties for the illegal capture of a shovelnosed snake in Riverside County.

Robert H. Gamble, 24, and Mark A. Morris, 20, were arrested May 13 by Fish and Game Lt. Al Stegall while on a routine late-night patrol of a popular reptile hunting area.

Stegall said the men pleaded guilty in San Jacinto Municipal Court, Banning, on July 7, to charges of collecting reptiles without possession of a valid sport fishing license.

State law requires that collectors of snakes, lizards and other reptiles and amphibians, hold a current California sport fishing license and obey all rules that govern the activity.

Judge Robert T. Peterson levied a $220 fine to be paid by Morris, a stiff penalty to be sure, for half ownership of an ill-gotten snake. However, after considering recommendations provided by Lt. Stegall, Judge Peterson ordered Gamble to pay a considerable more substantial fine of $1,800.

Stegall said while he was talking with the two men May 13, he remembered Gamble from a previous incident that occurred almost one year earlier to the day, May 14. Stegall said on that date in 1987, Gamble was arrested by Fish and Game wardens and charged with illegal out of state transportation and sale of 26 snakes and lizards, a violation of the Federal Lacy Act.

Gamble subsequently pleaded guilty to the 1987 charges and was placed on three years probation.

Judge Peterson agreed with Stegall that Gamble should receive near maximum cash penalty for the latest incident.

Reptile gathering without a fishing license, a misdemeanor violation of the California Code of Regulations, Title 14, Section 700, is punishible by a maximum $2,000 fine and one year in county jail.

Gamble and Morris were also placed on three years probation and prohibited from taking part in reptile collection activities during the period.

## TAMARISK REMOVAL UPDATE

By David Talley

Last year at the Sheep Camp Guzzler project many of the volunteers who did not work on the guzzler engaged in cutting and spraying tamarisk in the drainage. This project appears to have already affected the water availability in the wash.

During a sheep census in July, sheep were observed drinking from water which had accumulated in the wash. This water was not available prior to the removal of the tamarisk. Hopefully this emphasis on removal of tamarisk will continue in future desert projects, as the result of this project appears to be very worthwhile.

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APPLICATION FOR MEMBERSHIP
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The kinds of memberships available are:

| | |
|---|---|
| ____Annual | $25.00 |
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(may be paid in four equal payments)
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All donations are tax deductible.

Also included is my contribution of $_____ for Desert Waterhole Improvement

Enclosed you will find my check or money order for $_____

Workers On A Recent Project

**1989 WATERHOLE PROJECTS**
**(Mark Your Calendar Now)**

By Les Coombes - DFG

Well, here we go with another year of volunteer projects in the desert to bring water to wildlife. First, we would like to thank you for your participation in the 1988 "Waterhole Projects."

This year we have a total of eight projects, with the emphasis being on making major repairs at five guzzlers, install one cattle fence, two censuses, develop one spring, and our yearly visit to Anza Borrego State Park to lend a hand. As usual, you must call the Department of Fish and Game in Long Beach (213) 590-5158) and ask for Leilani Park. Tell her which projects you are interested in and about two weeks prior to the project you will receive a letter and map for that project.

We will again be depending on you to make this a successful year as we have a lot to do in the desert for the critters.

Here is a list of the 1989 waterhole projects:

| | | |
|---|---|---|
| 1. | January 21/22 | Old Woman Mountains BGG repairs and cattle fence |
| 2. | February 25/26 | Clipper Mountain BGG rebuild |

| | | |
|---|---|---|
| 3. | March 11/12 (with alternate 18/19) | San Gabriel Sheep Census |
| 4. | April 8/9 | Cady Mountain BGG rebuild |
| 5. | May 6/7 | Nopah Mountain - 2 BGG rebuild |
| 6. | June 3/4 | Spring Development (location to be announced) |
| 7. | July 1/2/3/4 | Census (location to be announced) |
| 8. | October 7/8 | Anza Borrego State Park year project |

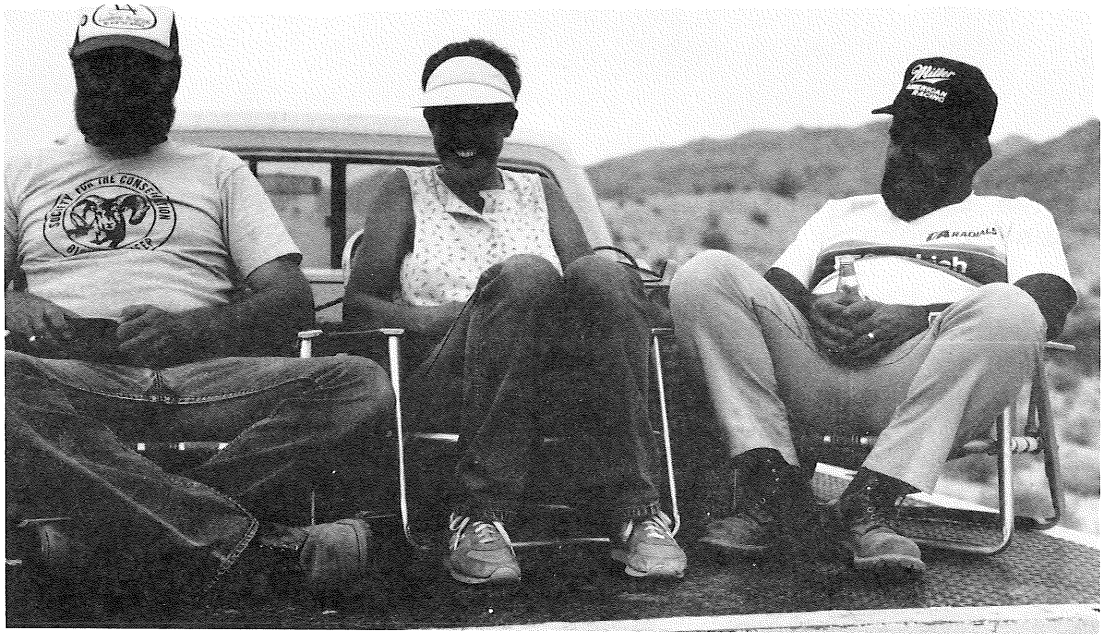
Here is a brief history of the volunteer program that you are a part of when you attend a project. The official name of the program is the "Volunteer Desert Water and Wildlife Survey." This is a Department of Fish and Game program that was formed in 1969 at the urging of sportsmen and conservation groups. The purpose of the program is to supply the DFG with volunteer labor to implement the recommendations of Dick Weaver, of the DFG, who did a survey in the late 1960's on the bighorn sheep populations and water sources. Some nineteen years later the program is still going strong.

Over the years, the Society for the Conservation of Bighorn Sheep has been a major partner in assisting the Department in accomplishing our task to provide water for bighorn sheep and other wildlife. The Society has provided volunteer leaders and developed the attached volunteer guidelines for our projects. In 1989 the Society will continue to offer materials and people to accomplish our projects.

Another major partner in this effort is the U.S. Bureau of Land Management. Most bighorn habitat is on Bureau of Land Management lands. The Bureau provides materials and biologists to assist in maintaining healthy bighorn sheep populations.

With the team of volunteers, Society for the Conservation of Bighorn Sheep, Bureau of Land Management and the Department of Fish and Game, 1989 should be a good year for the bighorn and other desert wildlife.

Hope to see you in the desert in 1989.



These Folks Came Prepared

**VOLUNTEERS LEND ME YOUR EARS...**

By John Doll

You should come with enough fresh water to cover your needs for Friday, Saturday and Sunday.

Those of you who have never been on a Water Hole project should know that the roads leading to most projects are marked by the Department of Fish and Game with arrows painted on paper plates or on small wooden signs attached to stakes two or three feet high. These plates or signs usually have the initials DFG along with the arrow and are placed wherever the road turns. These signs could be placed miles apart so, you and your co-pilot should keep a sharp eye out.

