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Davis, California 95616

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Park Technician _____ Seasonal _____

Stephen D. Veirs, Jr. -- Unit Leader

Christine Schonewald-Cox -- CPSU Research Scientist

Charles R. Goldman -- UC Unit Coordinator

Thomas J. Stohlgren -- Ecologist

Sharon Lynch -- Administrative Assistant

Draft Technical Report

STATUS OF NATURAL RESOURCES DATABASES IN
NATIONAL PARKS: WESTERN REGION 1990

BY Thomas J. Stohlgren and James F. Quinn

Research Scientists

Gary E. Davis -- Channel Islands NP

Gary M. Fellers -- Pt. Reyes NS

David M. Graber -- Sequoia and Kings Canyon NP

William Halvorson -- Channel Islands NP

David J. Parsons -- Sequoia and Kings Canyon NP

Jan van Wagtendonk -- Yosemite NP

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Staffs of large parks tend to know more about their natural resources than those of smaller parks that have historically received less funding for research and resource management activities. We outline some strategic considerations needed rank I&M needs, standardize recording techniques, test model I&M systems in selected parks, and develop a framework to synthesize I&M information over large spatial and long temporal scales.

sp.), marine invertebrates (41 sp.), birds (23 sp.), marine algae (16 sp.), fishes (16 sp.) and mammals, reptiles and amphibians (12 sp.). Unfortunately, this type of program is unique.

There has been only one previous modern service-wide attempt to identify gaps in our knowledge of natural resources. The "Natural Resources Assessment and Action Program Report" (National Park Service 1988) sought to identify the status of information on external threats (e.g., air pollution, urbanization, non-native species invasion, etc.) to park ecosystems. Two major findings of the report included: (1) more parks have inadequate data to support management actions than have adequate information; and (2) the need for better monitoring was the second largest need documented in park resource management plans (behind mitigation needs). Thus, except for the I&M program at Channel Islands National Park, the status of existing data on natural resources in Western Region parks was poorly known.

As part of the service-wide initiative to inventory existing park data, we visited 40 Western Region park units and evaluated their natural resource databases. The primary objectives of the survey were to:

- (1) provide a qualitative assessment (categorical summary) of the status of species lists for various biological groups (vascular plants, mammals, birds, reptiles, amphibians, terrestrial invertebrates, aquatic invertebrates, and non-vascular plants);
- (2) inventory mapped information on vegetation, soils, geology and other natural resources; and
- (3) inventory image information such as photographic series, aerial and satellite imagery, and digitally processed information.

Information on maps (thematic and cartographic) and imagery (aerial and digital) was simply catalogued. Mapped information included map theme, date, investigator, and several other map characteristics (Table 2). The question was asked whether the map had been systematically field checked (after its development). Map "accuracy" was estimated by asking what percentage of 100 randomly located points would be correctly classified by the map. Additional information was recorded on map form, structure and repository. Information on imagery included type, scale, format, comprehensiveness and repository (Table 3).

RESULTS

Overview of the Status of Information on all Biological Groups

Ten or fewer parks of the 40 parks surveyed had composite scores of 3 for vascular plants, birds, and mammals (Figure 1). Thus, only a few parks reported their species' inventories were "probably complete" (i.e., assumed to be more than 95% complete) taxonomically, geographically and ecologically. The number of composite scores greater than 7-9 indicated that the species lists for mammals, reptiles, amphibians and fish were generally less than 50-80% complete. Most parks in the Western Region know more about vascular plants and birds than these other groups, but a surprisingly large number of parks had gaps in their knowledge (i.e., high composite scores) for these groups as well (Figure 1).

Wildlife reporting procedures were not standardized among parks and within parks over time (Sauvajot et al., 1990). Also, there has been disproportionate attention to some groups (plants, mammals, birds) and to taxa within groups (butterflies, trees, large mammals, etc.) while other "unpopular" groups (invertebrates, non-vascular plants) and difficult taxa (sedges, arachnids, fungi, etc.) have largely been ignored.

Lastly, it was clear that few, if any parks had developed a strategy to fill the information gaps. The status of existing data varied considerably among biological groups and parks (Appendix II). We now present selected examples and comments from our investigation of 40 park units and briefly identify region-wide needs (or park-specific needs where appropriate) to fill the information gap for each biological group.

Vascular Plants:

- * No park had completed a systematic survey of vascular plants.
- * Only 9 of 40 parks reported their vascular plant lists were probably taxonomically, geographically, and ecologically complete. In all cases, these were compiled from a synthesis of individual studies of varying quality and completeness.
- * 24 of 40 parks reported knowing < 80% of their vascular plants. The rate of discovery of unrecorded species in parks with active survey programs suggests that this is an underestimate.
- * Over the past 10 years even poorly funded inventory projects and localized research studies have added more than 1400 species to the plant list of the 40 parks: current plant lists can hardly be considered complete.
- * No park reported having a complete set of voucher specimens on site (most had incomplete sets with

Interviews with park staff showed a wide variety of problems and concerns about the status of vascular plant inventories in Western Region parks. Several parks were new to the system (KALA, GRBA, AMME, NASA) or have added new lands yet to be inventoried (CHIR, JOMU). Most of the parks complained about inadequate funding and staff to do "inventory work." Many parks lacked the physical space and staff to maintain an herbarium. One herbarium was described as "50? specimens were in a cardboard box in park, location unknown." And, most parks admitted that their plant lists are extremely tentative and needed to be checked by experts. Especially for Hawaiian and Californian parks where new taxonomic keys are available or are being developed, parks have great difficulty keeping up with taxonomic synonyms.

Inventory and monitoring needs for vascular plants in Western Region parks include:

- (1) systematic vegetation surveys in each park;
- (2) establishment or improvement of condition of park herbaria using the Automated National Catalog System;
- (3) expert checking of herbaria specimens for proper identification;
- (4) in-park personal computer-based, standardized software for easy entry to NPFLORA or an equivalent common database, editing and reporting - preferably dBASE-compatible software for ease of use and for inter-agency exchange of information (see Robinson et al., 1990);
- (5) a central "clearing house" (DSC) for handling taxonomic synonyms, duplicate voucher specimens and data exchange;
- (6) development of field techniques to assess the "completeness" of vascular plant lists (this is no small task).

distribution, population dynamics and behavior of non-native mammals and native bats than were mainland parks.

Sixteen of the 40 parks had no voucher specimens and most parks knew little about the number and location of previous collections or voucher specimens. Tuzigoot N.M., for example, reported:

"The park is using an old wildlife checklist for its mammals list. It lists 13 mammals. The author and date are unknown. The date is assumed to be 1940-50. There are no voucher specimens."

The I&M needs for mammals are nearly identical with those vascular plants (see above). Local museums or universities may be better suited for maintaining voucher specimens.

Birds:

- * No park had completed a systematic survey of birds (Table 6).
- * 18 of 40 parks reported having bird lists that were probably taxonomically complete.
- * Only 11 of 40 parks reported knowing less than 80% of the bird species in their parks.
- * Field and recording procedures for bird use or abundance were not standardized among parks, an inter-park comparison is impossible.
- * Over 100 new-to-park bird species were added to park lists during the past 10 years.

Parks generally had better presence-absence data on bird species than for the other biological groups (Figure 1, Table 6). However, Sauvajot et al., (1990) showed that in California's national parks no two parks reported bird use or abundance in the same way. This is probably the case for the 40 parks surveyed

This may be the only realistic solution to evaluating changes in migratory bird species.

Reptiles:

- * One systematic survey of reptiles has been completed in Santa Monica N.R.A. and there is one on-going study at Organ Pipe Cactus N.M.

- * Only 4 of 40 parks reported having complete species lists (Figure 2).

- * Over half the parks report their current species lists are taxonomically less than 50% complete.

Our best example of a reptile inventory comes from Santa Monica N.R.A. which conducted a systematic herpetological survey from 1981-86 that covered 50-80% of the park. Twenty-four species were found.

Several southwestern parks have rich reptile faunas including Death Valley N.M. (69 sp.), Saguaro N.M. (50 sp.), Grand Canyon N.P. (50 sp.), and Chiricahua N.M. (49 sp.). Yet even these areas have not received systematic surveys. Most southwestern parks report that systematic work would lead to new species for the area and range extensions. Many parks have relied on range maps and field guides to develop their species lists (e.g., PORE, CABR, CORO, GRBA, HAVO, HALE, PEFO). Many parks relied on casual observations although REDW reports having no "observation cards" for reptiles despite having hundreds of cards for mammals and birds although Redwood only has about 6 reptiles, 2 lizards, 2-3 snakes and 1 turtle. Obviously, some groups of animals are more commonly reported on observation cards than other groups of animals.

growth forests. More than half the parks have < 10 species. Nearly all our information on amphibians comes from range maps or casual observations with very little field work. Most parks feel their current species lists are inadequate. Casa Grande N.M. reported "No inventory has been completed ... photos of a few toads from 1941."

Similar to the inventory and monitoring needs for reptiles, a species-specific approach might be a higher priority than extensive surveys. Several parks in California (SEKI, YOSE, PINN, SAMO) suspect rapid declines in frog populations over the past 10 years. Potential causes for these declines include acid deposition and competition from deliberately introduced non-native fish. Haleakala N.P. reported three exotic amphibian species. Thus, studies on the population dynamics are urgently needed for these and other amphibian species of concern (e.g., Limestone salamander, Mt. Lyell salamander, Yosemite toad, red-legged frog and yellow-legged frog in YOSE; red-legged frog in SAMO). Since the ranges of many "special status" amphibians extend into several parks (e.g., red-legged frog in SAMO, YOSE and SEKI, yellow-legged frog in SEKI and YOSE, etc.), studies should be coordinated at the regional level.

A standardized method of handling voucher specimens is badly needed: only four parks had voucher specimens in the park.

have been observed since in yearly surveys.

Inventory and monitoring needs for fish may require a blend of extensive surveys and species-specific or site specific monitoring. Channel Islands, Kaloko-Honkahau, Kalaupapa, Puukohola Heiau, Pu'uhonua-O-Honaunau and Redwood require extensive surveys of marine (especially deep oceanic) aquatic resources.

Meanwhile, listed species like the pupfish at DEVA, tide-water goby steelhead trout and salmon at REDW, roundtail at GRCA and Colorado squawfish at Lake Mead need continued monitoring.

Terrestrial and Aquatic Invertebrates:

- * No park has attempted to conduct a systematic survey of all invertebrate groups.
- * Several parks reported studies of particular groups (e.g., arthropods, mollusks, butterflies, etc.).
- * Only five parks reported having taxonomically complete lists of particular groups of invertebrates.
- * Only four parks reported having studies or surveys of particular groups of invertebrates over the history of the park.
- * 30 of 40 parks and 24 of 40 parks report knowing less than 50% of their terrestrial and aquatic invertebrate species.

Very little is known about the biodiversity of terrestrial and aquatic invertebrates of park areas in the Western Region (Figure 3; Tables 10 and 11). Most of the available information comes from taxa-specific studies or collections. That is why summary Tables 10 and 11 list group-specific ratings. In a recent (1988) collection of beetles at Coronado N.M., for example, 80 specimens were collected including up to 20 species never before collected. Grand Canyon has had some good work done

Non-vascular Plants:

- * No park has conducted a systematic survey of all non-vascular plant groups.

- * Only 4 of 10 parks reported having taxonomically, geographically and ecologically complete lists of particular groups of non-vascular plants (Figure 3; Table 12).

- * Several parks reported studies of particular groups (e.g., lichens, fungi, bryophytes, algae) in small areas within the parks.

- * 29 of 40 parks reported knowing less than 50% of their non-vascular plant species.

Similar to invertebrates, park areas in Western Region generally know very little about the biodiversity of non-vascular plants. However, there are exceptions. Lassen Volcanic N.P. has had a fungi survey almost every year for the past 40 years. Petrified Forest N.P. has an on-going survey of lichens covering the entire park. Saguaro N.M. has benefitted from five surveys between 1908 and 1966 and has a collection of 250 specimens with 37 yet to be identified. Hawaiian parks have received attention from Dr. Cliff Smith, expert lichenologist and CPSU Unit Leader at the University of Hawaii. Dr. Smith has also conducted lichen surveys at Pinnacles N.M. and a preliminary survey at John Muir N.H.S. Parks with marine resources, notably Channel Islands N.P. and Pu'uhonua-O-Honaunua N.H.P. have some detailed information on algal populations, but these studies are generally confined to small areas.

Gaps in knowledge about non-vascular plants may be more serious than previously considered. Because they are bio-monitors for air pollution, systematic lichen monitoring could

for inventory and monitoring program; (2) identify parks above or below a yet-to-be-defined minimum standard (e.g., say 9); and (3) assess attainment of a minimum standard over time.

Status of Mapped Information:

- * 34 of 40 parks have vegetation maps, 21 of 40 parks have soils maps, and 26 of 40 parks have geology maps (Table 13).

- * 6 of the vegetation maps, 7 of the soils maps, and 9 of the geology maps cover areas smaller than the parks.

- * There has been no systematic check on any of the maps and many may be of questionable quality, accuracy or usefulness.

- * There has been no standardization of vegetation classification schemes among parks.

- * Many soils and geology maps vary in resolution (smallest map unit, intensity of ground-truth sampling, etc.)

With few exceptions, maps of natural resources in Western Region park areas tended to be poorly organized, rarely cover the entire park, are low in resolution, and have never been systematically field checked (Appendix III). No park had an existing list of mapped information. The Denver Service Center had conducted a detailed inventory of maps for Lake Mead N.R.A., but no additional information was provided LAME staff on base scale, investigators, data sources, field checks, map accuracy or map data. Many parks admitted maps were poorly maintained. Channel Islands N.P. reported "no one person has been responsible for keeping track of CHIS maps ... this is the worst map situation in the southern California parks." Point Reyes N.S. reported "map information is available, but in a state of disorganization; the map index is lost."

to current resource managers. A careful reexamination of the accuracy, resolution, and utility of existing maps is essential rather than blindly incorporating them into a developing GIS. Often, developing new maps from satellite imagery (e.g., SPOT) may be more accurate and cost effective than attempting to verify information on inaccurate old maps.

As stated above, many park units are developing GIS capabilities with little, if any, standardization among areas. In some cases, where the necessary mapped information is inaccurate or non-existent, this may be putting "the cart before the horse." The development of sound, ground-truthed, natural resource base maps may be a higher priority, albeit a more costly undertaking, than hardware and software purchases. This approach was successfully adopted in Sequoia and Kings Canyon N.P. Also, this approach would allow more time to develop a region-wide or service-wide framework for a consistent, coordinated effort to develop GIS capabilities in all parks with significant natural resources.

Status of Imagery Information:

- * Only 5 of 40 parks lacked some type of imagery (i.e., black and white, color, or color infrared aerial photography) (Table 14).

- * Three of the 34 parks with imagery did not have complete coverage of park lands.

- * Three park areas (YOSE, CHIS, GRBA) have incorporated satellite imagery into their GIS's.

Most parks have some type of imagery available for resource inventory purposes. Five parks (e.g., HAVO, REDW, HALE, LAVO, SAGU) have more than 10 sets of imagery, five parks have one set

One way to set priorities for inventory work may be to concentrate first on parks with scores of 6 or 7 (low information status) in "ecological completeness" for particular biological groups. This might provide the greatest return (i.e., discovery of new species) for the investment (funding and search time).

Although there is no sure-fire sampling design to assure managers their species lists are complete, this survey provides the information necessary to field-test current techniques used to measure species-area-search time relationships. When the number of new-to-park species decreases sharply as search time and area searched increases, the species list may be considered effectively complete. However, questions remain about appropriate sampling design for increasingly rare (i.e., temporally or spatially rare) elements on the landscape. Because this is a somewhat new problem for field biologists, an experimental approach should be used.

