United States Department of the Interior

NATIONAL PARK SERVICE

REDWOOD NATIONAL PARK
ARCATA OFFICE
P.O. BOX SS — 791 EIGHTH STREET
ARCATA, CALIFORNIA 95521

IN REPLY REFER TO:

N1615

September 21, 1983

Enclosed is an Environmental Assessment for Roosevelt Elk Live Trapping and Relocation in the Orick vicinity. Redwood National Park is cooperating with the California Department of Fish and Game and the Bureau of Land Management to reintroduce Roosevelt Elk into areas where they formerly ranged. In addition, the park is assisting the California Department of Fish and Game in dealing with elk depredation problems in the Orick area. The environmental assessment describes the impacts of relocating 12 to 15 elk to the Bureau of Land Management's King Range National Conservation Area in Autumn 1983 along with alternatives to the depredation problem.

Additional copies are available for public review at Redwood National Park offices in Crescent City, Arcata and Orick, and at local libraries.

The deadline for receiving public comment is October 14, 1983.

Donald M. Spalding
Assistant Superintendent

Enclosure

ELK LIVE TRAPPING AND RELOCATION
ENVIRONMENTAL ASSESSMENT

September 1983

I. PURPOSE AND NEED

Elk live trapping and relocation would be undertaken to fulfill two purposes. First and foremost is a cooperative program between Redwood National Park, the California Department of Fish and Game (CDFG), and the Bureau of Land Management (BLM) for reintroduction of elk into areas where they formerly ranged. The second purpose would be to provide the California Department of Fish and Game with an alternative means to deal with elk depredation problems which chronically occur on private lands in the vicinity of Orick, California.

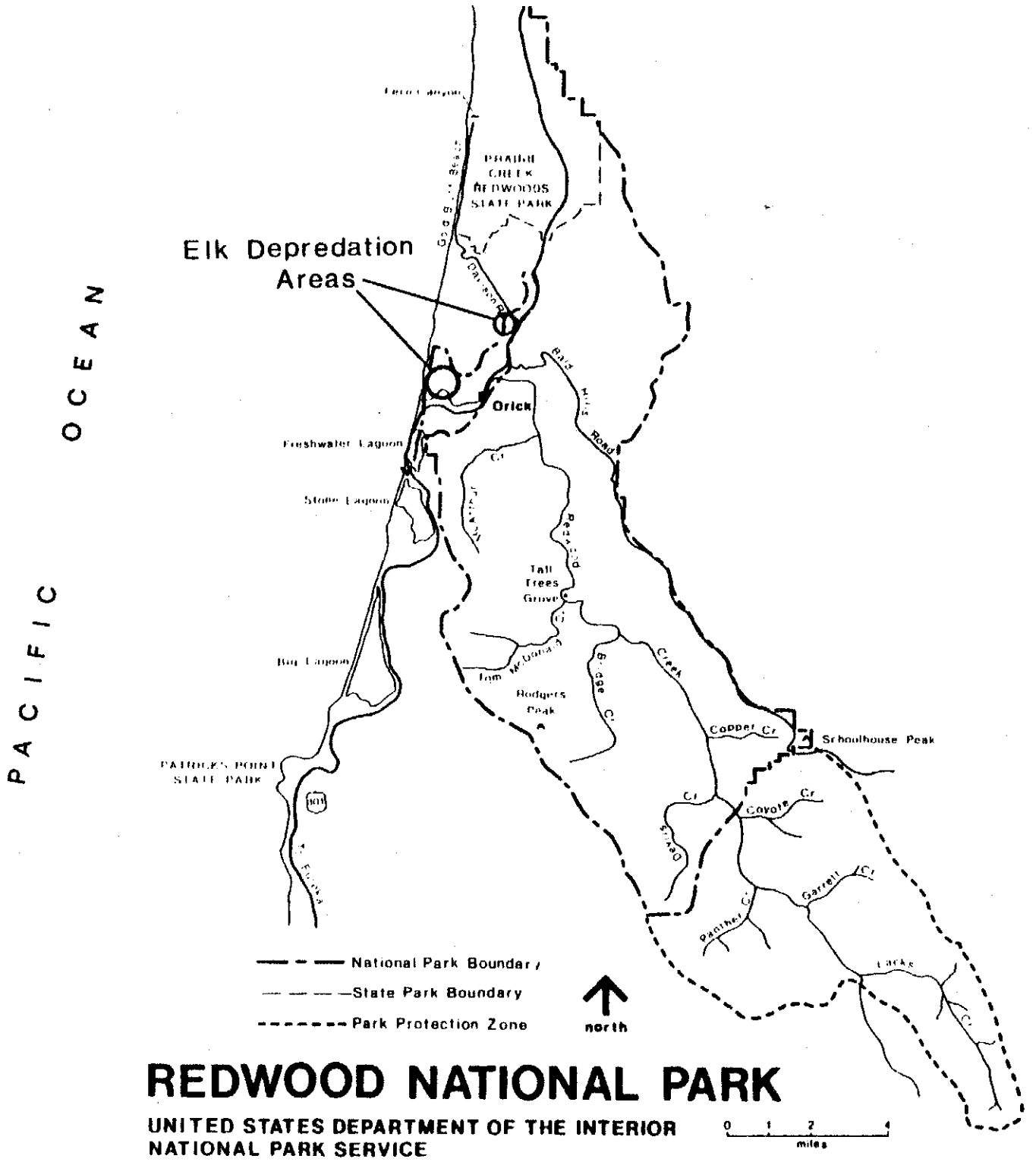
National Park Service management policies provide for the development and implementation of cooperative studies and management plans with States and other Federal agencies for the control and management of wildlife populations. These activities may include public hunting outside park boundaries, live trapping and relocation, providing research specimens, and direct reduction by National Park Service personnel.