Those of you arriving on Friday night and who did not eat along the way should bring something easy and quick to eat. We usually turn in early because Saturday is a BIG day.

Saturday morning we are usually awakened early, (around 6:00). Breakfast should be eaten quickly. Your back pack should contain your lunch and also the following items:

| | |
|---|---|
| Pair of Gloves | Compass and Flashlight |
| Small First Aid Kit | Whistle |
| Toilet Paper | A Canteen of water for each member of your party |
| Matches | Hat or Scarf |
| Sun Glasses | Chap Stick |

The compass and whistle are just a precaution. We are usually trucked up and back together as a group.

You may carry a small ice chest if you'd like. But, remember you have to carry it up and down the desert trail from 1/2 mile to 3 miles or more.

You'll need to bring your dinner for Saturday night. We usually make a community bon-fire and sometimes we have sing-alongs. (Please bring a supply of firewood for your camp and also for the community bon-fire.)

The goal is to finish the waterhole project between 3:30 and 4:30 on Saturday. If the project is not completed then the Department of Fish and Game may ask for a handful of volunteers to return to the site on Sunday. We must say that this rarely happens.

We usually eat breakfast at camp on Sunday morning then everyone pulls out whenever they are ready to head home.

We should always come prepared with comfortable walking shoes or boots. Tennis shoes are okay. Thongs or sandals are NOT OKAY. Dress with layers of clothes that may be peeled off or put on as the weather changes during the day. Shorts if you'd like under your jeans. A tank top or tee type shirt under your long-sleeved shirt. Always bring a jacket along. The desert is very unpredictable. When the winds come up it can get quite "chilly" even in the summer months.

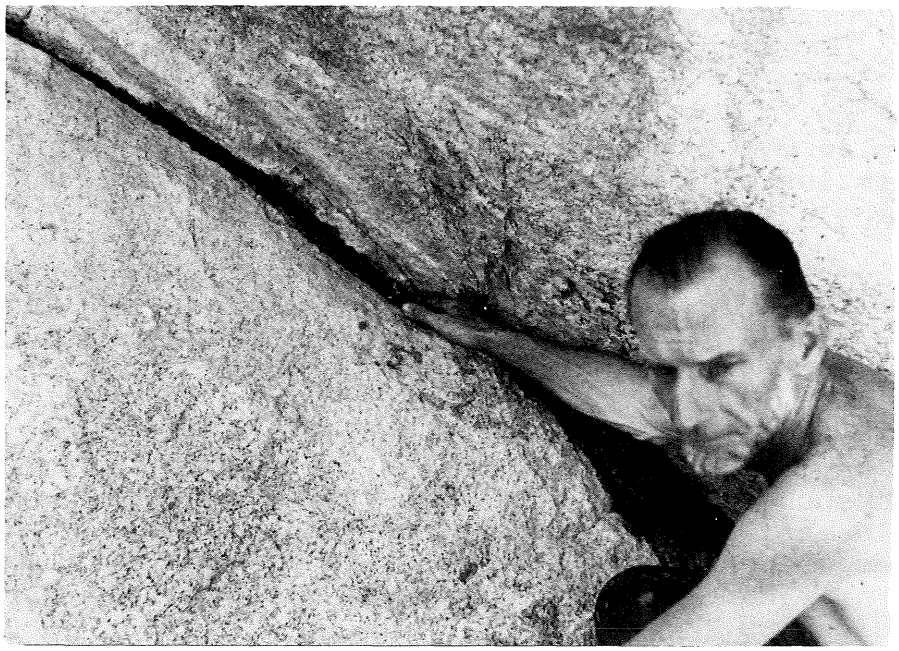
Remember that you should always stay on the trail as marked for us by the Department of Fish and Game.

If you should decide to take a walk away from the group be sure to notify one of the DFG biologists in charge where you are going and how long you intend to be gone!

**Some important rules:**

Do not fire any guns around the camp site or around the waterhole project.
Please do not ignite any firecrackers or bottle rockets around the camp.
It is okay to ride a motorcycle to the camp, but it is NOT OKAY to ride off the road, to the project or through the open desert, or back and forth through the camp.
Watch your children. DO NOT let them throw rocks in the camp or at the project.

By following these few suggestions, everyone should have a good time.



Bob Campbell Discovers A New Seep

**A NEW ADDITION: CAMPBELL'S SEEP**

By Scott Yoo

John Doll and Bob Campbell approached me about helping them develop a seep that had been discovered in the Granite Mountains.

The work party consisted of John Doll, Bob Campbell, Jef Yeager and me. We left Camp Cady on the morning of August 27, 1988 and drove to the vicinity of Snake Spring adjacent to Kelbaker Road.

The mountains consisted of an array of coarse grained, rounded boulders ranging from wheel-barrow size to that of a three bedroom house. The boulders were stacked in such a way as to provide innumerable overhangs, squeeze-openings, caves, cathedrals, ledges, and passages. As one climbs the face of the mountain and peers inside the outermost jumble of boulders, many narrow, sandy pockets and channels can be seen filling the cracks and contact surfaces of the deeper rocks. This labyrinth provides natural catchments for rain and allows some of the water to be detained long enough to percolate into the deep recesses of the mountain, where it may be given up later in the form of a slow trickle.

Such was the case for Bob's seep. It emerged from a massive boulder at the base of the mountain and dribbled in a sheet down the rock face to a diagonal fracture, finally dripping into a plastic dish pan placed on an earlier visit. The pan was full when we arrived, promising success for the project John and Bob had envisioned.

The plan called for the use of the COBRA rock drill to bore out an existing hollow below the seep, then enlarge it by constructing a cement lip.

Murphy's Law (if it can go wrong, it will), plagued the day with intermittent rain, thunder, and lightning. We were repeatedly forced to take refuge under a large overhang adjacent to the work area.

During one of the longer showers I thought of Early Man and how bored he must have become while waiting out storms in cramped conditions such as ours. I thought that circumstances such as these could easily have triggered the restlessness which often accompanies creativity. It was easy to imagine that, in his boredom, Early Man began to experiment with drawing on the walls of his enclosures.

To return to the project: After some preliminary discussion on placement, water from the seep was diverted and we all took turns on the COBRA. Several large chunks were removed from the parent rock to form the heart of the basin. A number of smaller holes were drilled around the perimeter of the basin to accept short pieces of 3/4" pipe. The pipes, when connected with the horizontal sections of rebar, and tied together with hardware cloth and wire, provided structural support for the cement.

At length we finished everything except for the cement work, hesitating because of the threat of more rain. The cliff swallows began to fly in the early afternoon, heralding the end of the storm, so we opted to continue.

Sand from the wash was mixed with cement and pressed into the framework. We used a plastic water bottle with a bubble of air in it as a level to build up the lip to the desired elevation.

During the late afternoon Britt Wilson and his brother-in-law, Tony Edwards, arrived (as per earlier arrangement) from their attempt to do work in the Nopahs. They helped us load out the equipment, where we were greeted at the vehicles by Game Warden Tom Jackson. After catching up on each other's news we packed up, bid Tom farewell, and returned to Camp Cady.

In the seep's natural condition, very limited use and access were available due to the extremely low output and its one-cup storage capacity. After hollowing the parent rock and building the lip, storage was increased to roughly 2 to 3 gallons. This improvement ensures that all members of the group could fill up quickly and thus minimize their exposure to predatory danger.

We all shared time on the COBRA but each member of the team provided a specialty that was needed: John acted as advisor and safety steward; Bob was the pipe and rebar cutter; Jef became our

cement mason; and I was the structural assembler. With this kind of teamwork and camaraderie, many kinds of wildlife can now have unlimited use of this newly developed water source.

**NET GUN ADDED TO DFG ARMORY**

Wildlife research in Southern California received a considerable boost recently in the form of a special gun that will contribute significantly to the future of big game management statewide.

