

during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the SLC, USFS and SHPO will comply with all the provisions of this agreement with regard to lands exchanged to SLC during the period of the agreement.

F. Monitoring and Review

The SHPO may monitor activities carried out pursuant to this Programmatic Agreement and the USFS and SLC will cooperate with the Council and the SHPO in carrying out their obligations under this agreement.

G. Compliance

Execution of this Programmatic Agreement evidences that the USFS has satisfied its Section 106 responsibilities and afforded the Council a reasonable opportunity to comment on the exchange of lands in the State of California to SLC and that USFS has taken into account the effects of this undertaking on cultural properties.

FOREST SERVICE, PACIFIC SOUTHWEST REGION

By: _____ Date: _____
DONALD E. STEWART
Regional Forester

CALIFORNIA STATE LANDS COMMISSION

By: _____ Date: _____

CALIFORNIA STATE HISTORIC PRESERVATION OFFICE

By: _____ Date: _____
KATHRYN GUALTIERI
State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____ Date: _____

Reply to: 5500
2630

Date: March 4, 1991

Subject: - State Lands Exchange-Oroville Ranger District
Wildlife Biological Evaluation

To: District Ranger, Oroville Ranger District
ATTN:Linnea Hanson

The project proposal encompasses all National Forest land in sections 1, 2, 10, 12, & 16, T23N, R4E and section 6, T23N, R5E, approximately 2400 acres. The project will exchange these parcels for land of equal value that is currently owned by the State of California.

The only threatened or endangered species documented on the Plumas National Forest are the bald eagle and the peregrine falcon. The nearest bald eagle activity is transient winter use of the North Fork Feather River, approximately 3.5 miles to the southeast. An active eyrie is located on private land approximately 10.0 miles south of the project area.

Peregrine falcons are not known to use the project area. There are no prominent cliffs or rock outcrops that provide nesting habitat within the project. The nearest activity is an active eyrie approximately 16.0 miles to the southeast.

There are no known threatened or endangered species conflicts with this proposed project. There are no impacts to any identified critical habitat for threatened or endangered wildlife species.

Three sensitive wildlife species are known to occur on the Plumas: goshawks, pine martens, and spotted owls(Appendix G, Plumas LMP). Suitable goshawk habitat exists throughout the project parcels, but there is no documented use of the area in the zone wildlife sightings database. Since the current proposal involves a change of ownership with no concurrent vegetation disturbance, the project will not affect the suitability of goshawk habitat. Management Area Direction(Pp.4-119-122, Plumas LMP) makes no goshawk allocations for the project area.

The land exchange would not jeopardize the ability of the Plumas to manage for goshawks.

There are no records of pine martens in the project area, neither are they expected to use the parcels. The entire project is below 4500 feet, the lower elevation limit for martens on the Plumas(Appendix R, EIS for Plumas LMP). Management Area Direction makes no allocations for pine martens in the area.

As noted in California Wildlife and Their Habitats: Western Sierra Nevada, the portion of Butte County that encompasses the project is west of the pine marten's range in the northern Sierras.

... project poses no known conflicts with the maintenance of viable marten populations on the Plumas.

Spotted owls are known to use the project area. A single adult was detected in section 16 on the evening of 6/9/90, and an adult pair was detected in section 12 on the evening of 6/8/90. There are no other documented owl detections in the project area. Suitable habitat for spotted owls is found throughout the project. There is no documented nesting.

There are no Plumas network spotted owl habitat areas (SOHAs) affected by this proposed exchange. The nearest SOHA is site O-3 approximately 1.5 miles southeast of section 12. This SOHA is a Plumas RD&A sample site and has been monitored annually since 1988. This monitoring has documented owl presence in SOHA O-3, but has yet to document pair occupancy.

The exchange proposal poses no threat to the Plumas spotted owl network, and no threat to the Plumas' ability to manage for viable populations of spotted owls. The areas proposed for exchange were not considered for the establishment of SOHAs due to the fragmented ownership pattern and the relative isolation of these parcels from the bulk of the forest.

As previously noted, this project in and of itself poses no threat to the documented owls in the parcels since it involves no concurrent vegetation disturbance. While State lands do not include a SOHA strategy for spotted owl management, this species is categorized as a "species of special concern" by the California Department of Fish and Game. The Department has spotted owl expertise on its staff that is involved in owl management on lands under its jurisdiction.

Management Area Direction makes no allocations for SOHAs in the project area. The spotted owl prescription (RX-12, Plumas LMP) does direct under lands that "By purchase or exchange, acquire lands within SOHAs that will be of benefit to spotted owl habitat". This standard and guideline does not apply to the project since there are no SOHA impacts.

At this time there appear to be no critical issues associated with spotted owls from implementation of the land exchange.

Management Area Direction does call for maintaining or enhancing deer winter range in the Lassen Compartment (#427) which encompasses the project proposal. As defined in the Bucks Mountain/Mooretown Deer Herd Management Plan, winter range has an altitudinal range of 500 to 3800 feet with the bulk of use occurring from 1000-3300 feet.

The National Forest land in section 6, T23N, R5E and sections 1 & 12 are above 3800 feet and fall into the transition zone through which deer migrate between summer and winter range. The remaining parcels in sections 2, 10, & 16, T23N, R4E all fall within winter range.

As noted in the deer herd plan, approximate public ownership of deer winter range is only 10%. Timber companies control a similar amount, with the remaining 80% in private ownership.

With no vegetation manipulation involved, there will be no change in current conditions. As with virtually all of the publicly owned winter range, existing conditions are good to excellent from the cover standpoint but are poor to fair in forage. Estimated carrying capacity under current conditions is less than 13 deer per square mile. Consequently, the exchange affects winter range for less than 32 deer.

To the extent that ownership changes from one public agency to another (USFS-State of California) there is virtually no effect on the deer herd.

The proposed exchange does meet Management Area Direction standards and guidelines for lands. Direction for this functional area does in fact state that these lands should be considered for exchange.

At this time, there are no apparent critical issues associated with wildlife that prohibit implementation of this exchange proposal.

Art Rohrbacher

ART ROHRBACHER
West Zone Wildlife Biologist

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FOR
SENSITIVE, THREATENED, AND ENDANGERED
PLANT SPECIES

PLUMAS NATIONAL FOREST

DATE: March 28, 1991

PROJECT NAME: State Land Exchange
RANGER DISTRICT: Oroville

PROJECT: Phase II, Priority I lands

This Biological Evaluation is being prepared for the set of parcels proposed for exchange with the State of California (hereafter, "State") at the 2/8/91 and 3/21/91 project scoping meetings (Figure 1): all or part of Sections 1, 10, 12, 16 and 24 of T23N, R4E and Section 6 of T23N, R5E. The State Lands Commission plans to manage the parcels for income for the State Teachers Retirement Fund.