The purpose of this environmental assessment is to evaluate the impacts of relocating elk from National Park lands. Although one proposed relocation effort is described in detail, future relocation projects would involve essentially the same procedures and impacts. This assessment addresses both immediate and future (1 to 5 year) relocations of Roosevelt elk.

II. BACKGROUND

A. Historical Elk Distribution

Elk (*Cervus canadensis*) originally ranged over most of central North America (Hall and Kelson, 1959). Primarily due to the interference with agriculture and their suitability as a food source, elk were extirpated in many areas. The Roosevelt elk (*C. c. roosevelti*) was once found from southern British Columbia to south San Francisco Bay (Thomas, 1982). Presently Roosevelt elk are distributed along the Pacific coast from Vancouver Island to southern Humboldt County, California (Dasmann, 1964). Harn (1958) reviewed the status of Roosevelt elk in Northern California. He found two primary population centers located in the Big Lagoon-Maple Creek vicinity, and the Prairie Creek-Gold Bluffs areas (from Dasmann, 1964). Elk reportedly also occur in the Marble Mountains, in the Salmon-Trinities, along the Bald Hills above Orick, and in the Elk River region near Freshwater and Kneeland. Dasmann (*ibid.*) reported elk population estimates for northern California, based largely on guesswork, ranged from 1,000 to possibly more than 2,000. Mandel and Kitchen (1979) estimated the California elk population to be 1,000 to 1,300 with roughly half of those being in and around Redwood National Park.



REDWOOD NATIONAL PARK

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In northern California during the gold rush of 1848-1855 Roosevelt elk were hunted heavily to supply food for mining camps. When the rush was over, settlement began and a great deal of elk habitat was converted to crop land. Elk were then killed to protect against crop depredations. Elk in the mountainous regions, the Marbles, Siskiyous, and Salmon-Trinity Alps were abundant prior to the 1870's. Hide hunters were credited with decimating elk herds in the Marble Mountains. Elk in the Siskiyou Mountains and Mount Shasta were migratory, occupying highlands in the summer and wintering in lowlands. These migratory habits made them more susceptible to hunting pressures, and were therefore, quickly and drastically reduced in number.

Elk occupying coastal lowlands, on the other hand, persisted only in the northern part of coastal California where dense forests and brush fields provided protective cover. In this local area, notably coastal Humboldt County north of Eureka to about Klamath, elk were again locally abundant by 1964.