Department of Fish and Game wildlife biologists are the proud beneficiaries of a brand new, $3,500 net gun, courtesy of a local hunting organization.

Terry Mansfield, DFG wildlife biologist in Sacramento, said the department is most appreciative of the generous donation. A gift from the San Fernando Valley chapter of the Safari Club, the new addition brings the department complement up to a total of two net guns.

"The gun was barely out of the box and assembled when it was pressed into service for the first time in a bighorn sheep project for ongoing research," Mansfield said.

Rocky Thompson, DFG wildlife biologist in Imperial County, said he took delivery of the gun in June in time for a bighorn sheep survey project in the Old Woman Mountains of San Bernardino County.

"We wanted to net and remove a couple of feral goats in the area. Although we were unsuccessful this time, we will remove them eventually in order to avoid possible disease transmittal to the sheep by the goats," Thompson said.

Nevertheless, Thompson said he test-fired the gun several times while in the field. "It works just fine...sure is a handy tool," the biologist commented.

Fired by a .308 caliber blank cartridge, the new net gun deploys a 15- by 15-foot square, five-inch mesh Nilon net for a distance of approximately 35 feet at ground level, Thompson said.

"We will use it most often from a helicopter, a procedure that allows us to select individual animals and target them for capture," Thompson said.

Biologists prefer to use a net gun for capture operations where practical because fewer animal mortalities and lower capture stress levels occur, compared to other capture methods such as

drive nets and tranquilizer dart guns. Also, when only a few animals are required to be captured, labor costs are considerably lower.

Thompson, an expert in the use of a net gun, has had extensive experience with the tool in the capture of such wildlife as bighorn sheep, antelope and deer where department biologists find a need to collect animals to accomplish various wildlife management goals.

"We are real happy to have a second net gun on board," Thompson said. "It takes considerable pressure off the single gun we have had available thus far."

**CALIFORNIA DEPARTMENT OF FISH AND GAME**
**ANNUAL JOB PROGRESS REPORT**

By Dick Weaver

The Legislature again appropriated $290,000 of Environmental License Plate funds for bighorn work, making it possible to continue the surveys, serology sampling and studies. Three relocation efforts were made, one to augment the Lee Vining Canyon release made in 1986, one to extend the range of bighorn in the White Mountains and one to augment the Eagle Crags 1983 reintroduction.

Helicopter counts were made in 15 mountain ranges by the Department. Two helicopter counts were made by the Bighorn Research Institute in the Santa Rosa Mountains, and a helicopter count of the Dead Mountains was made by the U.S. Bureau of Reclamation. Waterhole counts were made at selected sites by volunteers. Ground counts are made by the contract investigator on selected mountain ranges. Serology and other biological samples were taken from 110 bighorn. Scabies mites were found on three bighorn. All the bighorn in the Warner Mountains died in January, 1988, from a bacterial pneumonia. Lamb mortality investigations are continuing by agreement with the Bighorn Research Institute in the Santa Rosa Mountains, where the population continues to decline.

The current bighorn estimate statewide is 4,661. Nine permittees took nine rams in the first bighorn hunt allowed in California since 1883.

OBJECTIVES:

To compile and analyze data, to update the statewide inventory and to coordinate field activities and graduate studies on bighorn sheep. To coordinate reintroduction efforts and assist in the development of bighorn herd (mountain range) management plans.

PROCEDURE:

The statewide status of bighorn populations was monitored through aerial surveys conducted by the Department and cooperators. Data on the prevalence of disease and other related problems were compiled.

FINDINGS:

A. Hunts

On January 1, 1987, a statutory change regarding bighorn sheep management became effective. The law mandates that management plans be developed for each bighorn population (mountain range), and authorizes hunting of not more than 15 percent of the mature rams in two mountain ranges located in San Bernardino County. The statute will be in effect for five years. Regulations are adopted annually by the Fish and Game Commission consistent with the enabling legislation. The first hunt was conducted in November and December of 1987. Nine permits were issued. Nine rams were taken, ranging in age from 6 to 11 years. Preliminary Boone and Crockett scores ranged from 155 to 168 points. Three of the hunters were harassed by an animal rights group. Approximately $92,000 was generated by the hunt, which goes into a dedicated account to benefit bighorn sheep. The Commission has authorized nine permits for 1988. A report to the Legislature is attached.

B. Counts

Department personnel conducted helicopter surveys of 15 mountain ranges and obtained bighorn blood samples. Three mountain ranges are now surveyed annually by air because they are more intensely managed, including trapping for relocation and/or hunting. Two of these ranges now have enough marked animals to make refined population estimates possible.

Volunteers, under Department direction, made waterhole counts at selected sources in three mountain ranges. Volunteers, under direction of State Park personnel, made waterhole counts in the northern portion of Anza Borrego State Park. The Bighorn Research Institute made semiannual helicopter counts in the Santa Rosa Mountains.

The revised bighorn populations estimates by mountain range are attached. The overall populations is essentially unchanged. Some mountain ranges were revised downward, and others upward, based on updated information. Significant findings are as follows:

1. There has been a continued decline in the populations of Peninsular bighorn. In the Santa Rosa Mountains, the situation is under investigation by the Bighorn Research Institute. A graduate student working in the Carrizo Canyon area of San Diego County has confirmed poor lamb survival and the prevalence of disease in the population.

2. Annual or semiannual counts made in the San Gabriel and Marble mountains and Kelso/Old Dad peaks indicate these areas are sustaining a high density of bighorn and continue to provide animals for translocation.

3. The Turtle Mountains were surveyed again this year, confirming a healthy lamb/ewe ratio. Plans have been made to trap individuals for relocation from this population.

4. Volunteers covering 5 springs in the Avawatz Mountains counted 17 different sheep. The results are significant, because a 7-hour helicopter survey in March of 1987 yielded only 7 bighorn, and a 4-hour flight in June 1986 provided a count if just 12 . this suggests that helicopter flights have missed a significant portion of the population, and reproductive success is good.

5. A 5.8-hour helicopter survey of the Chemehuevi Mountains located only one ewe. This range continues to be one of major concern for the long-term welfare of the bighorn population. An augmentation will be considered. This action appears to have been successful for the Sheephole Mountains, which had a critically low population before augmentations were made.

6. A helicopter survey of the Whipple Mountains confirms that this reintroduction was successful. This range has experienced good lamb production and survival since the introduction was made.

   The Dodd Spring area on Hunter Mountain was investigated because of a reported heavy loss of animals in the area. In 1.8 hours of rotor time, 21 bighorn were observed. There was no evidence of unusual losses. Feral donkey and domestic cattle continue to use the area around the spring.

   An intensive ground survey of the reintroduced Mount Langly herd was made because there were no longer any functioning radio collars and because information on this herd was sketchy. A team spent 17 days searching

the habitat and located a minimum of 37 bighorn, after eliminating possible duplications. Indications are that reproduction and survival have been good in the herd.

C. Studies

The lamb mortality study being conducted for the Department by the Bighorn Research Institute continues in the Santa Rosa Mountains of Riverside County. Sick lambs have been captured within the Anza Borrego State Park in San Diego County, where the same high lamb mortality problem exists. Sick lambs that have recovered and raised to breeding age have been released in the range. Vaccination trials have been conducted with these captive animals, and there is an ongoing field trial with a vaccine for parainfluenza (PI-3). It was delivered to 17 animals from a helicopter via soluble 20-caliber bio-bullets.

1. The contract with the University of California, Los Angeles, to investigate the impacts of cattle grazing on bighorn sheep is continuing. A report has been received; a copy is attached. The thrust of the investigations is to determine the demographic history of bighorn populations with a high exposure to bluetongue (BT) and/or epizootic hemorrhagic disease (EHD) and populations with low titers for these diseases. Cattle commonly carry BT in chronic form, with little influence on their health. However, it is likely that they constitute a long-term disease reservoir for bighorn sheep. Both BT and EHD require a gnat transmission between animals, thus close contact between cattle and bighorn is not necessary.