Alternatives being considered for this Biological Evaluation are:

(1) No action (land would not be exchanged).

(2) Negotiated action which includes required resource protection. The State Lands Commission would enter into a Land Exchange Agreement which would afford sensitive plants on exchanged lands the same protection provided by the standards and management guidelines used by the U.S. Forest Service (USFS).

(3) Non-negotiated action which includes no required resource protection. Sensitive plants would not receive protection equivalent to that received under USFS management on the parcels prior to exchange.

(4) Rather than a land-for-land exchange, either (a) donation of State-owned lands to the USFS by the State or (b) purchase of State lands by the USFS. In either case, USFS land would not be transferred to State ownership. [Note: this alternative would not satisfy Plumas NF management direction, which directs consolidation of ownership and disposal of all lands in Management Area #1, except for the Macnab Cypress stand, west of a line running south along the section line between Sec. 1 and 2, T25N, R5E, to Sec. 23 and 24, T22N, R4E; LMP 4-120.]

Under Alternatives 2 and 3, State-owned lands, located throughout California within boundaries of several National Forests will be acquired by the USFS. Any sensitive plant species on these lands will come under the management of the National Forest which incorporates them. Region 5 Sensitive Plant Species known or with potential to be on acquired lands are listed in Attachment 1.

PREFIELD REVIEW:

No State or Federal Threatened or Endangered plant species are known from the project area or its vicinity.

Up until the spring of 1990 no sensitive plant surveys had been undertaken in the National Forest lands proposed for exchange, which are in the Lassen NF but administered by the Plumas NF.

The following species have potential habitat or documented occurrences in the surrounding project area:

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USFS Region 5 SENSITIVE PLANT SPECIES: Fritillaria eastwoodiae (FREA), Senecio eurycephalus var. lewisrosei (SEEUL), and Sedum albomarginatum (SEAL)

Proposed Plumas NF SPECIAL INTEREST PLANT SPECIES: Cupressus macnabiana (CUMA)
- Macnab Cypress

Historic collections and sensitive plant surveys conducted by Linnea Hanson, Plumas National Forest (Plumas NF) Botanist, for a previous proposed land exchange identified FREA and SEAL in lands to the immediate west of the currently proposed parcels. The Macnab Cypress is known from two locations 3-5 mi southwest of the proposed parcels. The habitats for each species mentioned - serpentine outcrops for CUMA, SEEUL and SEAL and partially shaded openings in chaparral and coniferous forest for FREA - are also known to occur throughout the project area.

None of these three species is included on State or Federal lists as Rare, Threatened, or Endangered. In the most recent Federal Register notice of review (50CFR Part 17, February 21, 1990), SEEUL and SEAL are listed as Category 2 candidates for Threatened or Endangered status, while FREA is listed at Category 3C. Plants in the latter category are previous candidate species not currently considered candidates because they have proven to be more widespread than previously thought and/or they are apparently not vulnerable to threats from human activity. CUMA is not listed in the Federal Register.

SEAL and SEEUL are both on the California Native Plant Society (CNPS) List 1B ("Plants Rare, Threatened or Endangered in California and Elsewhere"). FREA has been on List 3 ("Plants About Which We Need More Information") (Smith and Berg, 1988) due to unresolved questions about its taxonomic status. However, these questions have been resolved by recent information (discussed under "Analysis of Significant Effects of Project Alternatives", below) indicating its validity as a distinct species. Currently, FREA has been recommended for transfer to List 1B (Bittman, 1991). CUMA is not included in the CNPS lists.

FIELD RECONNAISSANCE:

At the request of the USFS North Zone Lands Office a botanical field investigation was conducted in late March through mid-June of 1990 by Dr. Michael Baad of California State University, Sacramento, under an Interagency Agreement with the University Foundation, to survey potential land exchange parcels. The survey consisted of two visits to each parcel; the first was in the early part of the flowering season in which each parcel was exhaustively surveyed on foot to establish habitat parameters and make preliminary identifications. A second visit later in the season concentrated on probable habitats and completed the sampling. Complete surveys of all serpentine outcrops were also undertaken during both visits.

The survey covered all Priority I lands, which included several more parcels than proposed for the present land exchange. In the parcels currently under consideration, Baad and colleagues found FREA at four sites, in Sections 1, 6, 10 and 12 (see Figure 1). No other sensitive or special interest plant species were found in the current exchange parcels. All sensitive plant locations were

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recorded on USGS topographic maps and site reports were completed; copies were sent to the California Natural Diversity Data Base (CNDDB), in accordance with the California Dept. of Fish & Game (CDFG)/USFS Memorandum of Understanding. [The CNDDB is a part of the CDFG in Sacramento which collects, organizes and makes available records for rare, endangered and sensitive species for the State of California.]

This survey was completed to the appropriate intensity (complete coverage of all potential habitat over the plants' flowering seasons) and approved as adequate (having sufficient documentation of all survey times, routes and findings) by the Plumas NF Botanist, Linnea Hanson.

The field survey report, with all accompanying population discovery records, is on file with the Plumas Forest Botanist.

CONFLICT DETERMINATION:

 No sensitive, threatened or endangered plant species are known and none were found during the survey for this project.

 X The following effects (beneficial, adverse, cumulative, or none) were determined:

(1) Alternative 1, No Project, would have no effect on sensitive plant resources.

(2) Alternative 2, Negotiated Action with Land Exchange Agreement including resource protection, would provide the management needed to maintain species viability of FREA, and would therefore have no adverse effect on sensitive plant resources. A copy of the draft input to the botanical section of the Land Exchange Agreement found in Attachment 2 outlines measures designed to meet the Plumas NF's current Management Direction, Standards and Guidelines for sensitive plants, which are to "maintain viable populations of sensitive plant species", and to "protect sensitive and special interest plant species as needed to maintain viability. Inventory and monitor sensitive plant populations on a project-by-project basis." (Plumas Land and Resource Management Plan, 4-34). The FREA Interim Management Prescription, which provides a recommendation of management activity guidelines for that species, requires that all locations of the plant be protected (Hanson, 1991).