Species Extirpation:

- * Twenty-five species of vascular plants are reliably determined to be extirpated (in-park extinctions) in Western Region parks -- 24 species in Haleakala N.P. and one species in Golden Gate N.R.A. (Table 16).
- * Thirteen species of mammals are reported as nominally extirpated but this list includes 11 species that are found in lands adjacent to parks (i.e., they may have been only occasional users).
- * Six Hawaiian bird species are confirmed extirpated and 4 mainland species are now extirpated from parks.
- * The Colorado squawfish (GRCA) is the only fish extirpated from park waters.

going inventory and monitoring programs designed to track most threatened and endangered (T&E) species (Appendix V). Inventory and monitoring needs for extirpated, "possibly extinct" and T&E species should focus on habitat requirements and population dynamics (including analysis of birth and death rates, migration and immigration). External threats (non-native species invasion, non-native pathogens, air pollution and urbanization) and internal processes (habitat loss/degradation, habitat fragmentation, succession, etc.) must also be considered in the formulation of a long-term I&M strategy for rare species.

Perhaps an ideal inventory database, containing maps of the occurrences of each individual of each species at each point in time could address questions about campsite siting, backcountry use, or effects of global climate change with equal facility. Realizable databases are sure to be better suited to answer the management questions anticipated before data acquisition begins. For example, programs concentrating on population studies of large mammals may be relatively sensitive to effects of increasing backcountry use, but completely insensitive to effects of acid rain. Programs, such as that in SEKI, sampling vegetation on a predetermined grid are highly efficient in characterizing ecological communities on a geographic scale, but are inefficient at finding rare plant species (unless grid points happen to fall on unique microhabitats.) Programs centered on intensively monitoring selected populations and sites, exemplified by CHIS, are effective at detecting subtle local effects of long-term environmental change, at the expense of incomplete coverage of the full range of habitats and species represented in the park.

Such tradeoffs are inevitable. However the management consequences are hard to predict unless users of the data clearly articulate their information needs.

Completeness

In almost all cases, taxonomically complete inventories are unattainable. It may be possible in some cases to enumerate all the local species of groups where the number of species or the

California alone (F. Hrusa, pers. comm). Increasing numbers of new species are cryptic species -- those differentiated by genetic or biochemical differences rather than visible morphological traits. Since few parks can support floristic (or other systematics) experts, much less DNA labs, it is increasingly important that high quality outside taxonomic expertise (especially molecular taxonomy) be available to support in-park studies. Such support in turn requires properly prepared and curated study material -- currently a problem for most taxa in most parks.

Database Standardization

Inventory and monitoring studies throughout the National Park Service have been hampered by the lack of concrete guidelines for information acquisition and retrieval. Some standards could be easily set and implemented at modest cost. These include:

-- Taxonomic Nomenclature. Robinson et al., (1990) found that some 20% of the 6000+ vascular plant species reported from 19 parks in California represented different names for the same species. Standardized uses should be established, with computerized synonymy tables to convert lists from older studies. Once standardized, entries can typically be automatically updated to reflect new usages. (We should note, however, that reliably interpreting old lists often requires special expertise in the taxonomy of the group, and may necessitate reference to voucher

cost effective starting from scratch using the new technology than would be updating and verifying old paper maps of dubious origin and accuracy. We recommend that funds be sought for such a standardized mapping program for all parks, perhaps best supported by facilities and expertise in the regional office or CPSU.

-- Voucher Specimens and Other Biodiversity Documentation.

Few parks have adequate documentation of existing inventories (see Tables 4 to 12). Particularly with the increasing availability of molecular analyses, it is important that well-identified and properly stored biological materials be available to verify and update past analyses. It is even becoming increasingly feasible to use dried material to clone species or genetic types for reintroduction. Often, it is likely that particularly biological materials may be better deposited at regional museums or universities.

A surprising shortcoming in documentation in many parks is the lack of photographic files. Photographs can provide valuable (and taxonomically acceptable) documentation of the occurrence of many rare species, particularly vertebrates, which increasingly can neither legally nor morally be collected. Photographs can also provide extremely valuable reference materials for field identifications, especially by inexperienced personnel. A lending/copying library of photographic reference materials could be developed at modest cost.

vegetation, soil, fruitfall, and other physical characteristics are regularly measured from each. A similar approach on a much smaller scale has been taken on a kilometer grid in SEKI.

Design considerations for common-use protocols include such basic questions as:

- plot size and spacing
- which taxa are sampled?
- are all species counted, or are more intensive studies of target species emphasized?
- how are population sizes estimated?
- what physical factors (rainfall, soil characteristics, etc.) should be measured?
- if vegetation, soil, or other classifications are used, which classification scheme is appropriate?
- how should data be documented?
- how should the source and reliability of the data (for example, staff vs. visitor observation, or the experience and judgment of assistants) be evaluated and recorded?
- to what degree can or should protocols and databases be made compatible with those used by other agencies and conservation organizations?

We suggest that several small, intensive, workshops to evaluate some of these issues might more than pay for themselves in terms of better coordinating and targeting research dollars, and preventing expensive incompatibility problems later.

Participants should include scientists directing the more active I&M programs, several knowledgeable managers and academics, and representatives of other organizations (e.g., the Forest Service, the Nature Conservancy) involving in similar research programs.

in essentially a nested experimental design.

CONCLUSION

On one hand, the status of biological inventory information in many parks is unsatisfactory, reflecting a history of underfunding, low priority treatment, and a lack of clearly articulated goals. However the increasing national recognition of the importance of protecting biological diversity and the availability of new technological tools has created opportunities to identify and map biological resources and coordinate analysis and planning in a way never before possible. Doing so effectively will require explicit recognition that complete I&M databases are impossible to establish, so that priorities must be set early to best address the specific information needs of the major database users. Planning and analysis across multiple parks will require much greater standardization in nomenclature, computer technology, and sampling protocols than exist today. Nevertheless, it is essential to have some parks carry on much detailed programs than are feasible in most parks, both as pilot studies for establishing future standards, and as means of evaluating the uncertainties and risks inherent in applying incomplete ecological data to pressing problems in environmental management.

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- Asterisks indicate no fish in park.
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Table 1 (continued). Biological Inventory Status Codes

SEASONAL COMPLETENESS:

1. inventory has been completed over all appropriate seasons, in the park for this biological group
2. inventory has been completed in some of the appropriate seasons, ...
3. inventory has been completed in only one of the appropriate seasons of the year, ...
4. collection has been sporadic with no season being inventoried well, ...
5. status of seasonal completeness in inventory is unknown, ...
6. N/A

HISTORY OF INVENTORY:

1. inventory/observations have been ongoing over the history of the park
2. inventory/observations have been ongoing over the last 10-20 years
3. inventory/observations have been ongoing over the last 5-10 years
4. inventory/observations have been ongoing over the last 5 years
5. inventory/observations have occurred more than once
6. inventory/observations have occurred only once
7. inventory/observations have never occurred
8. inventory/observations status is unknown
9. scattered observations over time

REFERENCES FOR THIS BIOLOGICAL GROUP IN PARK: (Provide author and date citations for references used to complete this particular record, although park/region may want to record full citation)

INVENTORY DATE: (YEAR e.g., 1966)

DOCUMENT DATE: (YEAR of checklist or report)

VOUCHER SPECIMENS: (enter number of voucher specimens in park)

VALIDITY OF INVENTORY STATUS:

NUMBER OF SPECIES

How many species are listed on the park's checklist for this biological group? (specify the number, enter 9999 if unknown)

NUMBER OF SPECIES CHECKED BY EXPERTS

NUMBER OF SPECIES CHECKED BY STAFF

NUMBER OF SPECIES UNCONFIRMED

Comments: _____

Table 2. Codes for Mapped Information

PARK NAME: (list four letter code, e.g., SHEN for Shenandoah NP)

MAP THEME: (list theme, e.g., vegetation, landuse, DEM, DLG, etc.)

DATE: (specify year)

INVESTIGATOR: (surname)

BASE SCALE: (specify actual base scale)

DATA SOURCE:

1. aerial photos
2. satellite
3. field reconnaissance (i.e., not using standard cartographic methods)
4. derived from other mapped themes
5. other agency data (e.g., SCS, USGS, FWS, etc.)
6. unknown/uncertain

GEO-REFERENCED:

1. yes
2. no
3. unknown/uncertain

CLASSIFICATION SCHEME: (list type)

NUMBER OF CLASSES: (enter number of classes)

MINIMUM MAPPING UNIT: (enter smallest features recorded [area] or -1 for N/A or -9 for unknown/uncertain)

FIELD CHECKED:

1. spot checks
2. systematic check
3. unknown

ACCURACY: (enter % accuracy, -1 for N/A, -9 for unknown)

COMPREHENSIVENESS:

1. park and environs
2. park only
3. smaller than park

Table 3. Codes for Imagery Information

PARK NAME: (list four letter code, e.g., SHEN for Shenandoah NP)

IMAGERY: (describe imagery, e.g., aerial photo, satellite, etc.)

DATE: (specify year)

TYPE:

1. black and white
2. color
3. color infrared
4. LANDSAT/MSS
5. LANDSAT/TM
6. SPOT/MSS
7. SPOT/PAN
8. other
9. not applicable

SCALE: (actual)

FORMAT:

1. digital
2. analog
3. digital and analog

COMPREHENSIVENESS:

1. park and environs
2. park only
3. smaller than park

REPOSITORY:

1. park
2. region
3. GIS Division - WASO
4. DSC - TIC
5. USGS - EROS Data Center
6. university
7. other
8. unknown/uncertain

BACKUP COPIES:

1. park
2. region
3. GISD - WASO
4. DSC - TIC
5. USGS - EROS Data Center
6. university
7. other
8. no duplicate copies exist
9. unknown/uncertain

TABLE 5. STATUS OF MAMMALS DATA

PARK	STATE	TAXA COMPL	GEOG COMPL	ECOL COMPL	COMPOS SCORE	SEAS COMPL	NO. SPP	NO. VOUCHERS
Channl Islnd-pinnipd	CA	1	1	1	3	1	6	0
Channl Islnd-cetacean	CA	1	1	1	3	1	30	0
Channel Islands NP	CA	1	1	1	3	1	64	0
Haleakala NP	HA	1	1	1	3	1	11	0
Lava Beds NP	CA	1	1	1	3	1	38	196
Santa Monica Mt. NRA	CA	1	1	1	3	1	51	
Lassen Volcanic NP	CA	1	3	1	5	1	63	
Organ Pipe Cactus NM	AZ	1	3	1	5	1	48	32
Chiricahua NM	AZ	2	2	2	6	5	71	16
Death Valley - T&E	CA	1	3	2	6	6	69	
NP of American Samoa		2	2	2	6	1	9	0
Tonto NM	AZ	2	2	2	6	2	28	14
War in Pacific NHP	GU	2	2	2	6	2	3	0
Grand Canyon NP	AZ	1	5	1	7	4	88	
Joshua Tree NM	CA	2	3	2	7	4	46	
Lake Mead NRA	NV	1	3	3	7	1	72	
Yosemite NP	CA	2	4	1	7	3	79	620
Channel Islands-land	CA	2	3	3	8	2	20	0
Channel Islands NP	CA	3	3	2	8	2	3	0
Channel Islands NP	CA	3	3	2	8	2	3	0
Fort Bowie NHS	AZ	3	2	3	8	1	47	
Pinnacles NM	CA	1	4	3	8	1	38	15
Redwood NP	CA	2	3	3	8	2	39	
Sequoia/Kings NP	CA	1	2	5	8	1	90	20
Channel Islands-bats	CA	1	4	4	9	2	8	0
Coronado N Mem'l.	AZ	3	3	3	9	4	60	0
Death Valley NM	CA	3	4	2	9	2	51	413
Puukohola Heiau NHS	HA	3	3	3	9	3	10	0
Saguaro NM	AZ	2	4	4	10	5	66	72
HA Volc-endang. vert	HA	1	5	5	11	4	1	5
Hawaii Volcanoes NP	HA	1	5	5	11	2	9	4
Kaloko-Honokohau NHP	HA	1	5	5	11	4	16	0
Kalaupapa NHP	HA	1	5	5	11	5	10	0
Point Reyes N Sea.	CA	1	5	5	11	4	81	11
Cabrillo NM	CA	1	5	6	12	2	11	0
Golden Gate NRA	CA	4	4	4	12	2	100	
Great Basin NP	NV	3	5	5	13	5	50	
Petrified Forest NP	AZ	4	4	5	13	4	48	26
Walnut Canyon NM	AZ	4	5	5	14	5	52	51
American Mem'l. Pk.	HA	6	5	5	16	5		0
Muir Woods NM	CA	6	5	5	16	4	26	
Pu'uhon. Honaunau HP	HA	6	5	5	16	5	8	0
Whisk-Shas-Trin NRA	CA	6	5	5	16	6		
Casa Grande NM	AZ	6	6	6	18	6	3	
John Muir NHS	CA	6	6	6	18	5		
Montezuma Castle NM	AZ	7	5	6	18	5	37	
USS AZ & Prl Hbr NHL	HA	6	6	6	18	5		
Tuzigoot NM	AZ	7	6	6	19	6	13	0

TABLE 7. STATUS OF REPTILES DATA

PARK	STATE	TAXA COMPL	GEOG COMPL	ECOL COMPL	COMPOS SCORE	SEAS COMPL	NO. SPP	NO. VOUCHERS
Kal.Hono.NHP-Marine	HA	1	1	1	3	6	2	0
Lava Beds NP	CA	1	1	1	3	1	6	11
NASA -amphibs/reptle		1	1	1	3	1	15	0
Sequoia/Kings NP	CA	1	1	1	3	1	25	2
Joshua Tree NM	CA	1	2	1	4	2	37	
Yosemite NP	CA	1	2	1	4	1	22	202
Channel Islands NP	CA	1	2	2	5	1	7	0
Organ Pipe Cactus NM	AZ	1	3	1	5	1	43	38
Death Valley -T&E	CA	1	3	2	6	6	69	
Pu'uho. Honaunau HP	HA	2	2	2	6	5	6	0
Saguaro NM	AZ	2	2	2	6	1	50	
Santa Monica Mt. NRA	CA	1	3	2	6	1	24	
Tonto NM	AZ	2	2	2	6	1	32	0
Fort Bowie NHS	AZ	2	2	3	7	6	26	
Grand Canyon NP	AZ	3	2	2	7	2	50	15
Haleakala NP	HA	1	3	3	7	2	5	0
Lake Mead NRA	NV	1	3	3	7	1	41	
Montezuma Castle NM	AZ	2	3	2	7	2	32	
Pinnacles NM	CA	2	4	2	8	1	22	5
Hawaii Volcanoes NP	HA	1	5	5	11	4	1	5
HA Volcanoes-marine	HA	1	5	5	11	4	2	0
Point Reyes N Sea.	CA	1	5	5	11	4	15	0
Cabrillo-envcons rep	CA	1	6	6	13	2	5	0
Chiricahua NM	AZ	2	6	6	14	5	49	19
Coronado N Mem'l.	AZ	4	4	6	14	3	22	0
Golden Gate NRA	CA	6	4	4	14	2	22	
Petrified Forest NP	AZ	4	5	5	14	5	15	0
Cabrillo-reptiles	CA	7	4	4	15	3	6	0
Lassen Volcanic NP	CA	3	6	6	15	6	9	0
Great Basin NP	NV	6	5	5	16	4	19	
Grt Basin-rept/amphb	NV	6	5	5	16	5	20	
HA Volc. NP -Terrest	HA	6	5	5	16	5	7	0
Muir Woods NM	CA	6	5	5	16	4	11	
Puukohola Heiau NHS	HA	6	5	5	16	4	8	0
Death Valley NM	CA	7	5	5	17	4	36	0
Kaloko-Hono -terrest	HA	6	6	5	17	8	0	0
American Mem'l. Pk.	HA	6	6	6	18	5		0
Casa Grande NM	AZ	6	6	6	18	6		0
John Muir NHS	CA	6	6	6	18	5		0
USS AZ & Prl Hbr NHL	HA	6	6	6	18	6		
Walnut Canyon NM	AZ	6	6	6	18	5		0
War in Pacific NHP	GU	6	6	6	18	6		
Kalaupapa NHP	HA	7	6	6	19	5	6	0
Redwood NP	CA	7	6	6	19	5		
Tuzigoot NM	AZ	7	6	6	19	6	6	0
Whisk-Shas-Trin NRA	CA	7	6	6	19	5		