Following extensive clearcutting of redwood forests within the Redwood Creek region near Orick and Big Lagoon, elk numbers increased, no doubt, beyond herd sizes estimated during the early 1960's. Presently elk are slowly expanding their range from population centers located near Big Lagoon, Prairie Creek-Gold Bluff Beach, and the lower Redwood Creek watershed located either on private timber lands or within Redwood National Park. Elk also appear to be moving from Oregon into their historical range near Grass Lake in Siskiyou County (Patrick McLaughlin and Gary Monroe, personal communication).

In March 1982 a cooperative effort between Redwood National Park, the California Department of Fish and Game, California Department of Parks and Recreation and the Bureau of Land Management resulted in the capture and relocation of 17 elk from Gold Bluff Beach to the King Range National Conservation Area.

Through elk relocation programs, proper habitat management, and resource protection, the State Fish and Game and cooperating State and Federal land managing agencies may again establish viable elk herds on lands within their historical range of northern California.

B. Elk Depredation Problems

Reports of elk depredation problems in the Orick area date back to the 1920's (anonymous 1928, 1929). Damage caused by elk has included broken fences, grazing on pasture lands, harassment of cattle and threats to humans (records on file with State of California, Department of Fish and Game, Eureka). Complaints from the timber industry in the 1950's and 1960's (Harn, 1958; Hofsted, 1961) concerning elk interference with reforestation projects were apparently quieted by Lemos (1971).

Currently, the most persistent damage occurs in the vicinity of the Davison Road in the Prairie Creek valley north of Orick and in the

pasture lands of the Orick valley just south of Orick Hill (see map)(Patrick McLaughlin, personal communication). Both areas are adjacent to Redwood National Park. The elk originate in the park.

Depredatory problems include damage to fences which enclose pasture lands used for dairy and beef cattle grazing, and competition with cattle for forage.

Recent estimates of damage are not available; however, in the early to mid-1970's, several ranchers estimated the cost of elk damage to their property. One rancher estimated a loss of $18,381 from 1971 through 1973, the majority of which was livestock displaced by elk ($11,717), (Doug Lane, personal communication). Another rancher estimated a loss of $13,700 annually, $10,000 of which was attributed to being forced to run fewer cows because of elk competion for forage (Dick Davison, personal communication). Two other estimates of damages were $1,419 and $250 for incidents which occurred in early 1974 (Thelma Hufford, personal communication; Delbert Rocha, personal communication).

The carrying capacity for elk was computed at 1.2 elk per animal per unit month (AUM). One AUM equals one cow/calf unit; therefore, five elk would be equivalent to six cow/calf units.

Cutover lands in and around Redwood National Park have provided excellent habitat for elk and allowed an increase in their numbers over recent decades (Stevens, 1965; Lemos, 1974). As timber cutting has stopped on park lands and cutover areas experience regrowth, elk may be forced into pasture lands in greater numbers, hence increasing depredation.

Over the years, persistent complaints regarding damage to property by elk resulted in five special elk hunts in the 1960's and 1970's. A total of 238 elk (300 permits issued) were taken (records on file with California Department of Fish and Game, Eureka). The hunts were generally regarded as successful and reduced the depredation problems (Patrick McLaughlin, Dick Davison, personal communication). However, the 1978 expansion of Redwood National Park encompassed most of the land involved in the last hunt (held in 1976). The California Department of Fish and Game made an official proposal in 1980 to the National Park Service to hold another special elk hunt on Redwood National Park land (in the vicinity of Orick). The park did not act on the proposal.

Elk depredation problems around Orick are currently handled through the issuance of depredation permits by the California Department of Fish and Game. Section 4181 of the California Fish and Game code requires that the department issue these permits whenever damage or potential damage to property or excessive elk grazing can be proven.

As required by law, depredation permits have been issued to farmers suffering from elk depredation. The number of permits issued per year has varied from 0 to 16. Two elk were taken from 1971 through 1976,

three were taken in 1977, twelve in 1980, and six were taken in 1981-1982 with 24 permits issued (Patrick McLaughlin, personal communication). Nearly all recent permits have been issued for the Prairie Creek and Davison Road area.

III. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

Implementation of any alternative to deal with elk depredation would be an interim solution to one aspect of elk management in Redwood National Park. A separate elk management plan will be prepared to address the long-term maintenance of Roosevelt elk as a component of a naturally functioning, self-sustaining redwood forest ecosystem.

A. No Action

Depredation problems would continue to be handled through issuance of depredation permits. State of California, Department of Fish and Game personnel would issue permits (as described above) to local landowners whose property is being damaged by elk, allowing them to shoot those elk. The California Department of Fish and Game indicates that the resulting meat would be made available to non-profit organizations (Duncan Snell, personal communication). The permits would be issued on an "as needed" basis and no hunting or shooting would occur within the National Park boundaries. Based on past experience, between 0 and 16 permits would be issued each year under this alternative.

B. Relocate Elk (The Proposal)

Relocation would involve trapping, moving, and re-establishing several (from 5 to 15) elk from the Orick vicinity to another suitable area in northwestern California. Generally, a social group would be removed; however, a number of individual animals could also be relocated. Usually pregnant females will be included in the group. Trapping would begin in late summer with baiting the trap site to attract elk. Once the elk had been trapped and moved, they would be held in an enclosure for 6 to 8 months (usually until after calving is complete). After calving, the enclosure would be opened and the animals would be allowed to roam freely.

When considering an area for relocation, the site will have to be surveyed for both the quantity and quality of habitat. Forage inventories and carrying capacity estimates will have to be made to insure that the habitat will support the introduced elk. The method of capture, construction of holding pens, transportation of the animals, delegation of costs, and other considerations will have to be prepared individually for each relocation proposal.

California Department of Fish and Game would be the lead agency responsible for the overall planning, the trapping and relocation operations, and veterinarian services. The Bureau of Land Management would be responsible for assembling and maintaining the holding pen to be constructed at

the relocation site, and monitoring of elk after relocation. The California Department of Parks and Recreation would provide assistance for the trapping operation. Redwood National Park would provide assistance and materials as necessary.

The capture will be accomplished within a baited, fenced enclosure by closing a gate while elk are feeding inside. Numbers of people involved will be kept to a minimum to avoid frightening the elk. Participants will be instructed on acceptable procedures prior to capture and release. Procedures for darting animals will also be covered as a contingency in case trapping efforts are unsuccessful.

A specific relocation project is being planned for fall 1983. Any future relocation to other sites would generally follow the same procedures described below.

Five to fifteen Roosevelt elk, the depredating group, would be live-trapped for reintroduction to the Bureau of Land Management's (BLM) King Range National Conservation Area located in southern Humboldt/ northern Mendocino counties. Trapping sites will be located along lower Prairie Creek, in the Skunk Cabbage area, or in the vicinity of Orick. Final selection of the trap site would depend upon where depredation problems are the greatest, weather conditions and success of baiting animals into the area. Pre-baiting with alfalfa would occur at each site.

Baiting would begin in late summer while trapping and transportation would occur in fall, 1983. The elk would be retained in a 75-acre pen for 8 months in the King Range before being released. Total cost for all agencies involved in relocation 5 - 15 animals is projected to be $18,000 ± $5,000. This estimate includes costs associated with 1-year's follow-up monitoring. The National Park Service portion would be $1,500 for personnel, vehicles and miscellaneous expenses.

Relocation of elk to the King Range has been analyzed by the Bureau of Land Management in their *King Range Management Program* and accompanying Environmental Impact Statement (USDI, BLM, 1974). Specific details and impacts regarding this relocation proposal are analyzed in a separate environmental assessment prepared by the BLM (USDI, BLM, 1981).

Other areas for which interest has been expressed and which may be considered for future elk relocation include the Bull Creek basin of Humboldt Redwoods State Park, and the Sinkyoine Wilderness area in northern Mendocino County. Relocation of elk to any of those other areas would require preparation of more detailed management plans along with more definite commitments of manpower and funds. However, any relocation would involve the same procedures as outlined above.

C. Fencing

An elk-proof fence would be constructed along the Redwood National Park boundary in those areas experiencing elk depredation. The purpose of

the fence would be to keep elk off adjacent private landowner's property. Since California operates under a "fence-out" basis for wildlife and feral animals, it would be the landowner's responsibility to construct such a fence.