Without a Land Exchange Agreement which effectively addresses sensitive plant protection, FREA would have no assured protection under State ownership. The State Lands Commission itself does not have policies or practices which specifically protect plants. The plant is currently not on the State Rare, Threatened or Endangered Species list, is not at present a candidate for this list, or officially considered eligible because it is not on CNPS List 1B or 2. Since it is a Plumas NF Sensitive Species, its protection under CEQA is provided in the CEQA guidelines, which state

"A species not listed in any listing identified in subsection (c) shall nevertheless be considered to be rare or endangered if the species can be shown to meet the criteria in subsection (b)." (CEQA Guidelines, Section 15380.d)

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Thus the only protection this species now has is its status as a USFS Sensitive Species, which is in effect only on lands administered by a National Forest. With an effective Land Exchange Agreement, however, State ownership of the lands would become equivalent to Forest ownership regarding sensitive plant protection.

(3) Alternative 3, Non-negotiated Action: Land Exchange with a Land Exchange Agreement which does not address sensitive plant protection, could have adverse effects on FREA, because

a) due to lack of sufficient information on its status as a distinct species, FREA is not on the State Rare, Threatened or Endangered Species list and it is not a candidate for this list. Therefore the plant has no clear protection under CEQA;

b) State Lands Commission activities are frequently exempted from the provisions of CEQA via the use of negative declarations and categorical exclusions on any further use of the lands gained through exchange (Jerry Menche, pers. comm. 1991);

c) the Timber Harvest Plans under which logging operations act are exempt from the provisions of CEQA;

d) the State Lands Commission does not have in place policies or practices which protect or manage sensitive plant species (Diane Jacobs, SLC, pers. comm. 1990); and

e) FREA's Federal status was changed in 1990 from a candidate species (Category 2) to a non-candidate (Category 3C) for listing by the US Fish & Wildlife Service (USFWS) (Bartel, 1990), so it no longer has the protections which Federal candidate status might have provided. This was done by USFWS because it was assumed the plant is being protected by management on National Forest lands (Bartel, pers. comm., 1990). (Category 3C status can, however, be changed back to Category 1 or 2 candidate status in the light of new evidence of the species' decline indicated by research results or habitat changes.)

Thus, under this Alternative the exchange of lands would have potentially significant adverse impacts on the viability of FREA occurrences on the lands to be exchanged. This could lead to a petition for Federal (USFWS) listing as a Threatened or Endangered species, and to a reduction in plant species diversity in the project area. The Forest Service is required under NMFA, 36 CFR 219.27g to evaluate management prescriptions, where appropriate and to the extent practicable to preserve and enhance the diversity of plant and animal communities, including endemic and desired naturalized plant and animal species, so that it is at least as great as that which would be expected in a natural forest. In FSM 2670.22, the Forest Service is directed to:

1. Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions.

2. Maintain viable populations of all native and desirable nonnative wildlife, fish and plant species in habitats distributed throughout their geographic range on National Forest system lands.

3. Develop and implement management objectives for populations and/or habitat of sensitive species.

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And in FSM 2670.32, Forest Service Policy for Sensitive Species states:

1. Assist States in achieving their goals for conservation of endemic species.
2. As part of the National Environmental Policy Act process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species.
3. Avoid or minimize impacts to species whose viability has been identified as a concern.
4. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. (The line officer, with project approval authority, makes the decision to allow or disallow impact, but the decision must not result in loss of species viability or create significant trends toward Federal listing.)
5. Establish management objectives in cooperation with the States when projects on National Forest system lands may have a significant effect on sensitive species population numbers or distributions. Establish objectives for Federal candidate species, in cooperation with the USFWS or NMFS [National Marine Fisheries Service] and the States.

Since Alternative 3 could have adverse impacts on FREA, the nature of these impacts is analyzed and discussed below, in accordance with FSM 2670.32, item 4 (above).

(4) Alternative 4, Lands donated or purchased, would be equivalent to Alternative 3 in effects on sensitive plants, since the Land Exchange Agreement would not include protection for sensitive plants.

ANALYSIS OF SIGNIFICANT EFFECTS OF PROJECT ALTERNATIVES:

If Alternatives 3 or 4 are chosen, adverse impacts to FREA would be significant, due to the following considerations:

a) Percentage of plants lost

The known range of FREA consists of five distinct, stable population centers, from Shasta County to Yuba County in Northern California (see Figure 2). In the Paradise-Magalia area (the northeast part of population center "2" in Figure 2, an approximately 60-sq mi area), where the proposed exchange parcels are located, there are 20 known occurrences of FREA. Within these, the number of FREA individuals varies from 2 to 100, with an average 28 per occurrence and a total of about 569 individuals. In contrast, throughout the range of the species the average number of plants per occurrence is 78 individuals. Thus in the Paradise-Magalia area FREA occurs in low numbers, indicating that FREA is not abundant in the project vicinity. Loss of the 80 individuals in four occurrences found on the parcels to be exchanged would represent approximately 14% of the FREA population in the Paradise-Magalia

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area. This is a significant impact on one of the five known population centers within the range of this species.

b) Clarification of taxonomic status

FREA has a history of confusion as to whether it is a distinct biological entity, or some natural hybrid of two other members of its genus. This confusion is due in part to the diversity of morphological patterns - flower color and shape and dimensions of reproductive structures - displayed by the plant, and in part to an incomplete understanding of the plant's geographic distribution in relation to its nearest relatives. This uncertainty has also contributed to keeping this plant, which has a relatively narrow distribution, on CNPS List 3, ("Plants About Which We Need More Information"), instead of on List 1B, ("Plants Rare, Threatened or Endangered in California and Elsewhere"). This status on List 3 has fostered the misconception that this species is not as important, from a conservation standpoint, as the species on List 1B.

As a result of consultations with several experts in plant genetics, botanists familiar with FREA, and a 1990 isozyme analysis of FREA, F. micrantha and F. recurva, FREA is now considered to be a distinct entity at the species level. More study, to better understand its relationships with other closely related members of its genus (specifically, F. micrantha and F. recurva), would be valuable. Factors contributing to this clarification of FREA's taxonomic status are:

• A map of the entire species distribution of FREA (Appendix) has been prepared, including every known location and reliable sighting. Occurrences of FREA's two closest relatives (and purported original parents), F. micrantha and F. recurva, represented by specimens at the California State University Chico Herbarium, are also included on this map. Mapping these purported parental species has helped clarify the status of FREA as a distinct, independent species, since it shows that FREA occurs even where one or both supposed parents are absent. [If both "parent" species are not present in the same immediate area as FREA, to provide continuous genetic input, then FREA cannot consist of a collection of simple hybrids.] On a separate copy of this map, each FREA occurrence has been assigned a number which corresponds to a tabulation of information on elevation, substrate, taxonomic affinity, and number of individuals for each occurrence. (A copy of the numbered map and tabulated data is on file with the Forest Botanist.) This mapped information has provided a basis for evaluating FREA's range limits, numbers, population distribution patterns, habitat diversity, and potential sensitivity to removal of or negative impacts on given parts of its overall range.