TABLE 9. STATUS OF FISH DATA

PARK	STATE	TAXA COMPL	GEOG COMPL	ECOL COMPL	COMPOS SCORE	SEAS COMPL	NO. SPP	NO. VOUCHERS
Casa Grande NM	AZ	0	0	0	0	0	0	0
Chiricahua NM	AZ	0	0	0	0	0	0	0
Coronado N Mem'l.	AZ	0	0	0	0	0	0	0
Fort Bowie NHS	AZ	0	0	0	0	0	0	0
John Muir NHS	CA	0	0	0	0	0	0	0
Lava Beds NP	CA	0	0	0	0	1	1	1
Petrified Forest NP	AZ	0	0	0	0	0	0	0
Saguaro NM	AZ	0	0	0	0	0	0	0
Tonto NM	AZ	0	0	0	0	0	0	0
Walnut Canyon NM	AZ	0	0	0	0	0	0	0
Channel Isd-kelp for	CA	1	1	1	3	3	107	0
Death Valley NM	CA	1	1	1	3	1	6	5
Grand Canyon NP	AZ	1	1	1	3	6	20	150
Lake Mead NRA	NV	1	1	1	3	1	22	
Muir Woods NM	CA	1	1	1	3	2	3	0
Organ Pipe Cactus NM	AZ	1	1	1	3	1	1	1
Sequoia/Kings NP	CA	1	1	1	3	1	12	0
USS AZ & Prl Hbr NHL	HA	1	1	1	3	6	25	0
Yosemite NP	CA	1	1	1	3	1	10	39
Redwood NP	CA	1	2	1	4	1	16	500
Death Valley-T&E spp	CA	1	3	2	6	6	69	
Point Reyes N Sea.	CA	1	1	4	6	2	17	
Puukohola Heiau NHS	HA	2	2	2	6	6	63	0
Pu'uhon. Honaunau HP	HA	2	2	2	6	5	121	0
Kaloko-Honokohau NHP	HA	3	2	2	7	6	166	0
Chnnl Isld-rock intd	CA	3	3	2	8	2	7	0
Channel Islands NP	CA	3	3	2	8	1	138	0
Lassen Volcanic NP	CA	3	3	3	9	6	12	
Haleakala NP	HA	3	4	3	10	4	4	0
Montezuma Castle NM	AZ	3	4	3	10	5	10	0
Pinnacles NM	CA	1	5	5	11	4	2	1
Golden Gate NRA	CA	5	4	5	14	2		
Hawaii Volcanoes NP	HA	6	5	5	16	6	7	0
American Mem'l. Pk.	HA	6	6	6	18	5		
Cabrillo NM	CA	6	6	6	18	5		
Joshua Tree NP	CA	6	6	6	18	5		
Kalaupapa NHP	HA	6	6	6	18	5		
Santa Monica Mtn NRA	CA	6	6	6	18	5		
Great Basin NP	NV	7	6	6	19	5		
NP of American Samoa		7	6	6	19	6		
Tuzigoot NM	AZ	7	6	6	19	6	89	0
War in Pacific NHP	GU	7	6	6	19	5		
Whisk-Shas-Trin NRA	CA	7	6	6	19	5		

PARK	STATE	TABLE 11. STATUS OF AQUATIC INVERTEBRATES DATA					NO. SPP	NO. VOUCHERS
		TAXA COMPL	GEOG COMPL	ECOL COMPL	COMPOS SCORE	SEAS COMPL		
Casa Grande NM	AZ	0	0	0	0	0	0	0
Fort Bowie NHS	AZ	0	0	0	0	0	0	0
Petrified Forest NP	AZ	0	0	0	0	0	0	0
Channel Isld-kelp	CA	1	1	1	3	3	455	0
USS AZ/Prl Hbr-spong	HA	1	1	1	3	6	12	0
USAR-Coelenterates	HA	1	1	1	3	6	3	0
USAR-Molluscs	HA	1	1	1	3	6	6	0
USAR-Urochordata	HA	1	1	1	3	6	6	0
USAR-Ectoprocta	HA	1	1	1	3	6	1	0
Redwood NP	CA	1	2	1	4	1	1000	
Montezuma Castle NM	AZ	1	3	2	6	1	57	0
Chnl Is-sand intrtid	CA	1	4	2	7	2	30	0
Chnl Is-rock intrtid	CA	3	3	2	8	2	110	0
Kalo.-Hono -marine	HA	2	3	3	8	6	33	0
Puho - Coelenterates	HA	3	3	2	8	2	5	0
Puho-sponges	HA	3	3	2	8	2	2	0
Puho-Bryozoa	HA	3	3	2	8	2	1	0
Puho-Echinodermata	HA	3	3	2	8	2	18	0
Puho-Molluscs	HA	3	3	2	8	2	46	0
Cabrillo-intertidal	CA	2	3	4	9	2	160	
Channel Isld-marine	CA	3	3	3	9	1	500	0
Hale-Platyhelminthes	HA	3	3	3	9	2	2	
Haleakala - molluscs	HA	3	3	3	9	2	47	0
Haleakala NP-sponges	HA	3	3	3	9	2	1	
Organ Pipe Cactus NM	AZ	5	3	1	9	2	61	0
Joshua Tree-arthropd	CA	5	3	3	11	5	327	
Sequoia/Kings-insect	CA	4	4	4	12	1	709	300
Lassen Volcanic NP	CA	5	4	4	13	5		
Yosemite NP	CA	5	5	5	15	4	4500	
Golden Gate NRA	CA	6	5	5	16	4	1	
Lava Beds NP	CA	6	5	5	16	4		
Muir Woods NM	CA	6	5	5	16	4	1	
American Mem'l. Pk.	HA	6	6	6	18	5		
Chiricahua NM	AZ	6	6	6	18	6		
Coronado N Mem'l.	AZ	6	6	6	18	5		
Grand Canyon NP	AZ	6	6	6	18	5		
Point Reyes N Sea.	CA	6	6	6	18	5		
Saguaro NM	AZ	6	6	6	18	6		
Tonto NM	AZ	6	6	6	18	5		
Tuzigoot NM	AZ	6	6	6	18	6		
Walnut Canyon NM	AZ	6	6	6	18	6		
War in Pacific NHP	GU	6	6	6	18	6		
Cabrillo -intertidal	CA	7	6	6	19	5	30	
Great Basin-zooplnkt	NV	7	6	6	19	5		
Hawaii Volcanoes NP	HA	7	6	6	19	6		
John Muir NHS	CA	7	6	6	19	5		
Kalaupapa NHP	HA	7	6	6	19	6		
NP of American Samoa		7	6	6	19	6		
Pinnacles NM	CA	7	6	6	19	5		
Puukohola Heiau NHS	HA	7	6	6	19	6		
Whisk-Shas-Trin NRA	CA	7	6	6	19	5		

TABLE 12 CONTINUED. STATUS OF FUNGI, LICHEN, ALGAE AND MOSSES DATA

PARK	STATE	TAXA COMPL	GEOG COMPL	ECOL COMPL	COMPOS SCORE	SEAS COMPL	NO. SPP	NO. VOUCHERS
Kal-Hon. NHP-bryophy	HA	6	6	6	18	6	1	0
Org Pipe Cac NM-fung	AZ	6	6	6	18	5		0
Pet.For. NP-lichens	AZ	6	6	6	18	6		
Pet.For. NP-fungi	AZ	6	6	6	18	6		0
Puuk. Heiau NHS-bryo	HA	6	6	6	18	6	1	0
Puuk. Heiau NHS-fung	HA	6	6	6	18	6	1	0
Saguaro NM-fungi	AZ	6	6	6	18	6		0
Tonto NM-lichens	AZ	6	6	6	18	5		10
Tonto NM-fungi	AZ	6	6	6	18	6		0
Tuzigoot NM-fungi	AZ	6	6	6	18	6		0
Tuzigoot NM-lichens	AZ	6	6	6	18	6		0
Walnut Can NM-lichen	AZ	6	6	6	18	6		0
Walnut Can NM-fungi	AZ	6	6	6	18	6		0
War in Pac NHP-lich	GU	6	6	6	18	6	7	0
Lassen Vol NP-lichen	CA	7	6	6	19	6	25	
Pt Reyes N Sea.-fung	CA	7	6	6	19	5		
Pt Reyes N Sea.-lich	CA	7	6	6	19	5		
Chiricahua NM-lichen	AZ	7	6	6	19	6		84
Grand Canyon NP-fung	AZ	7	6	6	19	5		

TABLE 14. STATUS OF IMAGERY INFORMATION

	YEAR			COMPREHENSIVENESS				NUMBER OF SETS (PAST YEARS)				OTHER IMAGERY
	B&W	COLOR	COLOR IR	B&W	COLOR	COLOR	IR	B&W	COLOR	COLOR	IR	
AMME		1987			1							
CABR	1981	1982	1982	1	1	1		1				
CAGR	1976			1				3				
CHIR	1979			3				4				
CHIS		1988	1988		3	3				8		SATELLITE-1 ONE LANDSAT/TM
CORO												
DEVA	1982		1983	3		3		3				SATELLITE-3
FOBO	1965			3								
GOGA	1987											
GRBA	1972	1984	UNKNOWN	0	2	1		1				
GRCA												
HALE	1983	1978	UNKNOWN	1	1	1		14	7			
HAVO	1977	1979	UNKNOWN	3	3	1		85	2	4		OTHER-6
JOMU	NONE	IN THE	PARK									
JOTR	1970	1990		1	3					3		OTHER-1
KAHO	1988	1990	1988	2	2	1		6		1		
KALA	1990	1983	1990	1	1	1		8	1			
LABE	1975	1974	1978	3	2	1		3		1		BW-SERIES OF 17
LAME	1982	1979	1976	3	3	3		2				
LAVO	1981	1978	1988	3	3	3		16	1			
MOCA	1946	1987		2	1			5				
MUWO		UNKNOWN			3							
NASA			1990			3						
ORPI	1988	1984	1984	0	3	3		10	2	2		
PEFO	1986	1976		1	1			4	1			
PINN	1979		1983	2		2		1				
PORE	1965	1974	1984	0	0	2		7	1			
PUHE	1983		1974	1		1		1		1		
PUHO		1982			1							
REDW	1988	1981	1983	3	3	2		32	7	4		
SAGU	1986	1975		1	3			14				
SAMO	1977	1988	1984	3	1	1				1		LANDSAT/TM-3
SEKI	1989			1				1				
TONT	1967			1								
TUZI		1987			1				2			
USAR												
WACA												
WAPA												
WHIS	1985	1988		3	2			7	1			ONE OTHER
YOSE	UNKNOWN		1982	2		2		1				

TABLE 16. SPECIES EXTIRPATIONS IN PARKS

CORONADO NATIONAL MONUMENT:

Mammals:

POSSIBLE EXTIRPATION:

1. Mexican Lobo

DEATH VALLEY NATIONAL MONUMENT:

Vascular Plants:

POSSIBLE EXTIRPATION:

1. *Centaureum nanophilum* spp. *nanophilum* - Spring Loving Century Plan

GOLDEN GATE NATIONAL RECREATION AREA:

Vascular Plants:

CONFIRMED EXTIRPATION:

1. Dune Tansy - *Tanacetum camphoratum*

GRAND CANYON NATIONAL PARK:

Fish:

CONFIRMED EXTIRPATION:

1. Colorado Squaw Fish

POSSIBLE EXTIRPATION:

1. Round Tail

Mammals:

CONFIRMED EXTIRPATION:

1. Wolf
2. River Otter - *Lutra canadensis sonora*

POSSIBLE EXTIRPATION:

1. Prairie Dog
2. Badger
3. Raccoon

HALEAKALA NATIONAL PARK:

Vascular Plants:

CONFIRMED EXTIRPATION WITH DATE OF LAST SIGHTING:

1. *Cyanea longissima* (1927)
2. *Cyanea pohakys* (1919)
3. *Huperzia halakalae* (1841)
4. *Schiedea implexa* (1910)
5. *Silene cryptopetala* (1870s)
6. *Silene degeneri* (1927)
7. *Stenogyne haliakalae* (1937)
8. *Tetramolopium lepidotum* subsp. *arbusculum* (1841)

TABLE 16 CONTINUED. SPECIES EXTIRPATIONS IN PARKS

HAWAII VOLCANOES NATIONAL PARK:

Vascular Plants:

POSSIBLE EXTIRPATION:

1. Clermontia peleana Rock
2. Crytandra ramosissima Rock
3. Neraudia ovata Gaud.
4. Nototrichium sandwichiensis (Gray) Hbd.
5. Ochrosia kilaueaensis St. John
6. Ophioglossum concinnum
7. Panicum colleii Endl.
8. Portulaca hawaiiensis Deg.
9. Spermodermis hawaiiensis Wolff
10. Stenogyne angustifolia Gray var. salicifolia Sherff
11. Stenogyne kaalae Wawra var. coriacea Deg & Sherff
12. Stenogyne sessilis Benth.
13. Zanthoxylum hawaiiensis Hbd. var. velutinosum Rock
14. Zanthoxylum maviense Man. var. anceps Rock

Birds:

CONFIRMED EXTIRPATION:

1. Corvus hawaiiensis (HAWAII CROW OR 'ALALA)
2. Moho nobilis (O'O)
3. Hemignathus munrois ('AKIAPOLA'AU)
4. Oreomystis mana (HAWAIIAN CREEPER)
5. Loxops coccineus (HAWAII 'AKEPA)

POSSIBLE EXTIRPATION:

1. Ciridops anna (ULA-AI-HAWANE)
2. Drepanis pacifica (HAWAII MAMO)
3. Hemignathus obscurus (AKIALOA)
4. Chaetoptila angustipluma (KIOEA)
5. Psittirostra psittacea (OU)

JOHN MUIR NATIONAL HISTORIC SITE:

Birds:

CONFIRMED EXTIRPATION:

1. Great Blue Heron

Mammals:

CONFIRMED EXTIRPATION:

1. Grizzly Bear
2. Tule Elk

POSSIBLE EXTIRPATION:

1. Mountain Lion

JOSHUA TREE NATIONAL MONUMENT:

Birds:

POSSIBLE EXTIRPATION:

1. Chukar
2. Elf Owl

TABLE 16 CONTINUED. SPECIES EXTIRPATIONS IN PARKS

PETRIFIED FOREST NATIONAL PARK:

Mammals:

CONFIRMED EXTIRPATION:

1. Black Bear - *Ursus americanus*
2. Black Footed Ferret - *Mustela nigripes*
3. Gray Wolf - *Canis lupis*

PINNACLES NATIONAL MONUMENT:

Birds:

CONFIRMED EXTIRPATION:

1. Peregrine Falcon
2. California Condor

Mammals:

CONFIRMED EXTIRPATION:

1. Black Bear

Amphibians:

POSSIBLE EXTIRPATION:

1. Yellow Legged Frog

REDWOOD NATIONAL PARK:

Vascular Plants:

POSSIBLE EXTIRPATION:

1. Liliuim spp.

Birds:

CONFIRMED EXTIRPATION:

1. California Condor
2. Peregrine Falcon
3. Golden Eagle

Mammals:

CONFIRMED EXTIRPATION:

1. Grizzly Bear
2. Sea Otter
3. Sperm Whale

Fish:

POSSIBLE EXTIRPATION:

1. Candlefish

SANTA MONICA NATIONAL RECREATION AREA:

Reptiles:

POSSIBLE EXTIRPATION:

1. California Red Sided Garter Snake
2. California Lyre Snake

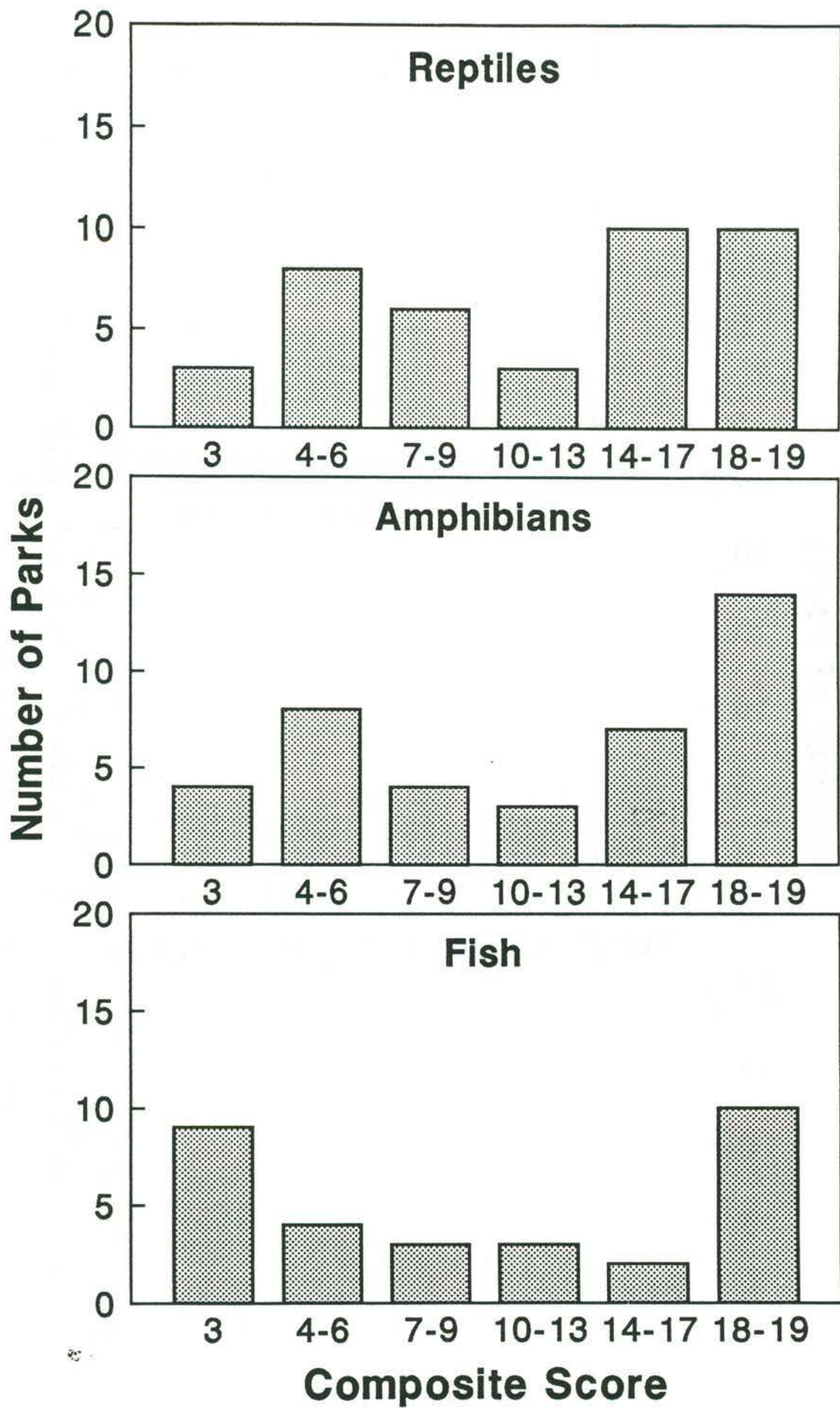
Amphibians:

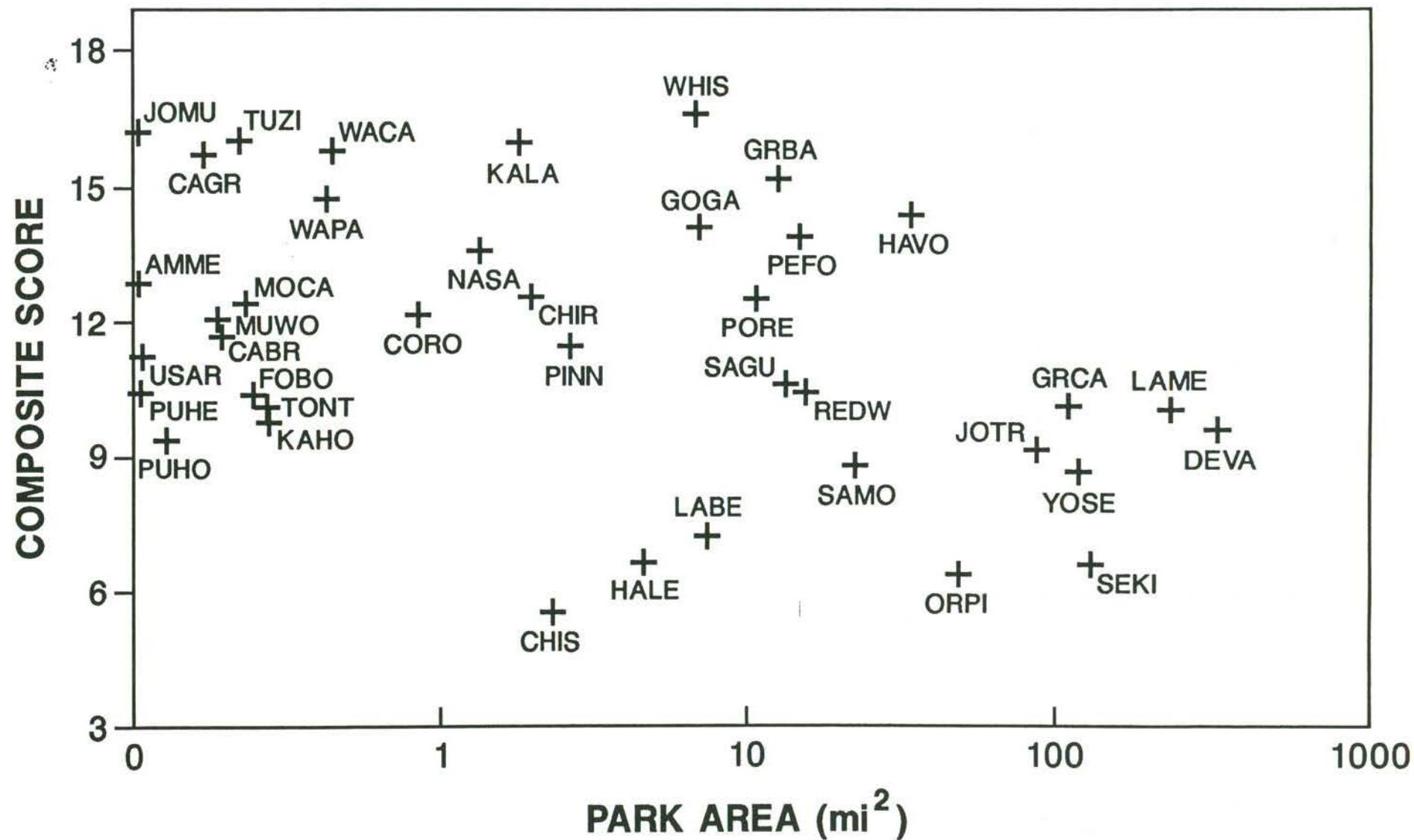
POSSIBLE EXTIRPATION:

1. Red Frog

LIST OF FIGURES

- Figure 1. Composite scores (taxonomic + geographical + ecological completeness) for vascular plants, mammals and birds in Western Region park areas.
- Figure 2. Composite scores (taxonomic + geographical + ecological completeness) for vascular plants, mammals and birds in Western Region park areas except for reptiles, amphibians and fish.
- Figure 3. Composite scores (taxonomic + geographical + ecological completeness) for vascular plants, mammals and birds in Western Region park areas except for terrestrial and aquatic invertebrates, and lichens, moss, fungi, etc.
- Figure 4. Relationship of park size (log scale) to mean composite score for the nine biological groups.





APPENDIX I. LIST OF PARK CODES

PARK CODE	PARK NAME	STATE
AMME	American Memorial NP	HA
CABR	Cabrillo NM	CA
CAGR	Casa Grande NM	AZ
CHIR	Chiricahua NM	AZ
CHIS	Channel Islands NM	CA
CORO	Coronado N Memorial	AZ
DEVA	Death Valley NM	CA
FOBO	Fort Bowie NHS	AZ
GOGA	Golden Gate NRA	CA
GRBA	Great Basin NP	NV
GRCA	Grand Canyon NP	AZ
HALE	Haleakala NP	HA
HAVO	Hawaii Volcanoes NP	HA
JOMU	John Muir NHS	CA
JOTR	Joshua Tree NM	CA
KAHO	Kaloko-Honokohau NHP	HA
KALA	Kalaupapa NHP	HA
LABE	Lava Beds NP	CA
LAME	Lake Mead NRA	NV
LAVO	Lassen Volcanic NP	CA
MOCA	Montezuma Castle NM	AZ
MUWO	Muir Woods NM	CA
NASA	NP of American Samoa	
ORPI	Organ Pipe Cactus NM	AZ
PEFO	Petrified Forest NP	AZ
PINN	Pinnacles NM	CA
PORE	Point Reyes N Sea.	CA
PUHE	Puukohola Heiau NHS	HA
PUHO	Pu'uhonua O Honaunau HP	HA
REDW	Redwood NP	CA
SAGU	Saguaro NM	AZ
SAMO	Santa Monica Mt. NRA	CA
SEKI	Sequoia & Kings Canyon NP	CA
TONT	Tonto NM	AZ
TUZI	Tuzigoot NM	AZ
USAR	USS Arizona & Pearl Harbor NHL	HA
WACA	Walnut Canyon NM	AZ
WAPA	War in Pacific NHP	GU
WHIS	Whiskey-Shasta-Trinity NRA	CA
YOSE	Yosemite NP	CA

APPENDIX II CONTINUED

PARK BIOLOGICAL GROUP CODE	TAX COMP	GEO COMP	ECO COMP	SEAS COMP	INV HIST	INV YEAR	DOC YEAR	NUMB VOUCH	NUMB SPEC	EXP CHK	STAF CHK	UNCON- FIRM	NEW SP 10 YR	NEW SP CL	MIS ID	CONF EXT	POSS EXT
CHIR AQUATIC INVERTS	6	6	6	6	7											0	0
CHIR BIRDS	2	2	2	5	9		1989	30	207							0	0
CHIR FUNGI	5	6	6	5	6		1980		0		0					0	0
CHIR LICHENS	7	6	6	6	6	1973		84		84	0	0				0	0
CHIR MAMMALS	2	2	2	5	5	1979	1980	16	71							0	0
CHIR REPTILES	2	6	6	5	8		1975	19	49							0	0
CHIR TERRESTRIAL INVERTS	6	6	6	5	7			625		0	0	0				0	0
CHIR VASCULAR PLANTS	2	2	3	1	5	1976	1990	2000	700		0	0	20		0	0	0
CHIS AMPHIBIANS	1	2	2	2	2		1967		3	3	3	0		0	0	0	0
CHIS BATS	1	4	4	2	5		1980	0	8				3		0	0	0
CHIS BIRDS	1	1	1	1	1		1989	0	315						0	0	0
CHIS CETACEANS	1	1	1	1	2		1987	0	30	30					0	0	0
CHIS KELP FOREST SPP-MAMM	3	3	2	2	3	1986	1988	0	3	3	3				0	0	0
CHIS KELP FOREST-AQINVERT	1	1	1	3	1	1986	1988	0	455						0	0	0
CHIS KELP FOREST/ALGAE	1	1	1	3	1	1986	1988	0	214	214					0	0	0
CHIS LAND MAMMALS	2	3	3	2	2		1967	0	20	20	20	1	0		0	0	2
CHIS MAMMALS	1	1	1	1	1			0	64	64					0	0	0
CHIS MARINE INVERTS	3	3	3	1	1	TEXT	1982	0	500	500	500				0	0	0
CHIS NONVASCULAR PLANTS	3	3	3	1	1	TEXT	1982	0	350	350					0	0	0
CHIS PINNIPEDS	1	1	1	1	4		1988	0	6	6	6	0	0		0	0	0
CHIS REPTILES	1	2	2	1	2	1967	1980	0	7	7	7	0	0		0	0	0
CHIS ROCKY INT.TIDAL-BIRD	3	3	2	2	3		1989	0	19		19				0	0	0
CHIS ROCKY INTERTIDAL-MAM	3	3	2	2	3		1989	0	3	3	3				0	0	0
CHIS ROCKY INTIDAL-ALGAE	3	3	2	2	3		1989	0	112		112				0	0	0
CHIS ROCKY INTIDAL-AQINVT	3	3	2	2	3		1989	0	110		110				0	0	0
CHIS SANDY INTIDAL-AQINVT	1	4	2	2	4		1990	0	30		30		40		0	0	0
CHIS TERREST ARTH & SNAIL	3	3	3	2	2	1978		0	750	650	750	0	500		0	0	2
CHIS VASCULAR PLANTS	1	1	1	1	1		1987	0	751	751			100		0	0	0
CORO AMPHIBIANS	4	4	6	3	9	1979	1983	0	7	7						0	0
CORO AQUATIC INVERTS	6	6	6	5	7										0	0	0
CORO BIRDS	2	2	2	1	3	1974	1983	0	166		166	30	27		1	0	0
CORO FUNGI	6	6	6	6	7			0		0	0	0				0	0

APPENDIX II CONTINUED

PARK CODE	BIOLOGICAL GROUP	TAX COMP	GEO COMP	ECO COMP	SEAS COMP	INV HIST	INV YEAR	DOC YEAR	NUMB VOUCH	NUMB SPEC	EXP CHK	STAF CHK	UNCON- FIRM	NEW SP 10 YR	NEW SP CL	MIS ID	CONF EXT	POSS EXT
GOGA	TERRESTRIAL INVERTS	5	4	4	4	5	1985		100	100		100	0		0	0	0	0
GOGA	VASCULAR PLANTS	6	5	5	4	3	1972		0	1070				300	0	0	1	0
GRBA	AMPHIBIANS	6	5	5	4	7				10		0			0	0	0	0
GRBA	BIRDS	3	6	6	5	9	NONE	1990		166					0	0	0	0
GRBA	BUTTERFLIES	7	6	6	5	2	VARY	1988	88	88		0			0	0	0	0
GRBA	LAND SNAILS	7	4	4	5	6	UNKN		10	10	10	0			0	0	0	0
GRBA	MACRO-MOTHS	7	6	6	5	4	VARY	1990				0			0	0	0	0
GRBA	MAMMALS	3	5	5	5	9		1988		50					0	0	0	0
GRBA	REPTILES	6	5	5	4	7				19		0			0	0	0	0
GRBA	REPTILES AND AMPHIBS	6	5	5	5	7				6		0			0	0	0	0
GRBA	REPTILES AND AMPHIBS	6	5	5	5	7				20		0			0	0	0	0
GRBA	VASCULAR PLANTS	2	2	3	5	1	VARY	1989		589					0	0	0	0
GRBA	ZOOPLANKTON	7	6	6	5	5	VARY	1988							0	0	0	0
GRCA	AMPHIBIANS	3	2	2	2	5		1982	4	8	7		1		0	0	0	0
GRCA	AQUATIC INVERTS	6	6	6	5	7								0			0	0
GRCA	BIRDS	1	4	1	4	1		1984		299			0	0			0	0
GRCA	FUNGI	7	6	6	5	8									0	0	0	0
GRCA	LICHENS	6	6	6	6	8									0	0	0	0
GRCA	MAMMALS	1	5	1	4	1		1986		88	74		0				2	3
GRCA	REPTILES	3	2	2	2	5		1982	15	50	40		0			0	0	0
GRCA	TERRESTRIAL INVERTS	5	6	6	6	9		1974		247	0	0					0	0
GRCA	VASCULAR PLANTS	2	3	3	4	1		1987	1400	1400		0		1			0	0
HALE	AMPHIBIANS	1	3	3	2	2	1980	1980	0	3	3	0	0	0	0	0	0	0
HALE	ANNELIDA (SEG WORMS)	3	3	3	2	2	1982	1990		11	11	0	2	9	0	0	0	0
HALE	ARACHNIDS	3	3	3	2	2	1980	1990		90	90	0	10	40	0	0	0	0
HALE	BIRDS	1	1	1	1	2	1980	1985		32	32	0	0	3	0	0	1	4
HALE	BRYOPHYTES	2	1	1	1	2	1980	1989	185	185	185	0	0	68	0	0	0	0
HALE	CHILOPODA	3	3	3	2	2	1980	1990		5	5	0	3	3	0	0	0	0
HALE	DIPLODA	3	3	3	2	2	1	1990		11	11	0	1	1	0	0	0	0
HALE	FUNGI	6	5	5	4	9			0	5	5	0	0	0	0	0	0	0
HALE	INSECTS	2	3	3	2	1	1990	1990		1523	1523	0	196	530	9	0	0	0
HALE	LICHENS	4	4	3	4	2	1980	1989	118	118	118	0	5	0	0	1	0	0