   The data gathered to date support the hypothesis that bighorn populations with a high exposure to BT/EHD will have a lower density than equivalent populations with low exposure to these diseases. Additional mountain ranges have been added to the study so that more than one comparison of mountain ranges can be made.

2. A graduate student completed a study of bighorn populations in the Carrizo Canyon of San Diego County, and a master's thesis was received. This is the area where recent serology sampling and capture of sick lambs has confirmed an existing disease problem. this area has been the site of trespass cattle use on state park lands and bighorn habitat.

D. During population censuses and relocation projects, as well as collections from hunter-killed bighorn rams, blood samples were taken and processed through several labs to determine the presence or evidence of exposure to diseases of

domestic and wild ruminants. Blood samples were obtained from 110 bighorn. To date, no mountain range has been free of all the viral diseases of concern. These include: Parainfluenza 3 (PI-3); epizootic hemorrhagic disease (EHD); bluetongue (BT); contagious ecthyma (CE); and respiratory syncita (RSV). To date, 119 California, 501 Nelson and 17 Peninsular bighorn (excluding those sampled by the Bighorn Research Institute) blood samples have been taken. Of the mountain ranges sampled to date, 69 percent have titers indicating exposure to BT or EHD, diseases that have a gnat as a vector. Fifty-four percent of ranges indicate exposure to PI-3, a disease spread by direct contact. No exposure to PI-3, BTV or EHD has been detected in the following mountain ranges: Kingstons, Paiute, Clark, San Bernardino, Chuckwalla, Avawatz and that portion of the Death Valley area checked to date, including Panamint, Butte, Tucki Mountain, Tin Mountain, Dry Mountain and the Grapevine Mountains.

E. **Scabies**

A total of three widely separated cases of scabies mite infection were discovered during the past year. One was a four-year-old ram captured October 27, 1987, on Dry Mountain in Inyo County. The second was an eight-year-old ewe captured November 11, 1987, on Panamint Butte in Inyo County. The third animal was a ewe hit by an automobile in the San Bernardino Mountains in San Bernardino County.

These animals had severe aural dermatitis. Skin scrapings were examined at the Department's Wildlife investigations Laboratory; the University of California, Davis Veterinary Medical Teaching Hospital and the U.S. Department of Agriculture Livestock Insects Laboratory in Kerrville, Texas. These samples revealed eggs, live mating pairs, nymphs and adult mange mites Psoroptes ovis. The last reported case of scabies in bighorn sheep in California occurred in the 1870's in the Southern Sierra Nevada Mountains, and was associated with infected domestic sheep.

Severe psorptic scabies has frequently been identified historically in the literature as the cause for bighorn die-offs in the West. A major die-off of bighorn sheep attributed to scabies occurred in New Mexico in the 1970's has been well documented. Scabies-infected bighorn remain a problem in the San Andreas Mountains of New Mexico. Recently, scabies has been discovered and associated with bighorn losses in Idaho (1984) and the Washington/Oregon border (1988).

An epizootic with heavy bighorn mortality is a real possibility. Field personnel have been alerted to look

for symptoms. All bighorn handled are examined closely for evidence of mites in the ears. All animals trapped for relocation are given a prophylactic treatment with ivermectin. Psoroptes ovis is a reportable disease, and is reported to the State Department of Agriculture when found.

F. **Pneumonia**

All the bighorn sheep in the Warner Mountains died during the winter of 1987/88. A diligent helicopter search was made to find bighorn carcasses and surviving animals. Carcasses were lifted out, and necropsies were performed by the Department's Wildlife investigations Laboratory. Tissues were also sent to U.C. Davis Veterinary Medical Teaching Hospital. The organisms most likely to have caused this type of highly lethal and infectious pneumonia, as determined by gross and histologic findings are Pasteurella hemolytica type A and/or Pasteurella multocida. The most likely source of this infection was one stray domestic sheep reported to have been among the bighorn during the outbreak. Feral goats that were several miles from bighorn ewe groups were collected. They were found to carry pathologic Pasteurella spp. bacteria that could have been carried by rams that had been seen in the area. Deer, domestic sheep and cattle of the area were also examined as possible sources, with negative results.

G. **Transplants**

The Lee Vining reintroduction, which was made in March of 1986, was augmented with 11 additional bighorn from the Mount Baxter herd in march of 1988. This included seven adult ewes, one yearling ewe and three rams. The augmentation was necessary, because there were only five ewes of reproductive age in the new herd. The National Park Service is continuing the follow up study, and with augmentation has added an additional year of data gathering to the study plan.

On March 7, 1988, 10 bighorn were relocated within the White Mountains. The release site was within Silver Canyon at a site sometimes frequented by rams. The composition of the group moved was 4 adult ewes, 1 yearling ewe, 1 female lamb, 2 male lambs and 2 yearling rams. Four adult ewes and one yearling ram received radio collars. This action was an attempt to reestablih bighorn use in a part of a mountain range currently not used by bighorn, except for transient rams. We have documented steady increase in the bighorn population in the northern part of the range. The topography limits trapping of this population to the baiting and drop net method when weather and greenup conditions are favorable and bring the animals to a trapable site. Although bait had been put out for four winters, this is the first year that conditions were favorable for trapping.

H. **Status of Transplants**

1. **Whipple Mountains** - 1983, 1984, 1985 - Nelson bighorn: This reintroduction is considered a success. The population is believed to be at least 120 animals. The three releases did not establish three different ewe bands as originally planned.

2. **San Gabriel Mountains** - 1983 - Nelson bighorn: No new information was gathered on this population translocated to vacant habitat within the mountain range.

3. **Eagle Crags** - 1983, 1987 - Nelson bighorn: This reintroduction was augmented in 1987. The total population is unknown, but is believed to be increasing slowly. Follow-up investigation by China Lake Naval Weapons Center personnel is hampered by the heavy use of this range by military operations.

4. **Sheephole Mountains** - 1984, 1985 - Nelson bighorn: This was an augmentation of an extremely small remnant population. It is still difficult to get visual observations on the bighorn in this range from a helicopter. Water hole counts by volunteers have confirmed that a number of unmarked young animals indicate successful reproduction and survival.

5. **San Rafael Peak** - 1985, 1987 - Nelson bighorn: The augmentation of this reintroduced population has been successful. Radio signals are still being monitored by fixed-wing aircraft. The bighorn have developed site attachment to good habitat. The level of predation experienced after the first release is no longer a significant factor.

6. **Silver Canyon** - 1988 - Nelson bighorn (see White Mountains above): The success of this effort is in doubt. Two of the adult ewes exhibited possible capture-related problems when released. They were observed for two days following release, and appeared fine. On May 23, a fixed wing telemetry flight turned up mortality signals for three weeks prior, but had since crossed the range and was low on the east side in the Wyman Canyon drainage. Her collar was retrieved in Pinyon-Juniper deer habitat at 8,000 feet elevation. Evidence clearly indicated that she was killed by a lion based on drag marks, tooth marks in the skull and partial burial of the carcass. The remaining two mortalities were in Silver Canyon and were clearly a lion kill based on tooth marks in the skull and lion dung around the carcass. The third mortality was in the

higher part of sheep habitat in an upper side drainage at 8,400 feet elevation. There was evidence that would suggest lion predation.

The fates of the remaining seven sheep is unknown. The telemetered ram was at the top of Wyman Canyon during the May 23 flight, and on June 16 was reported observed at the Shulman bristlecone grove. A normal signal from the remaining adult ewe was picked up in Silver Canyon. It will be important to assess the status of these remaining sheep this fall in deciding whether augmentation is worthwhile. There is little hope for the population, given at most only three females in it. Silver Canyon is suitable habitat. The problem is probably one of getting ewe numbers high enough that lion predation is balanced by recruitment.