• An isozyme analysis, conducted by Rancho Santa Ana Botanical Garden in 1990 (Mistretta, 1990; Beckstrom-Sternberg, 1990), reported that FREA has ten unique alleles (variants of genes for certain traits) when compared to both F. micrantha and F. recurva. This means that FREA cannot be merely a result of simple crossings and recrossings of the latter two species, since it possesses gene forms that neither of them contains. Although the results of this analysis are incomplete due to sample size limitations, they strongly suggest the uniqueness of FREA as a separate entity. A copy of the isozyme study is on file with the Forest Botanist.

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• Consultations with several botanists familiar with FREA in various portions of its range showed a consensus that the plant was a distinct species but that the species produces a wide range of diversity of form. This morphological diversity results in FREA being, at times, rather difficult to distinguish from the other two members of its genus discussed above. The observations of these experts are summarized briefly:

Roger Macfarlane, who described FREA, discussed a possible hybrid origin for FREA, but called it a "distinct species belonging to a rather difficult taxonomic unit" (Macfarlane, 1978). Misinterpretation of this statement by later workers has contributed to the questioning of the status of FREA as a distinct species (the "hybrid hypothesis"). In a later conversation with the Forest Botanist, Macfarlane stated that to distinguish FREA from its relatives five morphological characters (flower color, tepal form, nectary size, style division, angle of flowers on stem; see glossary in Attachment 3 for definitions of terms) are necessary to take into account, rather than any one distinguishing characteristic (Macfarlane, pers. comm. 1989).

Donald Santana, who wrote a doctoral dissertation in 1984 on some characteristics of the genus Fritillaria, recognized FREA as a species (Santana, 1984). He was skeptical of this status, but pointed out there was no conclusive evidence to support or refute any hypothesis that FREA was not a species (Santana, 1988). He did observe that FREA had variable nectary color from site to site whereas in most other Fritillaria species the color does not vary; this does set FREA apart from its relatives.

Brian Ness, author of the chapter on the genus Fritillaria for the upcoming new Jepson Manual of the Flowering Plants of California, treats FREA as a distinct species (Ness, 1991). He is aware of the "hybrid" theory but feels there are problems with the hypothesis since in order to support it both parents (i.e. F. micrantha and F. recurva) would have to be present in the areas where FREA is found, and this is not the case (Ness, pers. comm. 1991; see also Appendix).

Dean Taylor, principal investigator in a large botanical survey for a PG&E/PGT pipeline in the northern part of the state (Taylor, 1990), discovered FREA in the area of Shasta County north of Shingletown, and has also observed the plant in other parts of its range. He feels that there has not been enough evidence to support or refute the "hybrid hypothesis". However, he is of the opinion that with the unique alleles reported in the 1990 isozyme study, taken together with the morphological differences between FREA and both purported parents, the evidence indicates that FREA is a distinct entity with genetic separation from those close relatives (Taylor, pers. comm. 1991). Furthermore, Taylor points out that the great variability seen within FREA occurrences can easily occur within "good" species and does not necessarily indicate simple hybridization. He states that such spontaneous hybridization happens only sporadically in plants, resulting in occasional isolated individuals or "swarms" which are generally of very restricted distribution and inconsistent over time, and would not result in the number and distribution of occurrences observed for FREA.

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Vern Oswald, author of the local flora for Butte County (Oswald and Ahart, 1991), treats FREA as a distinct species. After revisiting all known FREA occurrences in the Paradise-Magalia/Honey Run, Bald Rock, and Forbestown areas, he altered his key to reflect the observation that morphological variation within a site was an indication of FREA, whereas relative uniformity of morphological characters (flower form and coloration) within a locality were indicative of the most easily confused relative, F. micrantha (Attachment 4).

Les Gottlieb, professor of genetics at U.C. Davis and author of texts on rare plant genetics and conservation, feels that since FREA consists of a series of stable populations, rather than a random scattering of occasional individuals, it exhibits the behavior one would expect of a distinct, separate species and not a simple hybrid of other species. He points out that FREA's origin may have been as a cross between two other species which still exist (namely F. micrantha and F. recurva), but that FREA presently exhibits the signs of a stable, distinct species. The lack of reproductive isolation, meaning that the other two species will occasionally hybridize with FREA where their present ranges overlap, does not mean that FREA does not exist as a distinct species, but only that there are three "sister species" which can still produce successful crosses. More information is needed to know more about the possible origins of FREA, its development as a species, unique environmental parameters to which it is adapted, and the nature of its relationships with F. micrantha and F. recurva, but Gottlieb understands FREA as a legitimate species in its own right (Gottlieb, pers. comm. 1991).

c) Degree of protection of remaining plants

Donald Santana has observed that "Fritillaria wherever it occurs is just "holding its own" but losing ground to human intrusion. None of the Fritillaria species can be considered aggressive" (Santana, 1988). Throughout its range, FREA is found on unprotected private land except for in the Bald Rock and Forbestown areas and parts of the Paradise-Magalia area. In these areas, FREA is on National Forest land, managed as a sensitive species, maintaining the species viability throughout the parts of its range within National Forest lands. Occurrences in Shasta County are on private land; only those within studies done for particular projects, where mitigation measures have been recommended, are protected (assuming these measures are implemented). Of the 28 known occurrences of FREA in Shasta County, only four have recommended mitigation measures to protect the plants: two locations (about 1250 plants) at the Volta 2 Powerhouse site (Nelson, 1979) and two PG&E/PGT pipeline locations (about 530 plants) (Taylor, 1990). However, implementation of these mitigation measures has not been verified.

In Butte County, logging and development pressure characterize much of the Honey Run/Paradise-Magalia population center. No formal protection policy for FREA exists in Butte County, although in recent years the County Planning Department has been requiring mitigation measures, implementation and monitoring under a botanist's advice wherever FREA is found on a project under its permitting authority (Sanders, pers. comm. 1991). The plant is at the greatest risk of extirpation (permanent local disappearance) in this population center because of private logging above Paradise and residential development throughout. However, the County's new practices, if consistently implemented,

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may provide sufficient protection to preserve the status quo for FREA on projects under their jurisdiction in this area.