APPENDIX II CONTINUED

APPENDIX 11 CONTINUED																				
PARK CODE	BIOLOGICAL GROUP	TAX COMP	GEO COMP	ECO COMP	SEAS COMP	INV HIST	INV YEAR	DOC YEAR	NUMB VOUCH	NUMB SPEC	EXP CHK	STAF CHK	UNCON- FIRM	NEW 10	SP YR	NEW SP	MIS CL	CONF ID	CONF EXT	POSS EXT
JOMU	REPTILES	6	6	6	5	9		1986	0								0	0	0	0
JOMU	TERRESTRIAL INVERTS	5	5	5	5	9		1984									0	0	0	0
JOMU	VASCULAR PLANTS	3	4	4	1	5	1989	1989	0		10				0		0	0	0	0
JOTR	AMPHIBIANS	1	2	1	2	1		1979	0	2	0	0					0	0	0	0
JOTR	ARTHROPODS	5	3	3	5	9	60'S			327							0	0	0	0
JOTR	ARTHROPODS	5	3	3	5	9	60'S			327							0	0	0	0
JOTR	BIRDS	1	3	1	2	1		1982		233							0	0	0	2
JOTR	MAMMALS	2	3	2	4	9	70's			46							0	0	0	0
JOTR	REPTILES	1	2	1	2	1		1979		37							0	0	0	0
JOTR	T & E PLANTS	1	4	1	6	6	1987	1987									0	0	0	0
JOTR	VASCULAR PLANTS	2	2	1	4	1	1976	1977	730	688							0	4	0	0
KAHO	AMPHIBIANS	6	6	6	5	8			0	1	0	0	0				0	0	0	0
KAHO	BIRDS	1	1	1	5	1	1987	1990	0	33	0	0	0	0	0		0	0	0	0
KAHO	BYOPHYTES	6	6	6	6	5			0	1	1	0	0	0	0		0	0	0	0
KAHO	FUNGI	6	6	6	6	5			0		0	0	0	0	0		0	0	0	0
KAHO	LICHENS	5	5	5	5	1	1987	1990	0	5	5	0	0	0	0		0	0	0	0
KAHO	MAMMALS	1	5	5	4	1	1987	1990	0	16	0	0	0	0	0		0	0	0	0
KAHO	MARINE INVERTEBRATES	2	3	3	6	5			0	33	33	0	2	0	0		0	0	0	0
KAHO	MARINE REPTILES	1	1	1	6	1	1989	1990	0	2	2	0	0	0	0		0	0	0	0
KAHO	TERRESTRIAL INVERTS	6	6	6	5	0									0		0	0	0	0
KAHO	TERRESTRIAL REPTILES	6	6	5	8	1	9	9	0	0	0	0	0	0	0		0	0	0	0
KAHO	VASCULAR PLANTS	1	1	1	6	1	1987	1990	0	72	0	0	0	0	0		0	0	0	0
KALA	AMPHIBIANS	6	6	6	5	8		1990	0								0	0	0	0
KALA	AQUATIC INVERTS	7	6	6	6	8											0	0	0	0
KALA	BIRDS	6	5	5	5	9		1990	0	8					0		0	0	0	0
KALA	MAMMALS	1	5	5	5	9		1990	0	10	0	0	0	0	0		0	0	0	0
KALA	RARE & SIG. PLANTS	1	3	3	5	2	1989	1990	0	12	12	0	1	0	0		0	0	0	0
KALA	REPTILES	7	6	6	5	8		1990	0	6	0	0	0	0			0	0	0	0
KALA	TERRESTRIAL INVERST	6	6	6	5	0											0	0	0	0
KALA	VASCULAR PLANTS	2	3	3	5	1	1989	1990	0	306	306	0	0	0	0		0	0	0	0
LABE	AMPHIBIANS	1	1	1	1	1		1990	0	2					0		0	0	0	0
LABE	AQUATIC INVERTS	6	5	5	4	7											0	0	0	0

APPENDIX II CONTINUED

APPENDIX 11 CONTINUED																				
PARK CODE	BIOLOGICAL GROUP	TAX COMP	GEO COMP	ECO COMP	SEAS COMP	INV HIST	INV YEAR	DOC YEAR	NUMB VOUCH	NUMB SPEC	EXP CHK	STAF CHK	UNCON-FIRM	NEW 10	SP YR	NEW SP	MIS CL	CONF ID	POSS EXT	POSS EXT
MUWO	LICHENS	6	6	6	5	1		1966							0	0	0	0	0	0
MUWO	MAMMALS	6	5	5	4	9				26						0	0	3	1	1
MUWO	REPTILES	6	5	5	4	9				11						0	0	0	0	0
MUWO	TERRESTRIAL INVERTS	6	5	5	4	9										0	0	0	0	0
MUWO	VASCULAR PLANTS	3	1	3	2	1	1978		0	180					1	0	0	0	2	2
NASA	AMPHIBIANS & REPTILE	1	1	1	1	4	1986	1988	0	15	15	0	0	0	0	0	0	0	0	0
NASA	AMPHIBIANS & REPTILE	1	1	1	1	4	1986	1988	0	15	15	0	0	0	0	0	0	0	0	0
NASA	AQUATIC INVERTS	7	6	6	6	8										0	0	0	0	0
NASA	BIRDS	7	6	6	5	4	1986	1988	0	55	55	0	0	0	0	0	0	0	0	0
NASA	MAMMALS	2	2	2	1	4	1986	1988	0	9	9	0	0	0	0	0	0	0	0	0
NASA	TERRESTRIAL INVERTS	6	6	6	5	0										0	0	0	0	0
NASA	VASCULAR PLANTS	6	6	6	5	8		1988	0			0	0	0	0	0	0	0	0	0
ORPI	AMPHIBIANS	1	3	1	1	1	1937	1990	4	5	4	5	1	0	0	0	0	0	0	0
ORPI	AQUATIC INVERTS	5	3	1	2	5	1982	1982	0	61	61	0	0	0	0		0	0	0	0
ORPI	BIRDS	1	3	1	1	2		1988	94	277	277		0	2	0	0	0	0	0	0
ORPI	FUNGI	6	6	6	5	7			0		0	0	0	0	0		0	0	0	0
ORPI	LICHENS	4	4	4	6	6	1988	1988	0	33	33	0	0					0	0	0
ORPI	MAMMALS	1	3	1	1	1		1990	32	48	61	52	0	1	0	0	0	0	0	0
ORPI	REPTILES	1	3	1	1	1	1937	1985	38	43	43	43	0	2	0	0	0	0	0	0
ORPI	TERRESTRIAL INVERTS	3	3	1	2	5		1990					0	0	0		0	0	0	0
ORPI	VASCULAR PLANTS	1	2	1	1	1		1985	502	522	572	522	0	0	0	1	2	0	1	1
PEFO	AMPHIBIANS	4	5	5	5	1		1976	0	8		8						0	0	0
PEFO	AQUATIC INVERTS	6	6	6	5	8	0000	0	0	0	0	0	0	0	0			0	0	0
PEFO	BIRDS	2	3	6	5	1	1984	1984	48	180								0	0	0
PEFO	FUNGI	6	6	6	6	7			0									0	0	0
PEFO	LICHENS	6	6	6	6	7	TEXT	1991										0	0	0
PEFO	MAMMALS	4	4	5	4	8	1986	1986	26	48						0		3	0	0
PEFO	REPTILES	4	5	5	5	1		1976	0	15		8						0	0	0
PEFO	TERRESTRIAL INVERTS	5	6	6	5	8			802									0	0	0
PEFO	VASCULAR PLANTS	2	3	6	5	5	1980	1981	301	346		305		64	0	0	0	0	0	0
PINN	AMPHIBIANS	7	6	6	5	8		1987		8						0	0	0	0	0
PINN	AQUATIC INVERTS	7	6	6	5	8										0	0	0	0	0

APPENDIX II CONTINUED

APPENDIX 11 CONTINUED																				
PARK CODE	BIOLOGICAL GROUP	TAX COMP	GEO COMP	ECO COMP	SEAS COMP	INV HIST	INV YEAR	DOC YEAR	NUMB VOUCH	NUMB SPEC	EXP CHK	STAF CHK	UNCON- FIRM	NEW 10	SP YR	NEW SP	MIS CL	CONF ID	POSS EXT	POSS EXT
PUHO	BRYOZOA	3	3	2	2	3	1957	1986	0	1	1	0	0	0	0	0	0	0	0	0
PUHO	COELENTERATES	3	3	2	2	3	1957	1986	0	5	5	0	1		0	0	0	0	0	0
PUHO	ECHINODERMATA	3	3	2	2	3	1957	1986	0	18	18	0	2		0	0	0	0	0	0
PUHO	INVERTEBRATES	4	4	4	5	1	1976	1976	0	150						0	0	0	0	0
PUHO	MAMMALS	6	5	5	5	1	1976	1976	0	8	0	0	0			0	0	0	0	0
PUHO	MOLLUSCA	3	3	2	2	3	1957	1986	0	46	46	0	4		0	0	0	0	0	0
PUHO	MOLLUSCA	3	3	2	2	3	1957	1986	0	46	46	0	4		0	0	0	0	0	0
PUHO	PORIFERA	3	3	2	2	3	1957	1986	0	2	2	0	0		0	0	0	0	0	0
PUHO	REPTILES	2	2	2	5	1	1976	1976	0	6	0	0	0			0	0	0	0	0
PUHO	VASCULAR PLANTS	1	1	1	1	4	1983	1986	0	126	0	0	0			0	0	0	0	0
REDW	AMPHIBIANS	5	4	4	3	5	1988			19						0	0	0	0	0
REDW	AQUATIC INVERTS	1	2	1	1	3	1980		1000			1000			2	0	0	0	0	0
REDW	BIRDS	2	1	3	2	2		1984		370		0			0	0	0	3	0	0
REDW	FUNGI	6	6	6	6	7										0	0	0	0	0
REDW	LICHENS	4	4	4	4	5		8684		48						0	0	0	0	0
REDW	MAMMALS	2	3	3	2	5	85-7			39	39	39	1			0	0	3	0	0
REDW	REPTILES	7	6	6	5	9		1964								0	0	0	0	0
REDW	TERRESTRIAL INVERTS	6	6	6	5	7										0	0	0	0	0
REDW	VASCULAR PLANTS	3	2	3	2	1	1970		1285	711	1006	1035	250	350		0		0	1	1
SAGU	AMPHIBIANS	1	2	2	1	5		1986		8	8						0	0	0	0
SAGU	AQUATIC INVERTS	6	6	6	6	7												0	0	0
SAGU	BIRDS	2	2	2	1	1		1985	0	9					1			0	0	0
SAGU	FUNGI	6	6	6	6	7			0		0	0	0					0	0	0
SAGU	LICHENS	1	6	6	5	6	1986	1987	287	250	250		37					0	0	0
SAGU	MAMMALS	2	4	4	5	1		1987	72	66							0	0	0	0
SAGU	REPTILES	2	2	2	1	5		1986		50	9							0	0	0
SAGU	TERRESTRIAL INVERTS	7	6	6	5	8												0	0	0
SAGU	VASCULAR PLANTS	2	2	2	2	5	1981	1985	936	986	986				2			0	0	0
SAMO	AMPHIBIANS	1	3	2	1	3	NOTE	1986		10	10				0	0	0	0	1	1
SAMO	BIRDS	1	1	1	1	1	NONE	1987		263					1	0	0	0	0	0
SAMO	BRYOPHYTES	1	4	3	1	1	1978	1978	43	43	43	43	0		0	0	0	0	0	0
SAMO	BUTTERFLIES	3	6	6	5	8		1985		80		0				0	0	0	0	0

APPENDIX II CONTINUED

		APPENDIX 11 CONTINUED																			
PARK CODE	BIOLOGICAL GROUP	TAX COMP	GEO COMP	ECO COMP	SEAS COMP	INV HIST	INV YEAR	DOC YEAR	NUMB VOUCH	NUMB SPEC	EXP CHK	STAF CHK	UNCON-FIRM	NEW 10	SP YR	NEW SP	MIS CL	CONF ID	POSS EXT		
USAR	ALGAE	1	1	1	6	2	1988	1989	0	4	4	0	4		4	0	0	0	0		
USAR	AMPHIBIANS	6	6	6	5	8										0	0	0	0		
USAR	ANNELIDA	1	1	1	6	2	1988	1989	0	4	4	0	0		4	0	0	0	0		
USAR	ARTHROPODS	1	1	1	6	2	1988	1989	0	2	1	1	1		2	0	0	0	0		
USAR	BIRDS	6	6	6	5	8										0	0	0	0		
USAR	COELENTERATES	1	1	1	6	2	1988	1989	0	3	0	3	0		6	0	0	0	0		
USAR	ECTOPROCTA	1	1	1	6	2	1988	1989	0	1	1	0	0		1	0	0	0	0		
USAR	MAMMALS	6	6	6	5	7										0	0	0	0		
USAR	MOLLUSCA	1	1	1	6	2	1988	1989	0	6	6	0	3		6	0	0	0	0		
USAR	MOLLUSCA	1	1	1	6	2	1988	1989	0	6	6	0	3		6	0	0	0	0		
USAR	POIFERA	1	1	1	6	2	1988	1989	0	12	0	12	12		12	0	0	0	0		
USAR	REPTILES	6	6	6	6	0										0	0	0	0		
USAR	UROCHORDATA	1	1	1	6	2	1988	1989	0	6	0	6	6		6	0	0	0	0		
USAR	VASCULAR PLANTS	6	6	6	6	7										0	0	0	0		
WACA	AMPHIBIANS	6	6	6	5	8			0	0								0	0		
WACA	AQUATIC INVERTS	6	6	6	6	7												0	0		
WACA	BIRDS	3	6	6	5	1	1954	1985	22	117								0	0		
WACA	FUNGI	6	6	6	6	7			0									0	0		
WACA	LICHENS	6	6	6	6	7			0									0	0		
WACA	MAMMALS	4	5	5	5	9	1973	1985	51	52		0				0		0	1		
WACA	REPTILES	6	6	6	5	6		1968	0									0	0		
WACA	TERRESTRIAL INVERTS	5	6	6	3	5	1963		639									0	0		
WACA	VASCULAR PLANTS	3	3	3	1	5	1990	1990	261	300	250	50	40		14		2	0	0		
WAPA	AMPHIBIANS	6	6	6	5	8		1983	0	0	0	0	0			0	0	0	0		
WAPA	AQUATIC INVERTS	6	6	6	6	7										0	0	0	0		
WAPA	BIRDS	2	2	2	2	8		1983	0	12	0	0	0		0	0	0	0	0		
WAPA	LICHENS	6	6	6	6	8		1983	0	7	7	0	0		0	0	0	0	0		
WAPA	MAMMALS	2	2	2	2	8		1983	0	3	0	0	0			0	0	0	0		
WAPA	REPTILES	6	6	6	6	0										0	0	0	0		
WAPA	TERRESTRIAL INVERTS	6	6	6	5	0										0	0	0	0		
WAPA	VASCULAR PLANTS	4	4	4	4	8		1983	0	3	0	0	0			0	0	0	0		
WHIS	AMPHIBIANS	7	6	6	6	8										0	0	0	0		