This fence would prevent other wildlife from moving onto these same lands. Similarly, such a fence would prevent domestic animals from moving onto park lands. While this fence would not be an enclosure, animals would be blocked from movement except around the ends of the fence. Restricted movement would be confined to the length of the fence for those creatures too large to move through the fence. Since the fence is a limited barrier to free movement, no isolation of wildlife species is anticipated as a result of limited boundary fencing should one ultimately be built.

Approximately 6 miles of fencing would be required. Requirements for an elk-proof fence, as recommended by the Department of Fish and Game, are: Metal mesh at least 8 feet high, with smooth wires placed at 1-foot intervals above the top of the mesh to a total height of 10 feet; mesh should be 12-gauge wire fabric or heavier; mesh size should not exceed 6 inches by 8 inches; a post or at least a 2-inch pipe should be set 3 feet deep in concrete, with line posts at not greater than 10-foot intervals the length of the fence; line braces should be established at 1,000-foot maximum intervals, and be braced and trussed in both directions; corner and gate posts must be braced and trussed; trees must be cleared along the fence right-of-way to eliminate threat of breaching the fence in case the trees fall. The cost would be from $20,000 to $25,000 per mile.

D. Cropping

Individual elk would be removed from the herd by shooting. Cropping would be ongoing and accomplished on a regular basis. According to Mandel and Kitchen (1979), sick animals would be cropped first and cropping would be accomplished totally at random without regard to age or sex. Removal of elk in this manner would be accomplished either by National Park Service personnel or under strict NPS control. Before systematic cropping could be initiated in the park, a cropping model would be developed.

E. Alternatives Eliminated from Further Consideration

1. Habitat Management

Mandel and Kitchen (1979) suggested that habitat manipulation for elk forage within Redwood National Park may be the most feasible solution to the elk depredation problem. Small blocks of vegetation would be cleared, planted with grass, and then allowed to follow a natural succession path. While this may be a reasonable long-range goal, the expense of such an operation and its conflict with National Park Service management policies make it an undesirable option at this time (USDI, NPS, 1978:IV-7).

2. Special Hunt

In general, farmers, foresters, local residents, hunters and the California Department of Fish and Game personnel were pleased with the special hunts of the 1960's and 1970's (records on file with California Department of Fish and Game, Eureka). Farmers noted a definite relief from depredation problems following the hunts. This finding was supported by Stevens' (1965) work on elk densities in the area.

Nevertheless, hunting is not permitted by the public in natural areas of the National Park System (USDI, NPS, 1978:IV - 6,7).

Pasture lands of the Orick and Prairie Creek valleys would not be suitable for hunting due to extensive residential and farm housing. Also elk use the valley bottoms intermittently for foraging and rely on the adjacent hillslopes for cover. A valley hunt might result in a few animals being killed, but the majority would take cover on park lands.

3. Subsidize Adjacent Landowners

Since pasture lands along lower Redwood Creek and especially Prairie Creek help maintain major elk herds, Mandel and Kitchen (1979) felt that elk should not be denied access to those areas. They suggested crop and property depredations could be translated into monetary losses and a subsidy formula could be worked out for payments to those ranchers suffering high and consistent losses. The cost of such a proposal and difficulty in determining damages would make this option unfeasible. In addition, only the State of California would have any potential authority to pay a subsidy. If the State of California were to provide such a subsidy, special legislation would be required because the Department of Fish and Game has no authority to pay subsidies under current State law.

4. Sterilization

Sterilization has been suggested as a means of regulating ungulate populations. Although this practice might be useful at some point in the future, current methods are ill-suited for use on elk. Sterilization is virtually impossible with females and can be done to males only with considerable expense (Banky Curtis, personal communication). Furthermore, by sterilizing those males most likely to fertilize the herd, precisely those genes most desirable to maintain the herd are selected against. As females come into heat, repeatedly if pregnancy is not attained, males cannot maintain their dominance for longer than a month or two. Females would eventually be impregnated at odd times of the year by sub-dominant or young bulls (unless *all* males were sterilized) causing unknown problems.