Neither Shasta nor Yuba Counties have policies or practices specifically protecting sensitive plant species; both counties handle tracking of sensitive plants on a project-by-project basis. Because FREA is not State or Federally listed, its potential presence would not be recognized by either county, who consult the California Dept. of Fish and Game and the US Fish and Wildlife Service for resource concerns. Only if an Environmental Impact Report is required and a botanical survey is performed, in which a botanist recommends impact mitigation measures, is the plant protected. (Calarco, pers. comm. 1990, and Walker, pers. comm. 1991).

d) Biogeographical importance of Land Exchange parcel plants

Throughout its range, FREA occurs at elevations ranging from 360 ft at the Covered Bridge site in Butte Creek Canyon to 4320 ft at the Butte Meadows Campground. Most plants occur between 1800 and 3300 ft elevation. Except for the one occurrence at the Butte Meadows Campground, which has not been recently visited or verified, the FREA occurrences in the parcels currently proposed for exchange represent the highest elevation occurrences in the overall range of the species. They are also the farthest northeast of all FREA locations in the Honey Run/Paradise-Magalia population center. As such these plants may be on the edge of some as yet unknown environmental barrier for the species; thus the FREA in the proposed exchange parcels are geographically unique and could be genetically unique.

The proposed exchange parcels are near what Macfarlane felt to be the center of the species' range, at the edge of the Paradise area, which is the area in which he observed FREA to be most taxonomically distinct and positively identifiable (Macfarlane, pers. comm. 1989).

Furthermore, these parcels are the only place in the species' range known to contain all three variants on the FREA theme, namely, distinct FREA, intermediates between FREA and F. micrantha, and FREA tending towards F. recurva. This is the locality within which further research into the relationships of these three species and the origins of FREA would logically take place, according to plant geneticist and evolutionary biologist L. Gottlieb (pers. comm., 1991). Thus to lose this segment of the distribution of FREA could remove the area most likely to reveal needed information about the evolutionary status of this plant.

IMPACT SUMMARY:

The loss of 80 FREA individuals to the State Land Exchange project under Alternatives 3 or 4 would probably not of itself result in loss of overall species viability or create significant trends toward Federal listing. However, loss of the FREA occurrences in the parcels currently proposed for exchange would nevertheless constitute a significant adverse impact on FREA, because

1) FREA is a distinct species of relatively narrow distribution consisting of five population centers, which is threatened in a portion of its range due

to development and logging on private land (all of Shasta County and Honey Run area occurrences and a portion of the Paradise-Magalia area occurrences);

2) the FREA in the proposed exchange parcels are the highest elevation locations in the species' range and the farthest northeast in the population center, and could therefore be genetically unique;

3) these parcels are near the heart of the species' range where FREA is the most reliably identifiable;

4) the project area represents the only place in the species' range containing all three FREA variants, a condition needed for further study of the plant;

5) these parcels represent part of the small proportion (approximately 17%) of FREA populations on protected (USFS) land, the species being otherwise unprotected (i.e. in approximately 83% of its locations throughout its range) from logging and development; and

6) FREA is relatively rare in the project vicinity, and loss of 14% of the plants in the Paradise-Magalia area would be a significant impact on one of FREA's five population centers. As a comparison, Mary Meyer, CNPS botanist for Forest Plan review, uses (approximately) 10% as a proportion of a species population at which losses become significant, threatening the viability of the population in that area.

With an effective Land Exchange Agreement with the State Lands Commission these significant impacts would be prevented.

CUMULATIVE EFFECTS:

(1) Fritillaria eastwoodiae (FREA) and Senecio eurycephalus var. lewisrosei (SEEUL):

The lands currently proposed for exchange to the State are a part of a larger series of parcels slated for exchange out of Forest Service management; these include the two parcels of the Weimer Land Exchange (initiated in 1988), the current State Land Exchange parcels, and several parcels for future exchange (Figure 1). All of these lands are located within the Paradise-Magalia portion of the range of FREA, in Plumas Forest Management Area 1 (LMP.4-118 to 122).

Should all of these lands be transferred out of USFS management without an accompanying Land Exchange Agreement which includes protection for sensitive plants, the continued existence of all of the locations of FREA and SEEUL in these parcels must be considered adversely affected, which could constitute a significant impact on these species' viability. This is a worst-case scenario, but must be assumed since there are no measures in place to protect either species from the impacts of logging and road building which are likely to take place throughout the exchanged lands. Neither species is listed as Rare, Threatened or Endangered with the State of California, although SEEUL is considered a candidate for State listing since it is on CNPS List 1B. The provisions of CEQA would require inclusion of SEEUL and possibly FREA in the discussion of potential impacts in an EIR, (although CEQA would not protect either plant from "taking", or destruction). However, many of the activities of the State Lands Commission and the Timber Harvest Plans required of private logging companies are exempt from CEQA, leaving resources such as FREA without

administrative protection. The plant's status as a Forest Service Sensitive Plant does not have effect on lands under state or private ownership. Loss of all FREA locations on all National Forest lands in Management Area 1 (map in LMP, 4-118) to be slated for exchange would be a significant adverse impact, because all the considerations outlined in items b) through d) above would apply, in addition to the following:

• Exchange of this approximately 11 sq mi of land would result in loss of an estimated 11 occurrences of FREA at an average of 28 individuals per occurrence, or about 300 individuals. (This is based upon Baad's 1990 survey in the same general area, which found 8 occurrences in 8 sq mi, or 1 occurrence per sq mi on the average. Added to this was a tally of Baad's and other known occurrences in the Paradise-Magalia area which reported information about numbers of plants, totalling about 370 plants in 13 occurrences, or 28 plants per occurrence on the average.) The numbers of this species rise and fall from year to year as habitat expands and contracts, the bulbs do not send up flowering stalks every year, and many researchers have not reported counts of individuals, so the exact number of individuals present at any one time is not known.

Keeping this in mind, and using the closest estimate possible for the 1990 season, the loss of approximately 300 individuals would represent 54% of the estimated total of about 570 individuals known in the Paradise-Magalia area, 5% of all known FREA individuals as of 1990, and about 14% of all known FREA occurrences. This loss would create a major gap in the middle of the distribution of FREA, and would remove a percentage of the overall species population which could result in a loss of species viability.

• Loss of the majority of the Paradise-Magalia FREA population would be biologically significant since this area is the only one in the whole species range in which the plants are found on serpentine soils. In the other parts of its range, FREA is found on decomposed granite (Bald Rock area), reddish mountain soils, rocky clay, and Tuscan mudflow soils of volcanic origin (Centerville Road, Skyway, Covered Bridge). Losing an entire population area occurring on a unique substrate would remove an important part of the genetic diversity of this species. This would significantly impact the genetic variability of the species, which could limit the variety of habitats in which the species could exist.