APPENDIX III. COMPLETE LIST OF MAPPED INFORMATION - PART 1

REPORT ON THE MAPS OF PARKS IN THE WESTERN REGION

PARK MAP THEME CODE	1ST DATE	UP DATE	INVESTIGATOR	BASE SCALE	GEO CLASSIFICATION SCHEME REF
AMME VEGETATION	1990	1990	AMME4.DWG	1"=200'	1 VEGETATION
CABR GEOLOGY.	1975	0	USGS	1:3000	1 6 GEOLOGIC ASSOCIATIONS.
			NPS STAFF.		
CABR REGIONAL GEOLOGY.	1975	0	M.P. KENNEDY OF USGS	1:24000	1 MANY GEOLOGIC FORMATIONS VARY BETWEEN MAPS.
CABR REGIONAL SOILS.	1973	0	USDA-SCS.	1:24000	1 MANY SOIL TYPES AND AG & URBAN DEVELOPMENT RATINGS
CABR SOILS.	1973	0	USDA-SCS	1:3000	1 9 SOIL TYPES
			NPS STAFF		
CABR VEGETATION.	1989	0	CLARK, HALVORSON, ETC.	1:3000	1 10 "VEGETATION TYPES" INCLUDING EXOTIC AND DIST.
CAGR SOIL & MOISTURE CNSR	1941	0	NPS	1:300	1 EROSION AREAS
CAGR SOIL MAP	1917	0	USDA	1:1MILE	1 SOIL TYPES AND CONTOURS
CAGR VEGETATION	1986	0	REICHARDT	1:200	1 VEG TYPES
CHIR SOIL MAP	1979	0	POST-CPSU/UA	1CENT=10 METERS	2 SOIL MAPPING UNIT
CHIR VEG MAP	1937	0	UNKNOWN		3
CHIR VEG TYPE	1938	0	ROSEBERRY & DOLE	1=1/8	1 VEG TYPES
CHIS FAULTS AND LANDSLIDE	1979	0	SEE NOTES (SENS PL).	VARY BY ISLAND.	3 FAULTS, MOVING FAULTS, LANDSLIDES, GEOLOGY, ETC.
CHIS GENERALIZED SOILS.	1979	0	SEE NOTES (SENS PL).	VARY BY ISLAND.	3 SOIL TYPES 4=SMI, 3=A1.
CHIS SENSITIVE PLANTS.	1979	0	SB BOTANIC SOCIETY.	1:46000	3 GEN. LOCATIONS OF SENSITIVE PLANT SPP SEV. SPP.
CHIS SMI GEOLOGIC MAP.		0	WEAVER & DOERNER.	1:24000	1 FAULTS, CONTACT ZONES, GEOLOGIC FORMATIONS, ETC.
CHIS VEG & LANDFORMS INV.	1971	0	CA NAVIG & OCEAN DEV	1:31680	1 GENERALIZED NATURAL VEG AND LANDFORMS ~10 CLASSES
CHIS VEGETATION OF SCI.	1980	0	MINNICH, R.A.	1:24000	1 VEGETATION (PHYSIOGNOMIC) TYPES.
CHIS VEGETATION OF SRI.	0	0	HALVORSON	1:24000	1 VEGETATION POLYGONS AND OTHER GROUND COVER.
CHIS VEGETATION.	1979	0	SEE NOTES (SENS PL).	1:13000	3 VEGETATION TYPES.
CHIS VEGETATION.	1980	0	NPS STAFF.	VARY BY ISLAND.	3 GENERALIZED VEG AND LAND COVER.
CORO GENERAL SOILS MAP	1971	0	SCS	1:500000	1 SOILS
CORO GEOLOGY	1959	0	MOORE, NPS	1=800'	1 GEOLOGIC
CORO GEOLOGY	1985	0	DOE, MICHAEL		3 GEOLOGIC STRUCTURES
CORO GEOLOGY MAP	1968	0	HAYES AND RAUP	1:48,000	1 GEOLOGIC
CORO NATURAL HISTORY	1959	0	JACKSON, NPS		1 VEG AND BOUNDARY
CORO VEGETATION	1989	0	RUFFNER, ESMP	1:6000	1 COMMUNITY TYPES & FIRE SPREAD
DEVA ENDEMIC PLANT SPP	1972	1979	NPS STAFF	1:250000	1 ENDEMIC PLANT DISTRIBUTION POLYGONS 36 SPP.
DEVA EXOTIC PLANT DIST.	1989		RES MGMT STAFF	1:250000	1 DIST OF SALT CEDAR AND ATHEL MAPPED AS POLYGONS.
DEVA VEGETATION	1966		HUNT AND DURRELL '66	1:62500	1 17 DOM SPP ASSOCIATIONS WITHIN 4 VEG TYPES.
DEVA VEGETATION	1984	0	PETERSON	CHECK AT UNLV	2 17 ASSOCIATIONS WITHIN 5 ZONES
DEVA VEGETATION	1984	0	ANNABLE, C.R. 1984	1:62500	1 9 ASSOCIATIONS WITHIN 3 VEGETATION ZONES
DEVA VEGETATION-HABITAT			NPS STAFF	1:250000	1 6 VEGETATION-HABITAT CLASSES INDICATED.
ECHI GEOLOGY OF SRI.	1969	0	SONNEMAN, WEAVER, ETC	1:24000	1 GEOLOGIC FORMATIONS, FAULTS, LANDSLIDES, ETC.
FOBO VEGETATION MAP	0	1976	WARREN & HOY, 1976	1"=500'	1 PLANT COMMUNITY TYPES
GOGA GEOMORPHOLOGY	1974	1975	WAHRHAFTIG, SWA GROU	PUBL. 1:250000	1 MAJOR GEOLOGIC FEATURES (FAULTS, ROCK FORMATIONS)
GOGA SOILS	1967	1975	SOIL CONS SERV /SWA	PUBL. 1:250000	1 SOIL TYPE / SERIES
GOGA SURFACE & BEDROCK GE	1975	1975	HARDING-LAWSON, SWA	PUBL. 1:250000	1 ROCK TYPE / FORMATION, GENERAL GEOLOGIC AGE
GOGA VEGETATION	1975	0	SWA GROUP	PUBL. 1:250000	1 MAJOR VEGETATION TYPES (e.g. GRASSLAND, REDWOOD)
GRBA GEOLOGY	1969	0	WHITEBREAD OF USGS.	1:48000	1 DETAILED MAP OF NUMEROUS GEOLOGIC UNITS.
GRBA GEOLOGY	1988	0	NPS STAFF	1:24000	1 13 GEOLGIC UNITS MAPPPED.
GRBA RANGE SUIT & VEG	0	0	USFS STAFF.	1:20000	1 5 RANGE SUIT. CATEGORIES AND 10 GENERAL VEG TYPES.
GRBA VEGETATION	0	1990	RAY JAINDL (OR ST U)	1:24000	1 GENERALIZED VEGETATION TYPES EMPHASIS ON RANGE.
GRCA GEOLOGY	1980	0	BILLINGSLEY & HUNTOON	1:62500	1
GRCA VEGETATION	1980	1982	WARREN ET AL.	1:62500	1 VEGETATION TYPES. BROWN, LOWE & PACE
HALE GEOLOGY	1989	1989	PAAR	1:24000	1 VOLCANIC SERIES
HALE VEGETATION	1980	1980	PARK	1:24000	1 VEGETATION DISTRIBUTION
HALE VEGETATION	1985	1985	PARK	1:6000	1 VEGETATION DISTRIBUTION
HALE VEGETATION	1989	1989	PAAR	1:24000	1 VEGETATION SCHEME DISTRIBUTION
HAVO ALIEN SPECIES	1984	1990	PARK	1:12,000	1 LOCATIONS OF ~20 ALIEN SPECIES
HAVO EAST RIFT AREA	1988	1988	PARK	1:24000	1 WEED, RARE PLANTS, VEGETATION TYPE, PIG ACTIVITY
HAVO ERUPTIVE FISSURES	1986	1986	USGS	1:24,000	1 LAVA FLOWS, PREHISTORIC TO PRESENT
HAVO GEOLOGIC	1963	1967	DONALD W. PETERSON	1:24000	1 LAVA FLOWS
HAVO OLA'A TRACT	1988	1988	PARK	1:24000	1 WEED, RARE PLANT, VEGETATION TYPE, PIG ACTIVITY
HAVO PLANT DISTRIBUTION	1984	1990	PARK	1:12,000	1 ALIEN SPECIES DISTRIBUTION

PARK MAP THEME CODE	1ST DATE	UP INVESTIGATOR DATE	BASE SCALE	GEO CLASSIFICATION SCHEME REF
NASA SOILS	1981	1981 AM. SAMOAN GOV.	1000M GRID	1 6 PLATES OF DIFFERENT REGIONS
NASA VEG AND SOILS	1981	1981 AM. SAMOAN GOV.	1000M GRID	1 5 PLATES OF DIFFERENT REGIONS
ORPI 3 SPECIE VEG MAP	1984	0 UNKNOWN	1:62500	1 ELEPHANT TREE, SENITA & ACUNA DISTRIBUTION
ORPI GEN VEG TYPES, H2O	1974	0 DSC	1:422400	1 VEG COMMUNITIES, WELLS, SPRINGS, BOUNDARY
ORPI GEOLOGY	1980	0 MAY, PETERSON, ET AL.	1:62500	1 GEOLOGIC COMPOSITE
ORPI PRIN MINES & PROSPEC	1974	0 DSC	1:422400	1 MINES, CLAIMS, BOUNDARIES, MINERALIZED AREAS
ORPI SOIL MAP INDEX	1972	1988 UNKNOWN	1:168960	1 INDEX, 28 MAP SHEETS
ORPI SOIL MAPS	1972	0 UNKNOWN	1:24000	1 SOILS
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, DIAZ PEAK SW
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, LUKEVILLE NE
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, DIAZ PEAK NW
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, QUITOBAQUITO NE
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, KINO PEAK NW
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, MT AJO SW
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, KINO PEAK, SW
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, KIMO PEAK NE
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:62500	1 VEGETATION ASSOCIATIONS
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, MT AJO NW
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, AGUA DULCE NE
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, LUKEVILLE NW
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, AGUA DULCE SE
ORPI VEGETATION	1979	0 WARREN, NPS/UA	1:24000	1 VEGETATION ASSOCIATIONS, KINO PEAK SE
ORPI WATER DEVELOPMENT	1940	0 UNKNOWN	UNKNOWN	1 WATER SOURCES, GEOLOGY
PEFO GEOLOGY	1981	0 BILLINGSLEY & BREED	1:48000	1 GEOLOGIC STRATA UNITS
PEFO SOILS	1975	0 SCS	1:31680	1 SOIL TYPE
PEFO VEGETATION	1976	1978 UA - MILLER	1:24000	1 VEGETATIVE COMMUNITIES
PINN EXOTIC PLANT DISTRIB	0	0 NPS - DeBenedetti	1:24,000	1 DISTR. OF CENTAUREA MELITENSIS & MARRUBIUM VULGARE
PINN GEOLOGY	0	0 USGS		1
PINN GEOLOGY	1970	0 Vincent Matthews III	1:24000	3 ROCK TYPE, W/ DESCRIP. (eg WHITE, NON-PORPHYRITIC)
PINN MONITORING SITES	1984	0 NPS - VAN RIPER, HAL	1:12000	3 VEGETATION TYPES / MONITORING STATIONS
PINN SOILS	1969	0 USDA SOIL CONSERV SE	1:20,000	3 SOIL ASSOCIATIONS
PINN VEGETATION	1983	0 DSC - SUSAN STITT	1:12000	3 STRUCTURAL VEGETATION CLASSES
PORE GEOLOGY	0	0 USGS / GALLOWAY	1:24000	3 ROCK TYPE / AGE
PORE GEOLOGY	0	0		3
PORE RARE PLANTS	0	0 PORE ??	1:48000	3
PORE RARE PLANTS	1983	1989 PORE - CLARK & FELLE	1:24000	3 RARE PLANT SPECIES DIST
PORE SENSITIVE AREAS	1982	0 PORE/ CHARLESTON & M	1:48000	3 BIOLOGICAL, ENVIRONMENTAL, HISTORICAL IMPORTANCE
PORE SOIL AND CAPABILITY	1968	0 USDA/SOIL CONSERV. S	1:7920	3 SOIL TYPE (KEY NOT FOUND)
PORE TIMBER / LOGGING HIS	1963	1966 HAMMON, JENSEN & WAL	1:6000	3 SIZE / DENSITY OF TIMBER, LOGGING HISTORY
PORE VEG - PIERCE PT.	1981	0 PORE. LATHROP & GOGA		3
PORE VEGETATION	0	0 PORE?	1:24000	3 VEGETATION TYPE, DENSITY
PORE VEGETATION	1960	0 ??	ca. 1:60000	3 DOMINANT VEGETATION AND SOIL TYPE
PUHE TOPOGRAPHIC	1988	1988 NPS	1"=80'	1 TOPOGRAPHIC AND SOME VEGETATION
PUHE VEGETATION	1977	1977 MACNEIL & HEMMES	1"=500'	1 VEGETATION DISTRIBUTION
PUHO VEGETATION	1976	1986 MACNEIL & HEMMES	1:7800	1 VEGETATION DISTRIBUTION
REDW BOUNDARY / TIMBER	1968	0 REDW	1:12000	1 BOUNDARIES, SIZE/DENSITY, LOGGING, DOMINANT SPECIES
REDW EROSION, SEDIMENTATI	1982	0 J. PITLICK	LARGE SCALE	1 LANDSLIDES AND LOGJAMS RECORDED
REDW FOREST CLASSIFICATIO	1966	0 HAMMON, JENSEN & WAL	1:24000	1 AGE/SIZE, DENSITY, SPECIES
REDW GEOLOGY	1981	0 D. R. HARDEN ET AL.	1:62500	1 NAMED ROCK TYPE / UNIT (e.g., REDWOOD CREEK SCHIST
REDW GEOLOGY	1964	1973 CAL DIV MINES & GEOL	1:250000	1 AGE AND TYPE OF ROCK
REDW GEOLOGY / BEDROCK	1979	0 REDW/DSC	APP 1:75000	3 AGE / GENERAL ROCK TYPE
REDW GEOMORPH/STREAM PROC	1984	0 M. A. MADEJ	1:6000	1 LANDSLIDES, LOGJAMS GRAVEL BARS RECORDED
REDW LAND USE	1984	0 D. BEST & L. VANDER	1:12000	3 LAND USE CATEGORIES AND VEGETATION COVER TYPES
REDW SOIL-VEGETATION	1959	1961 DELAPP, GLADISH, SKO	1:31680	3 SOIL SERIES / PLANT GROWTH FORM / DOMINANT SPECIES
REDW SOILS	1979	0 REDW/DSC	APP 1:75000	3 GENERAL STABILITY, POSITION, AND ORIGIN
REDW SOILS	1988	0 Popenoe	1:6000 DATA COL	1 SOILS
REDW TIMBER STAND MAP	1967	0 HAMMON, JENSEN, WALL	1:12000	1 SIZE / DENSITY, LOGGING HISTORY, DOMINANT SPECIES
REDW TIMBER STAND MAP	1974	0 DANIEL P. GAUT	1:12000	2 LOGGING INFORMATION (SELECTIVE, CLEARCUT, NO CUT)

PARK MAP THEME CODE	1ST DATE	UP INVESTIGATOR DATE	BASE SCALE	GEO CLASSIFICATION SCHEME REF
YOSE VEG./BLISTER RUST PR	1933	1969 YOSE / FORESTRY	1:7920 (8"=1MI)	3 DISTRIBUTION OF RIBES AND AREAS WHERE ERADICATED
YOSE VEG./INSECT CONTROL	19	19 YOSE / FORESTRY	1:7920 (8"=1MI)	3 INSECT CONTROL WORK, BY AREA
YOSE VEGETATION	1982	0 STEVE BOTTI / YOSE		3 VEGETATION TYPE - PHYSIOGNOMY / DOMINANT SPECIES
YOSE VEGETATION	19	19 YOSE / FORESTRY	1:18000	3 CAMPGROUND VEGETATION SURVEYS
YOSE VEGETATION	1930	1939 NPS BRANCH OF FOREST		3 VEGETATION TYPE - PHYSIOGNOMY / DOMINANT SPECIES
YOSE VEGETATION / SOILS	1963	0 ZINCKE AND ALEXANDER	1:24000	1 SOIL CLASS/SERIES. SPECIES ABUNDANCE FOR TIMBER