IV. ENVIRONMENTAL IMPACTS

Roosevelt elk would be the primary resource affected by all the alternatives. Most alternatives (except fencing) would result in a reduced number of elk in or near Redwood National Park. However, implementation of most of the alternatives (the exception is fencing) would only result in a short-term (1-5 years) abatement of elk depredation problems. Elk would repopulate the area and depredation problems would resume. The treatment would have to be re-applied on a regular 1- to 5-year interval.

Alternative A (no action) would result in continued shooting of individual animals believed to be causing depredation problems. Between 1 and 16 elk would be removed each year. Local landowners would continue to experience problems. Based on past efforts, shooting one animal in a group simply scares away the other elk for a day or two. They quickly return to the pasture, breaking down fences in their way. The shootings occur after the damage is done, thus leaving the landowner with a fence to repair. From the landowner's perspective, the situation is made more difficult because the meat from animals shot legally under the auspices of current depredation permits is donated to non-profit organizations.

Alternative B (relocation) could result in a direct reduction of the depredation problem if the elk causing damage were relocated. However, if the relocated elk were not those directly causing problems, only a slight abatement of damage might occur. Relocation of other elk could result in reduced grazing pressure. Elk using the pasture land might expand into the range vacated by the relocated animals.

If the specific animals causing problems were relocated, an immediate reduction in damage would occur. The rate at which the frequency of depredation returns to present levels depends on how quickly the elk population increases and on how attractive the pastures are for forage to the remaining elk. Based on past experience following special hunts, elk depredation problems begin to recur 3 to 4 years after the reduction effort.

Although no mortality is expected, risks are involved with capture, transport and release of animals. Some mortality may occur due to stress. In the 1981 operation, one cow was trampled in the horse trailer and was euthanized. Mortality due to differing environments should be non-existent as the area(s) of capture and release are essentially the same. The confinement in the enclosure for 4 to 5 months should not be a major factor since the area is natural, some 75 acres in size, with abundant food and water during the months of acclimatization and calving season. The enclosure fence, which has no barbed wire and no 90-degree corners, has a burlap vision-blocking-curtain and is 10 feet high, should present no problem. If elk prove to be in poor health, dietary supplements and worm medication will be given to the animals in the enclosure. Predation should not be a problem (USDI, BLM, 1981).

Mitigation measures would include: All operations would be conducted in a humane manner under the supervision of experienced personnel from the California Department of Fish and Game. CDFG veterinarians will examine the

animals at the capture site and at the release site. Only healthy animals will be released. This will optimize survival and protect resident animals. Human activity will be minimized at the release site, as well as the capture site, to reduce disturbance of animals.

Elk would be released in areas of productive habitat where competition from livestock is non-existent. Competition from deer should be minimal as areas produce forage and browse in excess of resident deer requirements. The carrying capacity on a year long basis is greater than 100 elk in addition to resident deer and livestock. Animals would be released in small numbers (5-15) and the release would be timed to achieve optimum acclimatization of both mature and young of year to the area. Capture and release areas are both coastal habitats having similar climate and vegetation. Natural water sources (springs and streams) are available year around (USDI, BLM, 1981).

No land use conflicts were identified by the Bureau of Land Management Environmental Assessment. Competition from livestock was judged non-existent and no agricultural crops are produced in the release area. Poaching was recognized as a potential problem. To control poaching, BLM personnel and California Fish and Game Department law enforcement officers will patrol the area regularly. In future years, as the elk herd grows within the King Range, resident animals are expected to roam onto adjacent lands. At that time, special hunts may be held to deal with any depredation problems or competition with grazing on adjoining pasture lands, should these problems arise. Bureau of Land Management staff have found local land owners supportive of elk relocation efforts. This support might be explained by these land owners anticipating future elk hunts. As of yet, the 16 elk released in 1981 are doing fine.

Limited short-term vegetation trampling and soil compaction would occur at the capture and release sites.

Relocation of elk to other sites (Bull Creek Basin, Bald Hills and Sinkyoine Wilderness) would result in essentially the same impacts regarding both animals and the depredation problem. Similar mitigating measures would be employed.