7. **Argus Mountains** - 1986 - Nelson bighorn: No information has been gathered on this release, and no radio collars were placed on these animals. Infrequent sightings are reported to the Department, indicating animals are in the release area. A helicopter survey is planned for November, 1988.

8. **Warner Mountains** - 1980 - California bighorn (see above): This population experienced a complete die-off in January, 1988.

9. **Wheeler Ridge** - 1979, 1980 - California bighorn: Observations on this reintroduced population are few. The indications are that the population continues to increase slowly.

10. **Mount Langly** - 1980, 1982 - California bighorn: An intensive ground survey made in late summer of 1987 resulted in determining a minimum population of 37 animals. All radio collars have ceased to function. Two rams were fitted with radio collars and released in the winter range to help track this population. However, they did not join the reintroduced herd, and returned to the Sawmill Canyon area, where they were captured. The terrain has made this population extremely hard to gather information on without the aid of radio collars. The population has continued to grow slowly and expand its range.

11. **Lee Vining Canyon** - 1986, 1988 - California bighorn: This herd currently has 33 animals, 9 from the 1986 release, 11 from the 1988 release and 13 born in Lee Vining Canyon. The composition is 12 adult ewes, 6 adult rams, 9 yearlings and 6 lambs. In addition, the

group that moved 8 airline miles to Bloody Canyon in the fall of 1986 now number 7 bighorn, 3 ewes, 2 two-year-olds and two lambs.

I. Plans

Legislation passed in 1986 mandates that bighorn management plans be developed for each bighorn herd. Seven plans have been drafted to date. Where bighorn plans exist, they will be updated and include all the specific elements specified in the legislation. Revenue generated from hunting bighorn, as allowed under this legislation, will be used to implement these plans.

The Bureau of Land Management requires habitat management plans prior to the reintroduction of bighorn sheep on public domain lands. The Department is cooperating in the development of these plans.

**ANALYSIS:**

Job objectives are being met. All reintroduced bighorn sheep in California appear at this time to have a good chance of establishing viable herds. Information on bighorn continues to be compiled from cooperating agencies, graduate students, volunteers and the Department.

RECOMMENDATIONS:

Continue to coordinate the bighorn studies and surveys. Develop reintroduction plans to achieve the herd objectives.

**ESTIMATED BIGHORN POPULATIONS**
**BY MOUNTAIN RANGE**

| Mountain Range | Current Estimate | |
|---|---|---|
| MONO COUNTY | | |
| White Mountains | 150 | |
| Subtotal | | 150 |
| INYO AND MONO COUNTIES | | |
| Sierra Nevada Range* | | |
| Langly (reintroduced 1980) | 40 | |
| Williamson | 32 | |
| Baxter | 175 | |
| Wheeler (reintroduced 1987) | 40 | |
| Lee Vining (reintroduced 1986) | 40 | |
| Subtotal | | 327 |

| | | |
|---|---|---|
| INYO COUNTY | | |
| Inyo Mountains | 40 | |
| Last Chance Mountains | 85 | |
| Dry Mountains | | |
| Nopah Range | 100 | |
| Coso Range | 0 | |
| Slate Range | Transient | |
| Nelson Range | 0 | |
| Argus Range (reintroduced 1986) | 25 | |
| Deep Springs | 0 | |
| Subtotal | | 250 |
| Death Valley and Vicinity | | |
| Funeral Mountains | 35 | |
| Black Mountains | 70 | |
| Grapevine Mountains | 50 | |
| Cottonwood Mountains | 105 | |
| Panamint Mountains | 144 | |
| Subtotal | | 404 |
| SAN BERNARDINO COUNTY | | |
| Avawatz Mountains | 35 | |
| Cady Mountains | 50 | |
| Castle Peaks, Hart Mt., Paiute Range | 25 | |
| Chemehuevi Mountains | 20 | |
| Clark Mountains | 150 | |
| Clipper Mountains | 50 | |
| Granite Mountains (near Amboy) | 40 | |
| Hackberry Mountains | 60 | |
| Kelso Mountain/Old Dad Peak | 250 | |
| Kingston Mountains | 150 | |
| Marble Mountains | 180 | |
| New York Mountains | 30 | |
| Old Dad Mountains | 5 | |
| Old Woman Mountains | 70 | |
| Providence Mountains | 50 | |
| Sacramento Mountains | 60 | |
| San Bernardino Mountains | 150 | |
| Sheephole Mountains | 50 | |
| Turtle Mountains | 110 | |
| Woods Mountain | 25 | |
| Dead Mountains | 50 | |
| Newberry | 15 | |
| Whipple Mountains (reintroduced 1983) | 120 | |
| Eagle Crags (reintroduced 1983) | 30 | |
| Bullion Mountains | Transient | |
| Bristol Mountains | Transient | |
| Iron Mountains | Transient | |
| Ivanpah Mountains | Transient | |
| Mescal Range | Transient | |

| | | |
|---|---|---|
| Paiute Mountains (south of 66) | Transient | |
| Owlshead Mountains | Transient | |
| Ship Mountains | Transient | |
| Van Winkle Mountains | Transient | |
| Vontrigger Mountains | Transient | |
| Granite Mountain (Fort Irwin) | 0 | |
| Quail Mountains | 0 | |
| Shadow Mountains (near Baker) | 0 | |
| Stepladder Mountains | 0 | |
| Rodman-Ord Mountain Area | 0 | |
| Subtotal | | 1,775 |
| SAN BERNARDINO AND LOS ANGELES COUNTIES | | |
| San Gabriel Mountain Range | 700 | |
| Subtotal | | 700 |
| RIVERSIDE COUNTY | | |
| Joshua Tree National Monument and Vicinity | | |
| Little San Bernardino Mountains | 100 | |
| Queen Mountain Area | 25 | |
| Eagle Mountains | 45 | |
| Coxcomb Mountains | 15 | |
| Pinto Mountains (east of Queen Mt.) | Transient | |
| Subtotal | | 185 |
| Chuckwalla Mountains | 10 | |
| Granite and Palen Ranges | 15 | |
| Orocopia Mountains and Mecca Hills | 80 | |
| San Jacinto Mountains ** | 60 | |
| Maria Mountains | 0 | |
| Subtotal | | 165 |
| RIVERSIDE AND SAN DIEGO COUNTIES | | |
| Santa Rosa Mountains** | 250 | |
| Subtotal | | 250 |
| SAN DIEGO AND IMPERIAL COUNTIES | | |
| Anza Borrego and Vicinity** | | |
| Pinto/Inkopah Drainage (s. of 1-8) Imperial County) | 20 | |
| Jacumba/Inkopah Mountains | 30 | |
| Vallecito/Pinyon Mountains | 30 | |
| Pinyon Ridge | 30 | |
| San Ysidro Mountains/Coyote Creek | 150 | |
| Sawtooth/Tierra Blanco Mountains | Transient | |
| Coyote Mountains | Transient | |
| Subtotal | | 260 |

| | | |
|---|---|---|
| IMPERIAL COUNTY | | |
| Chocolate Mountains | 120 | |
| Pichaco Peaks | 40 | |
| Subtotal | | 160 |
| VENTURA COUNTY | | |
| San Rafael Peak (reintroduced 1985 and 1987) | 35 | |
| Subtotal | | 35 |
| TOTAL ESTIMATED POPULATION | | 4,661 |

Revised June 1988
*California bighorn; threatened (subtotal 327)
**Penisular bighorn: threatened (subtotal 570)

**WALK INTO DEATH VALLEY**

By Wilford L. Thompson

By the light of the full moon, slowly, I follow my shadow up the steep slope. I am breathing heavily and the muscles in my thighs complain with every step. My face drips sweat and my shirt is sopping. At 9:30 p.m. on July 28, the temperature is more than 85 degrees Fahrenheit, but a fresh breeze cools me.