PARK MAP THEME CODE	NO. CLS	MIN MAP	FLD CHK	ACC %	COMP	MAP FORM	DATA STRU	REP	BACK UP	USE- FUL- COPY	NESS	COMMENTS
HAVO VEGETATION	30	2		85	3	1	2	1	1			2 KULANI QUADRANGLE
HAVO VEGETATION	30	2		85	3	1	2	1	1			2 VOLCANO QUADRANGLE
HAVO VEGETATION	30	2		85	3	1	2	1	1			2 KALALUA QUADRANGLE
HAVO VEGETATION	30	1 2		85	3	1	2	1	1			2 KAU DESERT QUADRANGLE, MAP# 60
HAVO VEGETATION	30	2		85	3	1	2	1	1			2 KALAPANA QUADRANGLE
HAVO VEGETATION	1	1 2		80	1	1	2	1	1			1
HAVO VEGETATION	30	1 2		85	3	1	2	1	1			2 KIPUKA PAKEKAKE QUADRANGLE, MAP# H-49
HAVO VEGETATION	30	1		85	2	1	2	1	7			3
HAVO VEGETATION	30	1		85	2	1	2	1	7			3
HAVO VEGETATION	30	2		85	3	1	2	1	1			2 WOOD VALLEY, MAP# H-50
HAVO VEGETATION	30	2		85	3	1	2	1	1			2 PUU ULAULA, MAP# H-48
HAVO VEGETATION	30	1		85	2	1	2	1	7			3
HAVO VEGETATION	4	2		25	3	1	2	1	1			6 MAP OUT OF DATE, UP DATED MAPS EXIST
HAVO VEGETATION	4	1 2		80	3	1	2	1	1			2 KAU DESERT AND COASTAL LOWLANDS
HAVO VEGETATION	30	1 2		85	3	1	2	1	8			3 1982 MAP WITH OVERLAY UPDATE
HAVO VEGETATION MAPS	56	2		75	2	1	1	1	6			2 25 AREA MAPS THAT ENCOMPASS THE PARK
JOMU SOILS	45	4 3			1	1	3	1	6			7 CONTRA COSTA COUNTY - STATE SOIL SURVEY? SM. SCALE
JOMU WETLANDS	42	3			1	1	3	1	6			6 U S FISH & WILDLIFE SERVICE NAT. WETLAND INVENTORY
JOTR GEOLOGIC MAP	80	Y			1	1	3	1	8			2 OLDER MAP COVERING ALL OF SOUTHERN CA.
JOTR GEOLOGIC MAP	71	3			1	1	3	1	1			3
JOTR GEOLOGIC MAP	19	Y			3	1	3	1	1			3
JOTR HYDROLOGIC & GEOLOG.		1			3	1	3	1	8			3 WORK DONE FOR NPS ONLY COVERS PINTO BASIN.
JOTR VEGETATION	15			50	2	1	3	1	4			4 GOOD COM ANAL; POOR MAP; COMPOSITE BY DSC IN '90.
JOTR WELLS, SPRINGS, GEOL		2			3	1	3	1	8			2 ONLY INCLUDES N. PORTION OF PARK; MINIMAL UTILITY.
KAHO GEOLOGY AND SOILS	7	1 2		85	2	0	2	6	8			3 SEE NOTES
KAHO VEGETATION TYPE MAP	14	1 2		85	2	0	2	6	8			3 SEE NOTES
KAHO VEGETATION TYPE MAP	5	1 2		85	2	0	2	6	8			3
KAHO VEGETATION TYPE MAP	17	1 2		85	2	0	2	6	8			3
KALA TOPOGRAPHIC	16	1 1		75	1	1	2	1	1			2 COLOR MAP OF MOLOKAI
LABE GEOLOGY	8	1 3			2	1	3	1	8			2 FILED LAVA BEDS GENERAL
LABE GEOLOGY/CAVES/ROADS	0	5 3			1	1	3	1	8			7 MAP SHOWS LANDMARKS, MAJOR CAVES, LAVA FLOWS
LABE LANDMARKS / VEGETATI	0	3			3	1	3	1	8			2 INCLUDES PETROGLYPHS SECTION
LABE NAT HIST BASE / BIOL	20	3			2	1	3	1	8			2 MASTER PLAN MAP. FILED IN LAVA BEDS GENERAL
LABE NAT HIST BASE / GEOL	4	3			2	1	3	1	8			3 MASTER PLAN MAP. FILED IN LAVA BEDS GENERAL
LABE VEGETATION	39	1 3			2	1	3	1	8			3 FILED LAVA BEDS GENERAL. VERY DETAILED
LABE VEGETATION	10	1 3			2	1	3	1	8			2 FILED LAVA BEDS GEN. KEY NOT WITH MAP. "LB-4931-A"
LAME GENERAL VEGETATION.	5	3			1	0	3	1	4			4 EXTREMELY GENERAL ALSO HAS ROCK OUTCROP LAYER.
LAME GEOLOGY.		3			1	4	2	2	1			3 DISK COPIES IN PARK -- CAN BE CONVERTED IF NEEDED.
LAME MINERAL OCCURENCES.	43	3			1	2	3	1	6			3 19 METALS; 19 NONMETALS; 5 LEASABLE MINRL CLASSES.
LAVO LIFE ZONES	4	300 3			2	1	3	1	5			7 PART OF FINAL EIS - GMP, JANUARY 1981
LAVO RECENT GEOLOGIC EVEN	7	100 3			3	1	3	1	5			2 PART OF FINAL EIS - GMP, JANUARY 1981
LAVO SOIL LIMITATIONS	12	200 3			3	1	3	1	5			4 PART OF FINAL EIS - GMP, JANUARY 1981
LAVO STAND VEGETATION MAP		2 1		75	2	2	3	1	1			2 NEEDS A SYSTEMATIC CHECK
LAVO VEG. RECONAISSANCE		3			1	1	3	1	5			2 GOES WITH VEG MAP AND PHOTO FILE & NOTES OLD FIRES
LAVO VEGETATION	11	2 1		80	1	1	3	1	5			2 NOT SURE HOW CLASSES WERE DELINEATED
LAVO VEGETATIVE TYPES	6	25 3			2	1	3	1	5			3 PART OF FINAL EIS - GMP, JANUARY 1981
MOCA BIOTIC COMMUNITY	27	2			2	1	3	1	6			3 RUFFNER BACKUP
MOCA SOILS MAP	15	3			2	1	0	1	7			1
MUWO VEGETATION	9	1 1			2	1	0	1	8			2
MUWO VEGETATION	8	1 1			2	1	0	1	4			3 PART OF M.S. THESIS (SEE REF.)
MUWO VEGETATION	15	1 2			2	1	0	1	5			3 MIN. MAP 1/2 ACRE. SHOWS ALLUVIAL & OLD-GR. REDWOOD
NASA GEOLOGY	15	3			1	1	2	6	6			3 SEE NOTES
NASA SOILS	35	3			1	1	2	6	6			3 SEE NOTES
NASA VEG AND SOILS	11	3			1	1	2	6	6			3 SEE NOTES
ORPI 3 SPECIE VEG MAP	3	3			2	1	0	1	8			7 6-SHEET COMPOSITE KEYED FOR 3 SPECIES
ORPI GEN VEG TYPES, H2O	11	3			2	0	0	1	8			7 FROM ENVIRON ASSESS MASTER PLAN, MAR 1975
ORPI GEOLOGY	32	3		95	3	1	0	1	8			7 ONLY EXTREME WESTERN PORTION OF MONUMENT
ORPI PRIN MINES & PROSPEC	7	3			2	0	0	1	8			7 FROM ENVIRON ASSESS MASTER PLAN, MAR 1975
ORPI SOIL MAP INDEX		3		95	2	0	0	1	8			7 ONLY INDEX IS DIGITIZED
ORPI SOIL MAPS	23	3		95	2	1	0	1	8			7 28 SOIL SHEET MAPS OF ENTIRE PARK
ORPI VEGETATION	62	3			2	0	0	1	8			7 IN CONJUNCTION W/TECH REP, WARREN-NPS/UA, 1981
ORPI VEGETATION	62	3			2	0	0	1	8			7 IN CONJUNCTION W/TECH REP, WARREN-NPS/UA, 1981
ORPI VEGETATION	62	3			2	0	0	1	8			7 IN CONJUNCTION W/TECH REP, WARREN-NPS/UA, 1981
ORPI VEGETATION	62	3			2	0	0	1	8			7 IN CONJUNCTION W/TECH REP, WARREN-NPS/UA, 1981
ORPI VEGETATION	62	3			2	0	0	1	8			7 IN CONJUNCTION W/TECH REP, WARREN-NPS/UA, 1981

PARK MAP THEME CODE	NO. CLS	MIN MAP	FLD CHK	ACC %	COMP	MAP FORM	DATA STRU	REP	BACK UP	USE- FUL- COPY	NESS	COMMENTS
			UNIT									
SAMO FAULTS & LANDSLIDES			3		2	1	3	1	8	3		UNKNOWN DATA SOURCES, DATES.
SAMO GEOLOGY			1		1	1	3	1	5	2		VERY LARGE SCALE MAP.
SAMO GEOLOGY QUADS			1		3	1	3	1	6	2		ONLY WESTERN EDGE OF TOPANGA AND MALIBU AREAS.
SAMO LANDSLIDES			1		1	1	3	1	6	2		
SAMO RARE & ENDAN PLANTS		1	2	95	1	4	2	1	1	3		VERY ACCURATE LOCATION MAP FOR R & E PLANTS.
SAMO S.E.A. VEGETATION	30		1		3	2	3	1	1	7		
SAMO SEISMIC RESPONSE			3		1	2	3	1	8	3		UNKNOWN INVESTIGATORS, DATES, DATA SOURCES.
SAMO SENS PLANT & COMMUN.			1		1	1	3	1	8	4		NEEDS TO BE UPDATED TO REFLECT CURRENT DATA.
SAMO VARIOUS APPL. MAPS			3		2	4	2	1	1	3		SOILS, GEOL, WLDLFE CORR'S, ETC FOR SPECIFIC SITES
SAMO VEG & LAND USE	60	1	2	95	1	4	2	1	1	3		GOOD VEG MAP JUST ARRIVED IN PARK.
SAMO VEGETATION			3		2	2	3	1	6	7		ON USGS QUADS; NO LEGEND; ESRI MAPS.
SAMO VEGETATION	12		2		2	1	3	1	8	1		MISSING WESTERN QUAD; FROM VEG TYPES OF CA (USFS).
SEKI GEOLOGY.	120	12	2		1	3	2	1	6	3		FIELDWORK IS CURRENTLY BEING COMPLETED FOR PARK.
SEKI HISTORIC VEGETATION.	50		1	2	3	1	3	1	3	1		GEO-REFERENCING PROBLEMS BEING WORKED ON NOW.
SEKI LAND COVER.	139	30	0		1	3	1	1	2	4		THEME WILL REQUIRE LOTS OF CLASSIFICATION EFFORT.
SEKI SEQUOIA TREE INVENT.			3		0	0	0	1	8	7		SEE TOM STOHLGREN ABOUT THESE.
SEKI SOILS.	40	1	2	90	3	1	1	1	5	3		
SEKI VEGETATION.	24		2		2	2	3	1	1	4		EACH PARK MAPPED SEPERATELY W/ DIFFERENT SCHEMES.
TONT PARKING AREA PLANT	17		3		3	1	0	1	2	1		
WACA GEOLOGIC MAP	4		3		1	1	0	1	8	7		MAP ON WALL IN LUNCH/CONFERENCE ROOM
WHIS GEOLOGY	26	1	3	0	3	1	3	1	6	7		FRENCH GULCH QUAD. DETAILED GEOLOGY
WHIS GEOLOGY - MINERALS/M	0		3	0	3	1	3	1	6	7		FRENCH GULCH QUAD. GENERALIZED GEOLOGY - MINERALS
WHIS LIFE ZONE / COMMUNIT	4	5	3		2	1	3	1	8	7		DSC PLANNING MAP? "OVERLAY FOREST & LAND CLASSIF.
WHIS SOIL / MOISTURE CONS	6	10	3		2	1	3	1	6	7		PRIORITIES FOR SOIL & MOISTURE CONSERVATION
WHIS SOILS - GENERAL	40	1	3		2	1	3	1	8	7		APPARENT BASE MAP OF 1:37300 MAP. FILED MISC. MAPS
WHIS SOILS - GENERAL	40	1	3		1	1	3	1	6	7		FILED UNDER "MISC. MAPS" IN FOLDER FROM USDA/SCS
WHIS SOILS AND VEGETATION	50	1	3		1	1	3	1	6	7		4 MAPS COVERING WHIS. ACCOMPANIES MALLORY ET AL. 73
WHIS TIMBER TYPE/LOGGING	16	1	1	0	2	2	3	1	6	7		INCLUDES CODES FOR VEG CLASS, DENSITY, TIMBER SPP.
WHIS TIMBER TYPE/LOGGING	16	1	1	0	2	1	3	1	6	7		EASEMENT AREA S OF WHISKEYTOWN LAKE (S TO IGO)
WHIS WOODLAND SUITABILITY	8	5	3		2	1	3	1	6	7		FILED UNDER "MISC. MAPS" IN FOLDER FROM USDA/SCS
YOSE GEOLOGY	82	500	3		1	0	0	1	6	3		FRESNO SHEET. COPIES IN RESEARCH MUSEUM LIBRARY
YOSE GEOLOGY	83	500	3		1	0	0	1	6	3		MARIPOSA SHEET. COPIES IN RESEARCH MUSEUM LIBRARY
YOSE GEOLOGY	22	5	3		3	0	0	1	6	3		CHECK ADDITIONAL USGS GEOLOGY MAPS
YOSE GEOLOGY	28	1	3		3	0	0	1	6	3		HETCH HETCHY QUAD. COPIES IN RESEARCH MUSEUM LIBRA
YOSE GEOLOGY	22	5	3		3	0	0	1	6	3		KAISER PEAK QUAD. COPIES IN RESEARCH MUSEUM LIBR
YOSE GEOLOGY	57	1	3		3	0	0	1	6	3		BOODIE QUAD. COPIES IN RESEARCH MUSEUM LIBRARY
YOSE GEOLOGY	12	1	3		3	0	3	1	6	3		COPIES IN RESEARCH MUSEUM LIBRARY
YOSE GEOLOGY	0		3		1	0	3	1	6	3		COPIES IN RESEARCH MUSEUM LIBRARY
YOSE VEG./BLISTER RUST PR	0		3		3	1	3	1	8	1		SECTION BY SECTION MAPS. PROJECT ENDED IN 1969
YOSE VEG./INSECT CONTROL	0		3		3	1	3	1	8	1		SECTION MAPS. LITTLE INFO OF USE TO THIS PROJECT
YOSE VEGETATION	29	0	1		2	0	0	1	8	7		
YOSE VEGETATION	0		3		3	1	3	1	8	2		BOX 4 OF FORESTRY RECORDS.MAY BE VALUABLE FOR COMP
YOSE VEGETATION	0	0	1		2	0	0	1	8	2		STD NPS VEG MAP (COFFMAN 1934). "1st set 1930-35"
YOSE VEGETATION / SOILS	55	1	1		3	1	0	1	5	3		VALLEY. INCLUDES SOIL PROFILES. BEING UPDATED