Alternative C (fencing) would keep elk in the park and off adjacent pasture lands. A fence would also restrict the movement of all other larger types of wildlife (bear, deer) and would also keep cattle off park lands. The fence would have to be fairly complete in the affected areas to prevent elk from simply walking around the end of a fence. The fence would also have to be maintained on a regular basis, probably at a high cost, by the National Park Service. A fence would be visible to travellers along Highway 101 and could be aesthetically displeasing.

Fencing might restrict elk movement and limit interaction and interbreeding between elk herds on the north coast. Other wildlife species could become entangled on the fence, resulting in mortality.

Alternative D (cropping) would result in an unknown number of animals being removed each year. Depending on the quality of the model developed prior to

initiation of cropping and the randomness of removal, no long-term negative impacts to the herd should result. Cropping could result in the long-term enhancement of the herd by reducing the number of animals to their optimum carrying capacity.

V. CONSULTATION AND COORDINATION

A number of meetings or field trips have been conducted during the past years in which the alternatives for dealing with elk depredation and the proposed relocation have been discussed. Dates, location of meeting, and agency participating are listed below:

December 3, 1980. Sequoia National Park. National Park Service/California Department of Fish and Game Technical Committee meeting.

April 8, 1981. Eureka, California. National Park Service, California Department of Fish and Game, California Department of Parks and Recreation.

August 28, 1981. Field trip to Redwood National Park, Skunk Cabbage Creek area. National Park Service, California Department of Parks and Recreation, Bureau of Land Management.

September 2, 1981. Field trip to King Range Conservation Area. Bureau of Land Management, National Park Service, California Department of Fish and Game.

September 24, 1981. Field trip to mouth of Redwood Creek and Skunk Cabbage Creek, Redwood National Park. Meeting at Orick, California. National Park Service, California Department of Parks and Recreation, Bureau of Land Management, California Department of Fish and Game.

October 26, 1981. Prairie Creek Redwoods State Park. National Park Service, California Department of Fish and Game, California Department of Parks and Recreation.

October 27, 1981. Eureka, California. Bureau of Land Management, National Park Service, California Department of Fish and Game.

Mandel, R. D. and D. W. Kitchen. 1979. The ecology of Roosevelt elk in and around Redwood National Park. Report for National Park Service, Contract PX 8480-8-0045. 69 pp.

McLaughlin, Patrick (Wildlife Biologist, California Department of Fish and Game). 1981. Personal communication, conversation with National Park Service personnel.

Monroe, Gary. King Range Roosevelt elk relocation, Humboldt County. 1982. California Department of Fish and Game, Region 1.

Rocha, Delbert. n.d. Personal communication, letter, to California Department of Fish and Game.

Snell, Duncan (Patrol Captain, California Department of Fish and Game). 1981. Personal communication, conversation with National Park Service personnel.

Stevens, M. C. 1965. A preliminary study of the movement, distribution, abundance, and sex and age composition of the Roosevelt elk in and adjacent to Prairie Creek Redwoods State Park. Unpub. M.S. Thesis. Humboldt State College, Arcata, Calironia. 122 pp.

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August 15, 1983

Environmental Specialist

Elk relocation Environmental Assessment

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Superintendent

Through: Assistant Superintendent
Chief, Technical Services

Enclosed is the subject document and copies of correspondence related to a 1982 elk relocation environmental assessment. The enclosed assessment responds to paragraph three of Regional Director Chapman's March 2, 1982 memorandum. The current assessment incorporates comments by regional reviewers (contained in the enclosed January 15, 1982 memorandum) and to public comments received during review of the 1982 assessment. We have also attempted to make this relocation assessment more generic in order to provide compliance for future relocation efforts.

As usual, the time-line for this project is tight. The following is the schedule:

August 15 - 30	In-park review
September 1 - 9	Prepare for Regional Review
September 26 - 30	Prepare for Public Review
October 3 - 31	Public Review
November 1 - 10	Prepare FONSI
December 10	Regional Director signs FONSI

Since elk may be relocated this fall (October or November), I must have your comments by August 30.

John A. Sacklin

Enclosures

cc: Chief, Resources Management w/enc.

RNP:JSacklin:fm:8/15/83