• Another consideration is that the Paradise-Magalia population area may be the only link in a series of stepping-stones for gene flow to reach the Manton area (Shasta County) FREA locations. So far, we do not know if FREA inhabits the large expanse of Tehama County which lies between the two areas. Removal of the Paradise-Magalia FREA could mean cutting off the Shasta County portion (northern end) of the plant's range. In any case, removal of the central Paradise-Magalia area could result in isolation of the two ends of the distribution, thus dividing the range of FREA in a way that alters its subsequent evolution and jeopardizes the ability of the species to persist.

(2) Cupressus macnabiana (CUMA):

The Macnab Cypress (Cupressus macnabiana), a species of public interest and a Plumas Forest Special Interest Species, is present on one of the Weimer Land Exchange parcels. Another location within lands slated for future exchange has been named the Magalia Cypress Botanical Area in the Plumas Forest LMP (Hanson, 1989). The Direction, Standards and Guides for this area, which is in the Flea Mountain Management Area (M.A. #1), state "Protect unique botanic value (20b); Maintain the Macnab cypress stand; employ Rx-7 [Minimal management]." (LMP 4-121, 122) Since this serpentine endemic is being impacted by OHV use and is of public interest, and is protected only under the Plumas Forest LMP, transfer out of Forest ownership without formal protection is assumed to be a significant adverse impact on the plant in this part of its range.

RECOMMENDATIONS:

The Plumas NF is directed in its Land and Resource Management Plan to dispose of project area lands via exchange in order to consolidate ownership in the Flea Mountain Management Area (LMP 4-120). In order to comply with this part of the LMP and to prevent significant impacts to sensitive plant species in compliance with Forest Service Manual (FSM) 2670.22 and 2670.32, Alternative 2, Negotiated [land exchange] Action which includes required resource protection, is recommended.

To prevent both immediate and cumulative impacts of land exchange out of USFS management, enter into a Land Exchange Agreement which incorporates the provisions of the Plumas National Forest Land and Resources Management Plan (LMP) standards and guides relative to sensitive plants, and applies them to all lands to be exchanged, both present and future.

The Plumas Forest LMP standards and guides state: "Maintain viable populations of sensitive plant species. Protect sensitive and special interest plant species as needed to maintain viability. Inventory and monitor sensitive plant populations on a project-by-project basis." (Plumas National Forest Land and Resources Management Plan, 1988, 4-34). The EIS for the LMP also states, "Current management direction is to survey planned project areas and avoid or limit disturbance to identified populations, survey potential habitat, and develop comprehensive species management guides that specify actions necessary to maintain species viability." (EIS, 3-57)

For FREA, the Land Exchange Agreement must follow the Forest's Interim Management Prescription for this species, which specifies that all populations must be protected. This means that although the landscape may be altered in some way, the plant occurrence cannot be eliminated. Suggested implementation of this prescription follows Plumas NF practice: a Controlled Area symbol is placed at each known FREA location, black-and-red striped flagging (universally recognized avoidance colors) delineates the occurrence (plus an approximately 30-foot wide buffer) in the field, and the occurrence is made known to the contractor, logging company, or other user so that the plants within the flagged areas will be avoided. Consultation with qualified botanists to implement these measures is necessary.

For parcels within LMP Management Area 1 not yet proposed for exchange, further surveys must be undertaken to determine if FREA, SEEUL, or CUMA are present on any of these lands (see Figure 1, Future Exchange Lands). Where any of these species is found to be present, all occurrences must be protected according to provisions in the Land Exchange Agreement. This does not preclude the necessity of searches for other Sensitive or Special Interest plants prior to further land exchanges.

This memo has documented the completion of the steps outlined in the Regional Office direction and the 2670 Section of the USFS Manual regarding Biological Evaluations for Threatened, Endangered, and Sensitive Plant Species for this project.

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ATTACHMENT 1

SENSITIVE PLANT SPECIES TO BE ACQUIRED BY USFS IN STATE LAND EXCHANGE

FOREST	TAXON	KNOWN LOCATION(S) ON EXCHANGE LAND	HABITAT ON LAND OR SPECIES KNOWN NEARBY
Shasta-Trinity	Limnanthes floccosa ssp. bellingeriana	X	
	Lewisia cotyledon ssp. howellii		X
	Penstemon filiformis		X
	Lewisia cantelowii		X
	Linanthus nuttallii ssp. howellii		X
	Minuartia rosei		X
	Sedum obtusatum ssp. paradisum		X
	Lewisia cotyledon ssp. heckneri		X
	Trillium ovatum ssp. oettingeri		X
	Klamath	Perideridia leptocarpa	
Trillium ovatum ssp. heckneri			X
Lassen	(none)		
Tahoe	Ivesia aperta		X
	Ivesia sericoleuca		X
Sierra	Carpenteria californica	X	
	Lupinus citrinus		X

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SENSITIVE PLANT SPECIES TO BE ACQUIRED BY USFS IN STATE LAND EXCHANGE

FOREST	TAXON	KNOWN LOCATION(S) ON EXCHANGE LAND	HABITAT ON LAND OR SPECIES KNOWN NEARBY
Sierra, cont.	Calyptridium pulchellum		X
Plumas	Vaccinium coccinium		X
	Ivesia aperta		X

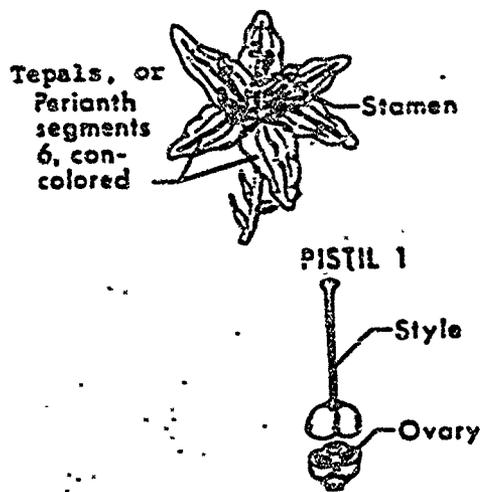
Source: Forest Botanists on National Forests listed.