Pushing the uphill knee with my hand to reduce the pressure on my leg, I turn slightly to the right to take a less steep tack. My determination to reach the crest of the ridge nonstop wanes, and after a few steps on this easier course, I stop for a rest.

As I adjust the straps on my backpack, I turn back to the south and watch my 28 year old son Mark laboring up the slope with large daypack. Traversing toward my left, he moves with the short, deliberate steps that I recognize as his standard uphill gait.

Beyond Mark to the southeast, a vast expanse bathes in the moonlight. The slope we are ascending drops into a deep canyon that opens onto Greenwater Valley. The wash at the bottom winds its way out onto a wide sloping flat, and about a third of the way across, simply disappears into the mosaic of shadows formed by the sparse desert brush.

It is about 5 miles across the valley to a low range of hills. Beyond that range, some 25 miles or so away, the lights of Tecopa Hot Springs appear in a tiny cluster providing the only visible evidence that our planet is inhabited. Unseen 3/4 mile across the mouth of the canyon below, the Jeep that brought us here is parked at the eastern boundary of Death Valley National Monument. At this distance, by moonlight, it is indistinguishable from a boulder.

Turning once again, I scan the terrain above. Less than a hundred yards away, the crest of the ridge slopes at a more gradual angle than the steep hillside. Following the crest with my eye, I spot Jack Glatt, the third member of our trio. Well up the ridge from me and just slightly below the crest, he is moving steadily upward. I take a deep breath and start climbing toward the crest again.

The groundwork for this hike began more than five decades ago when, in the 1980's, R.E. Welles started the "Water Book," a permanent record of more than 300 water sources in Death Valley National Monument. This book, which is maintained on file in the Natural Resources Office near Furnace Creek, is a collection of brief write-ups by people who have visited the wells and springs over the years. For each water source, designated by a number, the book contains information on location, water availability, flow rate, wildlife use, and so forth.

Over the years, many people have contributed brief reports to the book. Still, information on some of the more remote sources is somewhat out of date. On August 25, 1987, Dr. Charles L. Douglas of the Cooperative National Park Resources Studies Unit sent a letter to Don Jones, the Waterhole Coordinator for the California Water and Wildlife Survey, asking that Don arrange for volunteers to inspect springs in the Death Valley area. Of the springs on his list, half are in the Funeral Mountains, half in the Black Mountains.

Both ranges lie on the east side of Death Valley. The Funeral Mountains are north of Highway US 190, the Black Mountains south. The springs in the Funeral Mountains are being inspected by Robin Snowberger. I volunteered to handle the Black Mountains' springs. Last winter, in the course of three weekend trips, I made visits to the springs on Dr. Douglas' list. After reading the reports, Dr. Douglas said that he would like to know the status of these springs in "the heat of summer," when Death Valley temperatures soar to more than 120 degrees Fahrenheit.

I did not want to make the trip solo so I contacted Mark. He is an experienced, level headed backpacker, who plans for contingencies and makes carefully considered decisions. He immediately volunteered to join me and suggested that we make an exploratory trip in May and cache water. He and I hiked over this same route on May 3.

In mid July, the weather bureau reported a high temperature of 127 degrees Fahrenheit in Death Valley, only 17 degrees below the all time high. We decided to attempt the walk by moonlight.

Now, as I labor over the last few steps to the crest of the

ridge, I wonder if Welles walked over this same hill. I make a mental note to study the water book in more details at the next opportunity.

Stepping up to the crest of the ridge, I'm greeted with a strong wind and a breathtaking view. Directly in front of me about a mile to the northwest looms Funeral Peak like a giant partially buried black bier slanting up from the desert floor. Fifteen miles or so away to the north, a few scattered lights mark the location of Death Valley Junction. Beyond that is a cluster of lights that I know to be at a large mine straight east of Pyramid Peak. Then a few isolated lights marked US 95 running from Lathrop Wells toward Las Vegas, Nevada. The planet looks slightly more populated on this side of the hill.

To my left, the crest of the ridge climbs steadily to a round topped hill then drops to the right to a saddle. From that saddle, another ridge stretches out toward Funeral Peak. Unseen, the north end of Gold Valley lies to the west behind that ridge. Our plan is to walk across Gold Valley, and climb over the west rim into the south fork of Sheep Canyon.

We will continue down to the main Sheep Canyon and follow it to the floor of Death Valley. Then we will walk out into the valley to the highway where we have left Mark's pickup truck. I estimate the total distance from the jeep at 13 miles.

I stop to update my notes. At the bottom of the canyon that we've just exited lies Hidden Springs (#142 in the Water Book). The springs have plenty of water and a good flow rate. They are surrounded by tracks and bighorn sheep sign.

Mark tops the crest, emits an appreciative whistle and removes his daypack. We are here at night in order to avoid the extreme daytime temperatures. The incredibly beautiful moonlight view is an extra reward.

Jack, some 50 yards up the ridge, stops. He is a retired tree surgeon, and has worked hard all of his life. Among other things, he has done a lot of tree climbing. His legs are strong. Several years old than I, he is in excellent physical condition.

I met Jack at a Mohave Desert work project in the Old Dad Peak area where he and I had volunteered to help repair a big game guzzler. I was impressed with his matter-of-fact attitude, and invited him to join us for additional backup.

Jack is anxious to move. We have estimated that it will be around 3:30 a.m. when we get to the truck. It is of the utmost importance to get there before sunup, when the temperature will soar. We saddle up and proceed up the long crest of the ridge. It is a leisurely walk compared to the hill.

A quarter of a mile to the west, we top a small round peak and find ourselves looking out across Gold Valley. The 80 degrees Fahrenheit temperature is the lowest we will enjoy on this walk.

Now we begin one of the more difficult parts of the hike. We leave the peak at about 5800 feet and angle down along the steep west side of the ridge for a quarter of a mile to Brown Spring (#143). The hillside is covered with loose rock, and it is a difficult descent.

About two thirds of the way down, the spring is hidden in a small cave at the base of a cliff. There is good water. The odor of bighorn sheep feces and urine hangs in the air. This spring is obviously heavily used. I make a few quick notes and saddle up. It is 10:30 p.m. Now, all that is left is to inspect Sheep Springs. But first, we have to get there.

We continue down the hill and out into a wash that runs the full length of Gold Valley. Following the wash for about half a mile, we come to the first of two water caches. Here, in May, Mark and I buried water. We show Jack where the water is cached. If we get into some kind of a problem situation, this will be our emergency supply.

Laboriously, we climb in and out of several small ravines. At several spots, we debate over the best way to proceed. At last, we top another ravine and look across at what appears to be the last hill. Another ten minute climb brings us to the top where we discover that we still have to cross another ravine and climb out of it to the saddle.

Finally, dripping with sweat, we step up onto the saddle at 4600 feet elevation. High in the southern sky, every detail of the full moon is crystal clear. It illuminates the mountains and valleys for miles. Ridges rise into the black sky to meet stars dimmed by bright moonlight. Canyons are marked by deep shadows. From here the planet, like the surface of the moon, looks uninhabited.

Heat radiates out of the canyon. A slight breeze provides a welcome cooling sensation, like that of a slight draft in front of a wood stove. Six and a half miles away, more than 200 feet below sea level, the floor of Death Valley looks near enough to touch. Only from experience do we know that the shadows between here and there contain some 8 miles of deep winding canyon.

I have long since emptied the canteen on my belt. Now, I am drinking from one of two-liter bottles in my backpack. This one contains an electrolyte replacement solution consisting of lemonade and sea salt. I ask Mark the time. He reports that it

is midnight. I wonder aloud if we will complete the hike before the moon sets. As we start the steep descent into the canyon, I begin to feel fatigue.