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ATTACHMENT 3

GLOSSARY OF TERMS

- Extirpated Permanently removed from one locality, in a part but not all of a species' range.
- Morphology External form; in plants, refers to shape, size, color, surface texture, etc. of major parts such as stem, leaves, flower parts.
- Nectary A gland producing nectar, usually at the base of a petal, and often having a color, surface texture or other appearance different from the petal's.
- Style The tubular projection from the ovary of a flower; see diagram.
- Tepal Either the petal or sepal (see diagram) of a member of the lily family or other monocot having petals and sepals which look identical



LILIACEAE



Fritillaria sp.

ATTACHMENT 4.

Key to the genus Fritillaria,
from Oswald (1991). Manual of the Vascular Plants
of Butte County, California

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Fritillaria L.

Reference:
Macfarlane, R.M. 1978. On the taxonomic status of *Fritillaria phaeantha* Eastw. (Liliaceae). *Madroño* 25:93-100.

- 1 Style 3-lobed but not cleft; flowers uniformly pinkish-purple. *F. pluriflora*
 1 Style obviously 3-cleft.
 2 Flowers faintly or not mottled.
 3 Flowers fairly uniform in color and shape in a population; gland greater than 1/3 the length of perianth segments; flowers openly bell-shaped; style divided more than 1/2 its length, the style branches strongly recurving. *F. micrantha*
 3 Flowers usually quite variable in color and shape in a population; gland less than 1/3 the length of perianth segments; flowers not openly bell-shaped; style divided less than 1/2 its length, the branches not strongly recurving. *F. eastwoodiae*
 2 Flowers plainly mottled. *F. recurva*
 4 Flowers scarlet, checkered yellow.
 4 Flowers purplish-brown, mottled with yellow.
 5 Flowers deeply bowl-shaped; gland of perianth segments yellow-green with purple dots; rice-grain bulblets present; flowers in forest above brushy places below 2500 feet. *F. lanceolata*
 5 Flowers openly bell-shaped; gland indistinct, brownish yellow; rice-grain bulblets absent; openings in forest above 4000 ft. *F. atropurpurea*

Fritillaria affinis (Schultes) Sealy - CHECKER LILY. Scattered to locally abundant on rocky and brush-covered canyons slopes from Lime Saddle Recreation Area bordering Lake Oroville northward to Cohasset Ridge. 300-2000 ft, RW, FW, C, [Cs]. Late Jan-Apr. [*F. lanceolata* Pursh—Jepson, Abrams, Munz, VPPNW]

Fritillaria atropurpurea Nutt. - PURPLE FRITILLARY. Occasional in openings in forest in the northeast tip of the county. 4400-6900 ft, YPF, RFF, [Cnc]. Mid Apr-Jul.

! *Fritillaria eastwoodiae* Macfarlane - BUTTE FRITILLARY. Occasional on brushy slopes in foothills and lower coniferous forest. Macfarlane (*op. cit.*) discusses the probable hybrid origin of *F. eastwoodiae* from *F. curva* and *F. micrantha*. Most Butte County populations of *F. eastwoodiae* show a high degree of variation as might be expected in a plant of hybrid origin, and in southeast Butte County, *F. eastwoodiae* is not always easily distinguishable from *F. micrantha*, which grows in the same area. 500-3000 ft, FW, C, YPF, [Ccs, SN]. Mid Mar-Apr. CNPS Inventory 3/1-2-3. [*F. phaeantha* Eastw.—Munz]

Fritillaria micrantha Heller - BROWN BELLS. Occasional on road-cuts, in ravines, and on shaded forest floor in the upper foothills and lower coniferous forest. 1000-2900 ft, FW, YPF, [SN]. Mid Mar-Apr. [*F. parviflora* Torr.—Jepson; *F. multiflora* Kellogg—Abrams]

! *Fritillaria phaeantha* Torr. - ADOBE LILY. Uncommon in heavy clay soils north of Chico. 200-300 ft, VG, [SVn]. Early Mar-Apr. CNPS Inventory 1B/1-2-3.

Fritillaria recurva Benth. - SCARLET FRITILLARY. Common on the floor of coniferous forest, with occasional plants on brushy slopes in the foothills. 700-4400 ft, FW, YPF, [C, SN]. Early Mar-May.

Hastingsia S. Wats.

Hastingsia album (Dur.) S. Wats. - WHITE-FLOWERED HASTINGSIA. Locally abundant in boggy meadows between Butte Meadows and Jonesville. It has also been collected along Chico Creek at Ponderosa Way between Forest Ranch and Cohasset. Watson's transfer of this species to *Hastingsia* has been followed in some recent journal articles (see *Madroño* 36:208-216, 1989). 1500-4700 ft, RW, YPF, [Cns]. Mid Jun-Jul. [*Schoenolirion alba* Dur.—Jepson, Abrams, Munz]

Iphëion Raf.

[In *Amaryllidaceae*—Munz]

+ *Iphëion uniflorum* (Lindl.) Raf. - IPHEION. Garden plant escaping and becoming weedy in lawns and waste places. 100-300 ft, U, VG, FW, [SVns, Cs] Early Mar.
 [*Brodiaea uniflora* (Lindl.) Engl.—Munz Suppl.]

Lilium L.

1 Places of dry places.

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REFERENCES

- Baad, M. (1990). Sensitive Plant Survey of the Phase II Land Exchange Parcels. Butte County, California: Priority I Portion. USDA, Lassen National Forest; Trustees of the California State Universities. Dept. of Biological Sciences, California State University, Sacramento
- Bartel, J. (1990). (revised list of California rare, threatened, endangered or sensitive plants and their Federal status) USFWS, Sacramento
- Beckstrom-Sternberg, S.M. (1990). Evolutionary relationships of Fritillaria eastwoodiae (Liliaceae) based on enzyme electrophoresis. Rancho Santa Ana Botanic Garden, Claremont
- Bittman, R. (1991). Letter to Linnea Hanson, Plumas Forest Botanist, dated 2/26/91
- Hanson, L. (1991). Interim Management Prescriptions for the Sensitive and Special Interest Plant Species on the Plumas National Forest. Draft Revision dated 1/28/91. USDA Plumas NF, Quincy
- ____ (1989). Memo to D. Peters, Lands and Recreation Officer, Plumas NF, dated 7/25/89
- Macfarlane, R. M. (1978). On the taxonomic status of Fritillaria phaeantha Eastw. (Liliaceae). Madrono 25: 93-100
- ____ (1987). Letter to Linnea Hanson, Plumas Forest Botanist, dated 8/10/87
- Mistretta, O. (1990). Letter to Linnea Hanson dated 10/31/90 accompanying report on isozyme analysis done by Stephen M. Beckstrom-Sternberg. Rancho Santa Ana Botanic Garden, Claremont
- Nelson, J. (1979). Report on Rare and Endangered Species in the Proposed Volta 2 Project Area. Pacific Gas & Electric Co., Dept. of Engineering Research
- ____ (1981). Letter to Mike Fry, PG&E Biologist, dated 7/7/81
- Ness, B.B. (1991). Fritillaria. In: The Jepson Manual of Flowering Plants of California, p. 298-300. Draft of "Final Text" in prep. The Jepson Manual Project, Berkeley
- Oswald, V.H. and L. Ahart (1991). Manual of the Vascular Plants of Butte County, California. Dept. of Biological Sciences, California State University, Chico
- Santana, D.O. (1984). Morphological and Anatomical Observations on the Bulbs and Tepals of Fritillaria (Liliaceae) Section Liliorhiza (Kellogg) Watson, their Taxonomic Implications with a Synopsis and the Reproductive Biology of the Section. Department of Botany, University of California, Davis