It has been a long day since I woke up on the desert at the north end of Greenwater Valley. At daybreak, Jack and I took a 6 mile round trip hike to inspect Lemonade Springs (#146), located in a canyon that runs east out of the Black Mountains. We observed many bighorn sheep tracks, and a lot of pellets. We noted that most of the latter were strung along the trail, indicating that the bighorn sheep that left them were on the move.

Returning from this morning hike just as the sun came up, we drove into Furnace Creek and ate breakfast at the restaurant. Then we visited the Natural Resource Office which is co-located with a Caltrans facility about 3 miles north of Furnace Creek. There, I was pleased to learn that my reports from previous water source inspections had been filed in the Water Book.

We stopped by the visitors center and talked with Head Ranger Clark. He took a written itinerary from us and gave us a 24 hour telephone number for the dispatch office. They will check up on us if we don't contact the office.

We then drove into Death valley and parked Mark's Toyota pickup on the highway opposite the mouth of Sheep Canyon. I took a photograph of Jack and Mark holding a thermometer that indicated a temperature just over 120 degrees. The battery on my camera failed. A few minutes later, I noticed that the battery on my wrist watch had also failed. Both were sensitive to the extreme heat.

We drove Jack's jeep back to the Greenwater Valley road and put it in four-wheel drive for the 25 mile ride to Willow Springs (#140). The temperature was 110 degrees when Jack and I walked the three mile round trip into lower Willow Springs. We found plenty of water and lots of fresh bighorn sheep tracks.

Another 16 miles of four-wheel driving took us to the jumping off point for our evening hike. After a quick cold meal, we left the jeep at 8:20 p.m.

Now, four hours later, we reach the bottom of the south fork of Sheep Canyon, and begin a period of careful trail selection. The canyon has many dry waterfalls. Most of them may be climbed. Others must be bypassed. Luckily, Mark remembers the worst ones and guides us. Following the canyon, we wind in and out of moonlight. Even in the shaded areas, there is enough reflected light that we can continue without flashlights.

Except for the dry falls, the terrain is good. For the most part, we are traveling along a sandy bottom between steep rock

walls. In the four miles to the main fork, only once do we use flashlights to climb down a particularly high dry fall. As we descend, the temperature continues to rise. Finally, at 2:30 a.m., we walk into the main canyon. There, across the canyon is a small patch of willows that I recognize as the upper of the five sources of Sheep Springs (#141).

The only water is a "nose hole" about 3 by 5 inches and 1/4 inch deep. There are fresh bighorn sheep tracks at the spring. Fifty yards down canyon, a 100 foot wide thicket of brush marks the next source. I quickly determine that there is no surface water.

We show Jack where to find the water we have cached here. Then we continue down the canyon. There are no more dry falls, but the footing is very difficult. I am feeling the heat. We walk past two sources without inspecting them. I have already seen that they were dry in May.

We come to the fifth and last source. Here, a large thicket stretches up the north bank of the canyon. While Mark and Jack take a rest, I climb up to the top of the thicket and work my way through the mesquite to the water hole. Two muddy spots about 3 by 3 feet and 2 by 5 feet respectively sit where there were pools before. Both are covered with bighorn sheep hoof prints, and each hoof print contains 1/2 inch of water.

I rejoin the other two. Jack's thermometer reads 96 degrees. We continue walking. The terrain gets steadily worse. We are walking on loose rocks of all sizes and shapes. By now, the bottoms of our feet are sore. Our muscles are sore. Every step hurts. I am nauseous.

On this hike, Mark and I have tested a new theory. Knowing that our water consumption would be between four and five times normal, we have taken a full daily dose of all of the water soluble vitamins and minerals every five to six hours. I have also been drinking the salted lemonade. Until now, it seems to have worked. My energy level has held up well all day.

But now I feel very ill. Finally, I stop, remove my pack, and lay my head on it. I take some toilet paper off to the side and endure comments from Mark and Jack. Then I soak my bandanna with water and bathe my face, neck and head. At last, I resort to throwing up. I decide that I've overdone the electrolyte solution, and take a large drink of water.

Eventually, I feel better, and we continue walking. Now, we must outlast the fatigue. I keep my bandanna soaked with water, and frequently mop the back of my neck and my face. When I wave

the wet bandanna in the air, it becomes cool from evaporation. I hold it to my face, and in a few seconds, the heat from my face penetrates the wet bandanna and warms my hands.

We expectantly approach every bend of the canyon, hoping to see some sign of its opening into the valley. But again and again, we round a bend only to see another stretch of canyon leading to another towering rock wall. There is no more sandy bottom. Every step falls on loose rocks. Jagged rocks send stabbing pain into the bottom of the foot. Rocks that turn underfoot twist the ankle or knee. Every step hurts.

Finally, moonlight floods the canyon wall, announcing its opening into the valley. An infinity of painful steps brings us to the mouth of the canyon. Knowing that the truck is right in front of us, Jack decides to go ahead to find it. Mark and I stay together and focus on maintaining a straight direction. It is a little more than a mile to the truck. We are about 300 yards away when Jack signals with his flashlight. He has located the truck.

At last, we have arrived. It is 4:30 a.m. The moon is flirting with some puffy little clouds over the Panamints to the West. Jack's thermometer reads 98 degrees.

We toss our packs into the back of the truck and turn it toward Shoshone. Except for retrieving the jeep and checking in with the dispatch office, our job is complete. We have met all of our objectives. Euphoria overtakes the fatigue and sore muscles.

Driving south, we watch the moon set behind the Panamints. I have a sense of supreme accomplishment. Walking some 22 miles in the last 24 hours, we have inspected 10 water sources in five different areas of the Black Mountains. All but three of these sources have water and they are clearly being used by bighorn sheep. The year 1988 has been plagued with drought. If the springs of the Black Mountains support bighorn sheep this year, then they will undoubtedly do so for the rest of the century.

## WCB DEDICATES $11 MILLION-PLUS PUBLIC FUNDS TO WILDLIFE

A sum total $11,493,000 was allocated for wildlife related programs by the state Wildlife Conservation Board at its August 11 meeting in Sacramento, according to a Board official.

Al Rutsch, WCB assistant executive officer, said the panel approved 25 project expenditures made available by various funding sources specially earmarked for wildlife habitat and facilities improvements in the state.

Allocations were provided by the 1984 Fish and Wildlife Enhancement Fund, the Wildlife Preservation Fund, the Environmental License Plate Fund and the Parkland Fund of 1984, Rutsch said.

Five Southern California and eastern Sierra projects will be accomplished with a $2,123,700 dedicated portion of the total allotment.

Rutsch said the Board approved $1,235,000 to acquire a conservation easement that would protect from development 378 acres of critically situated desert habitat located adjacent to the State's San Jacinto Wildlife Area in Riverside County.

San Jacinto WA, a 4,100 acre preserve operated by the Department of Fish and Game, provides preservation of habitat that is quickly disappearing to human development enroachment at the western ends of both Riverside and San Bernardino counties.

A wide diversity of wildlife including waterfowl, quail, dove, cottontail and jack rabbits, golden eagles, kites, hawks, coyotes, deer and some 150 species of birds in addition to raptors and game birds, can be found at San Jacinto WA. The area is perhaps best known as a primary habitat for the state listed endangered Stephen's kangaroo rat.

The section to be set aside by the easement purchase is located adjacent to San Jacinto's waterfowl ponds area and within a short distance of the wildlife area headquarters building.

A WCB matching fund contribution of $500,000 was approved by the Board to assist the City of San Diego in its efforts to refurbish Ocean Beach fishing pier.

Located just south of Mission Bay in San Diego, the 2,510 foot-long pier constructed in 1966, has signs of crumbling concrete and steel corrosion in its supporting structure; a situation in need of correction to render the pier safe and sound.

Rutsch said the Board approved a $305,000 request to purchase approximately 25 acres to expand a unique freshwater marsh area located in the City of San Ysidro, San Diego County.

The 25 acre addition would increase the Dairy Mart Pond Ecological Reserve to a total 60 acres, and assure the only known San Diego County breeding location for the snowy egret and the cattle egret is protected from future development.

Biologists estimate the Dairy Mart Pond Ecological Reserve is home for some 260 bird species, including the state listed endangered least bell's vireo and California clapper rail.

A $75,000 allotment was approved to complete a warmwater fish habitat enhancement project to include seven coves on the California side of Lake Havasu, located on the Colorado River in San Bernardino County.

Rutsch said installation of 525 brush shelter structures and 80 cubic yards of gravel within the cove areas, located approximately 25 miles south of Needles, are planned to improve fish habitat.

Biologists expect to see a concentration of bluegill and largemouth bass in the shelter areas within a few months of their installation. Shelter structures are constructed of reinforcement steel bar material that are loaded with brush and then placed on the cove bottoms to provide protection for young warmwater game fishes.

Glass Creek in Mono County will benefit from an $8,700 allotment to enhance habitat for the federally listed threatened Lahontan cutthroat trout.

The funds will be used to stabilize steam banks and provide instream vegetation cover.

Wildlife Conservation Board meetings are conducted four times annually to consider requests for available funds specially designated for wildlife-related use.

The three-member board charged with consideration of all requests for project funds are chairman Albert C. Taucher of Long Beach, Fish and Game Commission president; Pete Bontadelli of Sacramento, Department of Fish and Game director, and Stan Stancell, State Department of Finance Assistant Director.

WCB members are assisted by a joint legislative advisory committee that consists of three state senators and three state assembly members, and is served by a nine-person staff.

**MEMORANDUM OF AGREEMENT**

(Between the California Department of Fish and Game and the Society for the Conservation of Bighorn Sheep)

W I T N E S S E T H:

Whereas, the California Department of Fish and Game has been created under the law of the State of California to provide for the control, propagation, protection, and regulation of wildlife in California.

And, the Society for the Conservation of Bighorn Sheep, a nonprofit organization created for the purpose of conservation, preservation and proper utilization of the Wild Sheep of North America, recognized the need for a management program for bighorn sheep.

Now, therefore, the parties of this agreement wish to achieve a sound and active management program for bighorn sheep which includes but is not limited to: Indepth research; inventories, water development and maintenance; and reintroduction of bighorn to historic ranges.

The Department of Fish and Game agrees to:

1. Provide guidance, direction and critique of all studies sponsored and/or funded by the Society.

2. Consider for publication in California Fish and Game (a quarterly science journal) any papers that result from the above studies and which are suitable.

3. Cooperate, through annual meetings with the Society, on the organization of work parties and work projects for the management of bighorn sheep habitat, and to provide supervision over such parties and on such projects when such supervision is deemed necessary or beneficial, and is mutually agreeable to both the Department and the Society.

4. Provide the Society with copies of all Bighorn Sheep Management Plans and management plans for specific areas of bighorn habitat as they are developed and identify areas where the Society can assist in achieving the goals of these plans.

And, the Society agrees to:

1. Sponsor, fund and solicit funding for specific bighorn studies approved by the Department of Fish and Game.

2. Provide progress reports and completion reports related to such studies, on a regular, mutually agreeable basis, and to provide additional information on the status of such studies on an occasional basis, should the Department so request.

3. Provide or solicit manpower required for Department of Fish and Game field work projects. These may relate to, but are not limited to, such activities as developing or maintaining wildlife watering sites, making counts of bighorn sheep, or capturing, transporting, and relocating bighorn.

4. Provide materials, tools, vehicles, or services to achieve any of the above mentioned programs.

5. Provide a Society representative to participate in the Department's Bighorn Coordinating Committee. A committee made up of representatives from agencies or institutions involved in bighorn management or research in California.

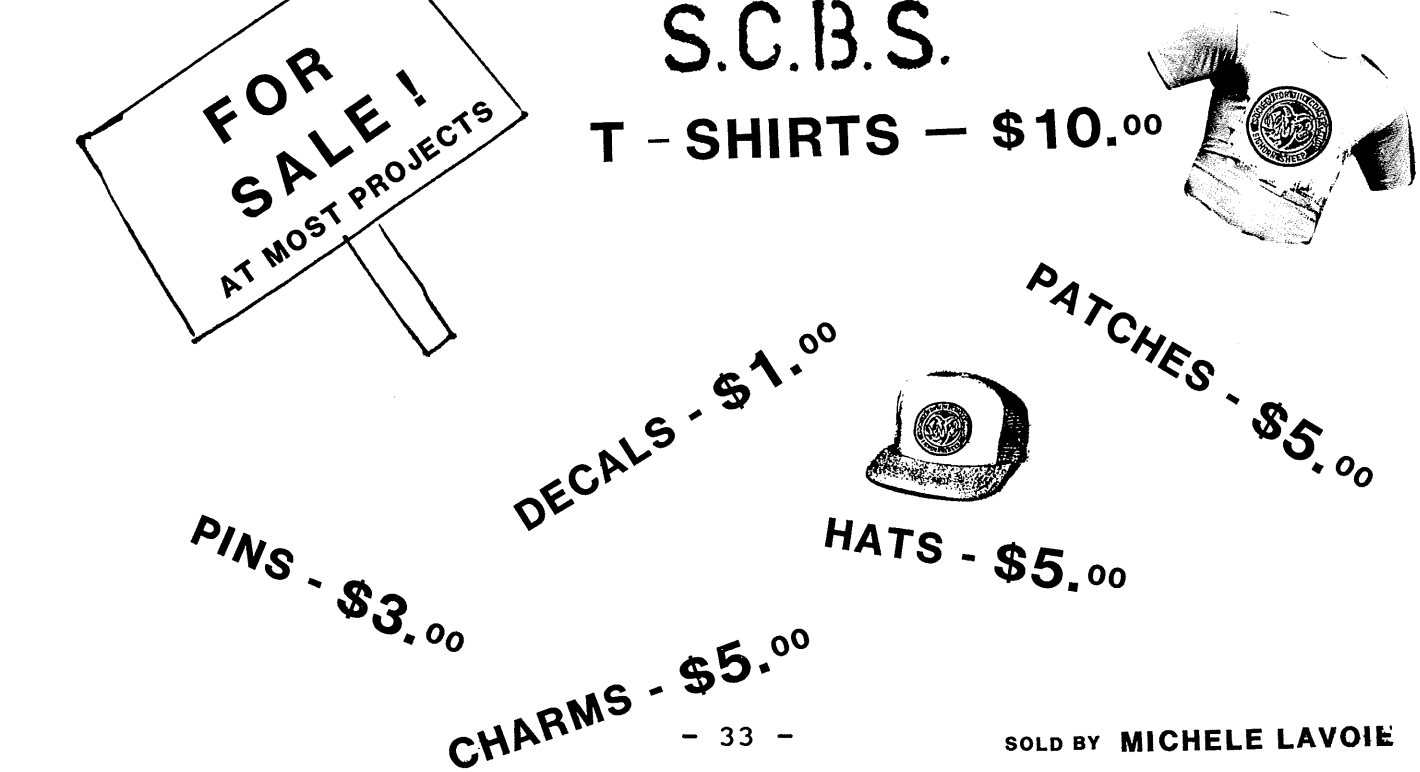
The Department and the Society mutually agree:

1. To work cooperatively on management programs to benefit bighorn sheep.

2. That nothing herein contained shall be construed to limit or affect in any way the authority of the Sate of California in connecting with the administration and protection of the resources under its jurisdiction or carrying out their legally recognized responsibilities.

3. That nothing in this agreement shall be construed as obligating the Department or the Society to expend funds or involving them in any contract or other obligation for future payment of money in excess of appropriation authorized by law.

4. That, this agreement may be terminated at any time by written concern of either signatory.



SOCIETY FOR THE CONSERVATION OF BIGHORN SHEEP
Non-Profit Organization
4139 W. Big Tujunga Canyon Road
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