Smith, J.P. Jr. and K. Berg (1988). Inventory of Rare and Endangered Vascular Plants of California. Special Publication No. 1 (4th Edition). California Native Plant Society, Sacramento

Taylor, D.W. (1990). Endangered Plant Survey for the PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon and California. BioSystems Analysis, Inc., Santa Cruz

USDA Forest Service, Pacific Southwest Region (1988). Plumas National Forest Land and Resource Management Plan ["LMP"]

(1988). Environmental Impact Statement [EIS] for the Plumas National Forest Land and Resource Management Plan

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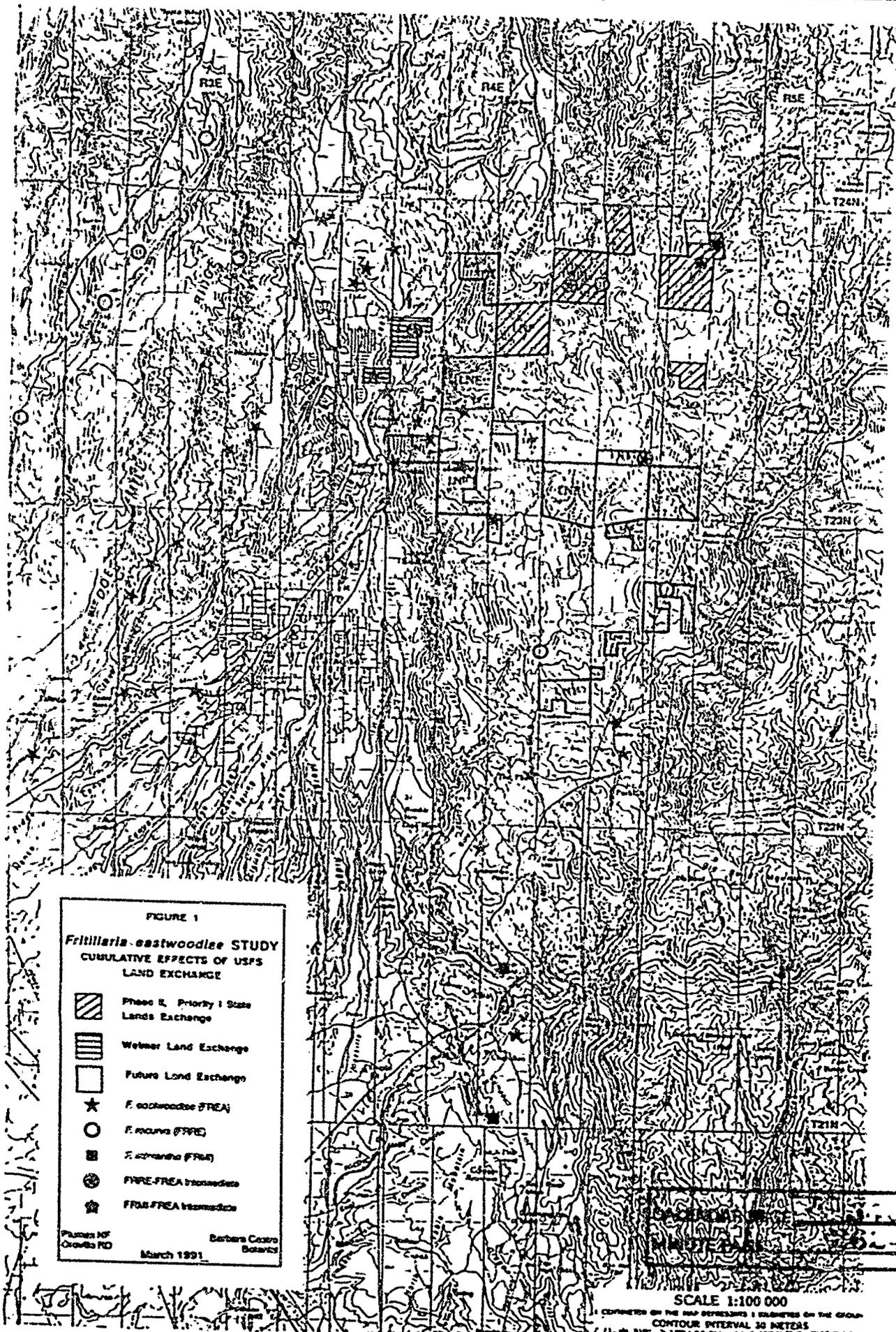


FIGURE 1
***Fritillaria eastwoodiae* STUDY**
 CUMULATIVE EFFECTS OF USFS
 LAND EXCHANGE

-  Phase II, Priority I State Lands Exchange
-  Weber Land Exchange
-  Future Land Exchange
-  *F. eximiosa* (FREA)
-  *F. recurva* (FRRE)
-  *F. schrenkii* (FRS)
-  FRRE-FREA Intermediate
-  FRS-FREA Intermediate

Plumas NF
 Oroville PD
 Barbera Castro
 Botanist
 March 1991



SCALE 1:100 000
 CONTOUR INTERVAL 20 METERS

FIGURE 2

Fritillaria eastwoodiae STUDY
SPECIES RANGE MAP

Based on maps, specimens, and other records from CDU Olive
County, Plumas NF, California Natural Diversity Data Base, Butte
County Flora Project files, Mt. Lassen-Casper Camp Natl. and
contributions of individuals, through 1988.



F. eastwoodiae (FREA)
Population center



FREA outlier occurrence

0 10mi

Plumas NF
Olive RID

Barbara Castro
Botanist

March 1991