PARK CODE	IMAGERY	DATE YEAR	TYPE	SCALE	COMP	REP	BACK UP COPY	COMMENTS
HALE	AERIAL PHOTO	1975	2	UNKNOWN	1	1	9	APPENDIX I-A, WAIMOKU VALLEY, VEGETATION DISTRIBUTION
HALE	AERIAL PHOTO	1975	2	UNKNOWN	1	1	9	APPENDIX I-B; OHEO GULCH-SEVEN POOLS, VEGETATION DIS
HALE	AERIAL PHOTO	1975	2	UNKNOWN	1	1	9	APPENDIX I-D, CENTRAL PASTURE, 300-800 FT, VEGET.
HALE	AERIAL PHOTO	1975	2	UNKNOWN	1	1	9	APPENDIX I-E; PUU PALIKEA, VEGETATION DISTRIBUTION
HALE	AERIAL PHOTO	1975	2	UNKNOWN	1	1	9	APPENDIX I-F; KUKUI BAY TO OHAI POINT, VEGETATION
HALE	AERIAL PHOTO	1975	2	UNKNOWN	1	1	9	APPENDIX I-G; HWY 31 NEAR SEVEN POOLS, VEGETATION
HALE	AERIAL PHOTO	1975	2	UNKNOWN	1	1	9	APPENDIX I-H; PALIKEA STREAM, VEGETATION DISTRIB.
HALE	AERIAL PHOTO	1978	2	1"=600'	1	1	7	10-17-78; KALE-KIP-01C, 02C, KIPAHULU DISTRICT/OHEO
HALE	AERIAL PHOTO		3	UNKNOWN	1	1	9	
HAVO	AERIAL PHOTO	1943	1	UNKNOWN	3	1	9	LOWER AINAHOU EAST, M994.50-994.58 EVENS
HAVO	AERIAL PHOTO	1943	1	UNKNOWN	3	1	9	NAPAU TO AINAHOU, M994.63-994.71 ODDS
HAVO	AERIAL PHOTO	1943	1	1:1800	3	1	9	APUA TO WAHAULA, PRE-DEVELOPMENT, M994.1-994.13 ODDS
HAVO	AERIAL PHOTO	1943	1	UNKNOWN	3	1	9	KEAUHOU TO KAENA, M994.16-994.22 EVENS
HAVO	AERIAL PHOTO	1943	1	UNKNOWN	3	1	9	LOWER KALAPANA TRAIL, M994.26-994.30 EVENS
HAVO	AERIAL PHOTO	1943	1	UNKNOWN	3	1	9	KAHULEA TO HALAPE, M994.32-994.47
HAVO	AERIAL PHOTO	1945	1	6"=1 MILE	3	1	9	COMPILATION OF 32 PHOTOS OF KILAUEA CRATER AREA
HAVO	AERIAL PHOTO	1945	1	UNKNOWN	1	1	9	MISC. AERIALS OF PARK AREAS, 1945 AND BEFORE
HAVO	AERIAL PHOTO	1964	1	UNKNOWN	3	1	9	NALIKAHANE POINT TO KIAUEA, EKL 5CC 1-10, ELG 7-9
HAVO	AERIAL PHOTO	1964	1	UNKNOWN	3	1	9	PUNALUU TO MAUNA LOA, EKL 4CC 90-98
HAVO	AERIAL PHOTO	1964	1	UNKNOWN	3	1	9	HAMAKUA, EKL 4CC 119-128
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	1	ENLARGEMENT EKL 10CC 103
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	GLENWOOD SUBDIVISION, EKL 6CC 24-28
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	1	ENLARGEMENT EKL 14CC 72-74
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	1	ENLARGEMENT EKL 7CC 118
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	H-11 TO STAINBACK HWY, EKL 6CC 33-38
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	MAUNA LOA RESERVE TO KALAPANA FOREST, EKL 8CC 55-65
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KALAPANA BOUNDARY TO KEAUHOU RANCH, EKL 10CC 32-37
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	PUU KULUA TO KEAUHOU RANCH, EKL 10CC 43-45
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	MAUNA LOA SUMMIT, EKL 10CC 83-91
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KILAUEA TO NORTH OF KULANI, EKL 10CC 105-117
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KILAUEA TO NORTH OF KULANI, EKL 10CC 140-152
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	H-11 TO OLAA TRACT, EKL 6CC 87-94
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KA'ENA POINT TO GLENWOOD SUBDIV, EKL 12CC 137-147
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KALAPANA TRAIL TO H-11, EKL 12CC 155-161
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KAHUE POINT TO KALAPANA TRAIL, EKL 12CC 160-167
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	APUA POINT TO H-11, EKL 12CC 169-179
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KAPAOO POINT TO KAKAKE, EKL 12CC 197-212
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KAUHU'ULA TO KAPAPALA BOUNDARY, EKL 12CC 216-231
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	NAHULU POINT TO KEAUHOU RANCH, EKL 10CC 70-75
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	PALIMA POINT TO NAPI'UKULUA, EKL 12CC 232-245
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	MAUNA LOA RES TO KALAPANA FOREST, EKL 13CC 150-158
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	PUNALUU TO MAUNA LOA RESERVE, EKL 13CC 161-183
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	NAHULUHU POINT TO KEAUHOU RANCH, EKL 13CC 186-210
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KAPAPALA BOUND TO KEAUHOU RANCH, EKL 14CC 148-154
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	NAHULUHU POINT TO KEAUHOU RANCH, EKL 14CC 172-174
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	NAPI'UKULUA TO PUU KULUA, EKL 14CC 176-183
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KALAIO TO WAIKEA CAMP, EKL 14CC 186-193, 235
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KEAUKAHA, EKL 12CC 72-79
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KALAPANA TO LILEWA CRATER, EKL 12CC 45-51
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KAMAKUNA POINT TO PUU KAUKA, EKL 12CC 91-98
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KA'LAKE'APUKI PT TO GLENWOOD SUB, EKL 12CC 100-111
HAVO	AERIAL PHOTO	1965	1	UNKNOWN	3	1	9	KEAHUHU TO VOLCANOM EKL 12CC 184-195
HAVO	AERIAL PHOTO	1969	1	1:6000	3	1	9	AINAHOU TO DEVIL'S THROAT, 151.96 A1-A8
HAVO	AERIAL PHOTO	1969	1	1:6000	3	1	9	MAKAOPUHI TO AINAHOU, 151.96 B1-B11
HAVO	AERIAL PHOTO	1969	1	1:6000	3	1	9	NEAR MAKAOPUHI-ALAE-AINAHOU, 151.96 C1-C7
HAVO	AERIAL PHOTO	1969	1	1:6000	3	1	9	KALAPANA TRAIL TO MAKAOPUHI, 151.96 D1-D8
HAVO	AERIAL PHOTO	1969	1	1:6000	3	1	9	MAKAOPUHI TO AINAHOU ROAD, 151.96 E1-E14
HAVO	AERIAL PHOTO	1972	1	6"=13100'	3	1	9	PUAHI TO ESCAPE ROAD, 5718 1-2
HAVO	AERIAL PHOTO	1972	1	UNKNOWN	3	1	9	POLIOKEAWA TO COAST, 5812 2-6
HAVO	AERIAL PHOTO	1972	1	UNKNOWN	3	1	9	HALAPE TO KALUA (COASTLINE), 229 1-5
HAVO	AERIAL PHOTO	1972	1	6"=11500'	3	1	9	KAHUE TO MAKAOPUHI, 5810 1-8
HAVO	AERIAL PHOTO	1972	1	6"=11500'	3	1	9	KAENA TO PUAIALUA, 5811 1-8
HAVO	AERIAL PHOTO	1972	1	6"=13100'	3	1	9	POLIOKEAWA TO PAUHI, 5813 1-4
HAVO	AERIAL PHOTO	1972	1	6"=14000'	3	1	9	DEVIL'S THROAT TO ALAE, 5814 1-3
HAVO	AERIAL PHOTO	1974	1	6"=6600'	3	1	9	GREAT CRACK TO HALAPE, 6401 1-23

PARK CODE	IMAGERY	DATE YEAR	TYPE	SCALE	COMP	REP	BACK UP COPY	COMMENTS
KALA	ORTHOPHOTO	1968	1	1:24,000	1	1	9	KAMALO QUAD MAP
KALA	AERIAL PHOTO	1975	1	1"=500'	1	9	9	MAY 25, 1-105 THRU 1-143
KALA	AERIAL PHOTO	1975	1	1"=500'	1	9	9	MAY 25, 1-105 THRU 1-143, ENLARGEMENT OF 1-121
KALA	AERIAL PHOTO	1977	1	1"=120'	1	9	9	SETTLEMENT, ROADS, MAJOR BUILDINGS, WALLS: KALA04
KALA	AERIAL PHOTOGRAPHY	1977	1	12:12	1	9	9	SERIES OF 24 PHOTOS, USGS
KALA	AERIAL PHOTO	1983	1	UNKNOWN	1	9	9	JUNE 27, 6 FLIGHT PATHS
KALA	AERIAL PHOTO	1990	1	1"=500'	1	9	9	MAY 28, 6 FLIGHT PATHS (B/W)
KALA	AERIAL PHOTO	1990	1	1"=500'	1	9	9	B/W, IR, PENINSULA ONLY
KALA	AERIAL PHOTO	1982	2	1"=2000'	1	9	9	SERIES OF 7 PHOTOS, 1-62 THRU 1-68
KALA	AERIAL PHOTO	1983	2	UNKNOWN	1	9	9	JULY 1, 7 FLIGHT PATHS
KALA	AERIAL PHOTO	1990	3	1"=500'	1	9	9	MAY 29, 6 FLIGHT PATHS (COLOR IR)
LABE	AIR PHOTO		1	ca. 1:7900	3	1	9	NW CORNER "BIGHORN SHEEP AREA". FILED AERIAL PHOTO
LABE	AIR PHOTO	1944	1	ca. 1:22,000	2	1	9	NO INDEX. INCOMPLETE SET. E LINE FLOWN ON 9-8-46
LABE	AIR PHOTO	1964	1	ca. 1:7700	3	1	9	LARGE SCALE / PETROGLYPHS AREA. FILED AERIAL PHOTO
LABE	AIR PHOTO	1972	1	ca. 1:63,000	2	1	9	MISSING PART OF NE CORNER. INCL. PETROGLYPHS AREA
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	TIMBER MTN NW ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	MT. DOME SW ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	MT. DOME NE ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	TULELAKE SE ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	MEDICINE LAKE NW ORTHOPHOTO QUAD. FILE AERIAL PHOT
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	TULELAKE SW ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	MEDICINE LAKE NE ORTHOPHOTO QUAD. FILE AERIAL PHOT
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	MEDICINE LAKE SE ORTHOPHOTO QUAD. FILE AERIAL PHOT
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	MEDICINE LAKE SW ORTHOPHOTO QUAD. FILE AERIAL PHOT
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	MT. DOME NW ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	TULELAKE NW ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	MT. DOME SE ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	TIMBER MTN SW ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	TULELAKE NE ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	TIMBER MTN NE ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1975	1	1:24,000	3	1	5	TIMBER MTN SE ORTHOPHOTO QUAD. FILED AERIAL PHOTO
LABE	AIR PHOTO	1974	2	1:15600	2	1	9	NOMINAL SCALE 1"=1300 FT. 2 COPIES OF MOST OF SET
LABE	AIR PHOTO		3	ca. 1:120,000	1	1	9	NO DATE (POSS. 1981)
LABE	AIR PHOTO	1978	3	1:124,333	1	1	9	NASA/EROS DATA CENTER. S HALF PURCHASED, NOT FOUND
LAME	AERIAL PHOTOS.		1	1:2400	3	1	1	COVERS ONLY DEVELOPED AREAS; VARIOUS DATES.
LAME	AERIAL PHOTOS	1970	1	1:30000 (?)	3	1	4	NEED RECENT PHOTOS AT LARGER SCALE. NEED COLOR.
LAME	AERIAL PHOTOS.	1982	1	1:5000	3	1	9	COVERS ONLY NORTH SHORE ROAD FOR ILLEGAL ORV USE.
LAME	AERIAL PHOTOS.	1979	2	1:6000 (?)	3	1	9	USEFUL, BUT ONLY COVER LAKESHORES.
LAME	SATELLITE	1976	3	UNKNOWN.	3	1	8	ATTEMPTS TO DERIVE VEG/GEOL UNSUCCESSFUL.
LAVO	USGS EROS							
LAVO	360 PANORAMA	1934	1	GROUND LEVEL	3	1	9	TURNER MTN FIRE LOOKOUT PHOTO. POSS. REFERENCE USE
LAVO	360 PANORAMA	1934	1	GROUND LEVEL	3	1	9	MT LASSEN FIRE LOOKOUT PHOTO. POSS. REFERENCE USE
LAVO	360 PANORAMA	1936	1	GROUND LEVEL	3	1	9	LATOUR BUTTE FIRE LOOKOUT. POSS. REFERENCE USE
LAVO	360 PANORAMA	1936	1	GROUND LEVEL	3	1	9	WEST PROSPECT FIRE LOOKOUT. POSS. REFERENCE USE
LAVO	360 PANORAMA	1936	1	GROUND LEVEL	3	1	9	BROKEOFF MTN FIRE LOOKOUT. POSS. REFERENCE USE
LAVO	AERIAL PHOTOS	1941	1	1:18000	1	1	8	NO SCALE ON PHOTOS. EST SCALE 1:17500 OR 1:19500
LAVO	AERIAL PHOTOS	1952	1	1:20000	1	1	8	NO SCALE ON PHOTOS. EST. SCALE 1:20000 OR 1:21000
LAVO	AIR PHOTOS	1954	1	ca.1:19000	3	1	9	COVERS W SIDE OF PARK, INCL. SNAG & JUNIPER LAKE
LAVO	AIR PHOTOS	1956	1	1:15000	3	1	9	USFS. MOSTLY NON-LAVO. SOME COVERAGE OF SW PART
LAVO	AERIAL PHOTOS	1966	1	1:15840	1	1	8	
LAVO	AIR PHOTOS	1968	1	ca. 1:6000	3	1	9	LAKE HELEN / EMERALD LAKE AREA
LAVO	AIR PHOTOS	1970	1	1:4800	3	1	9	MANZANITA LAKE AREA. HAMMON, JENSEN, & WALLEN
LAVO	AIR PHOTOS	1974	1	1:13000	3	1	9	EDGE OF MANZANITA LAKE AREA. MOSTLY USFS LAND
LAVO	AIR PHOTOS	1978	1	ca. 1:11000	3	1	9	SULPHUR WORKS / SKI AREA
LAVO	AIR PHOTOS	1978	1	1:9600	3	1	9	OBLIQUE. MANZANITA LAKE / BLUFF FALLS CAMPGROUND
LAVO	AIR PHOTO	1979	1	1:30,000	2	1	9	V7 9SRW, 26 JUL 79. MISSES STRIP OF N SIDE OF PARK
LAVO	AIR PHOTOS	1981	1	ca. 1:24000	3	1	9	TOWN OF MINERAL
LAVO	AERIAL PHOTOS	1973	2	1:15840	1	1	1	
LAVO	AIR PHOTOS	1978	2	1:9600	3	1	9	SULFUR WORKS / SKI AREA. GENGE AERIAL SURVEY
LAVO	AERIAL PHOTOS	1988	3	1:20000	3	1	8	ONLY COVERS EASTERN 50% OF PARK
MOCA	AERIAL PHOTOS	1946	1		0	0	0	
MOCA	AERIAL PHOTOS	1987	2	1:1600	0	0	0	MOCA AND ENVIRONS
MOCA	AERIAL PHOTOS	1987	2	1:1600	0	0	0	MONTEZUMA WELL AND ENVIRONS
MOCA	AERIAL PHOTOS	1987	2	1:200	0	0	0	ENVIRONS
MOCA	AERIAL PHOTOS	1987	2	1:2400	1	1	9	MONTEZUMA WELL AND ENVIRONS; KENNEY AERIAL MAPPING

PARK CODE	IMAGERY	DATE YEAR	TYPE	SCALE	COMP	REP	BACK UP COPY	COMMENTS
REDW	AERIAL PHOTOS	1975	1	1:10000	3	1		0 SOUTH AREA. AIR SURVEYS WEST, FORTUNA
REDW	AIR PHOTOS / NASA	1975	1	1:32,500	3	1		7 REDWOOD CREEK WATERSHED. COPY, STEVE VEIRS FILES
REDW	AERIAL PHOTOS	1975	1	1:10000	3	1		0 NORTH AREA. AIR SURVEYS WEST, FORTUNA
REDW	AERIAL PHOTOS	1976	1	1:10000	3	1		0 SOUTH AREA. AIR SURVEYS WEST, FORTUNA
REDW	AERIAL PHOTOS	1977	1	1:5000	3	1		0 1977-78. COASTAL AREA. AERIAL MAPPING CO., OREGON
REDW	AERIAL PHOTOS	1977	1	1:5000	3	1		0 1977-78. SOUTH AREA. AERIAL MAPPING CO., OREGON
REDW	PHOTO POINT	1978	1	ON GROUND	0	0		0
REDW	AERIAL PHOTOS	1978	1	1:12000	3	1		0 SOUTH AREA OF PARK
REDW	AIR PHOTOS-NASA/EROS	1978	1	1:35,000	3	1		5 REDWOOD CREEK WATERSHED. COPY IN STEVE VEIRS FILES
REDW	AERIAL PHOTOS	1978	1	1:12000	3	1		0 SOUTH AREA OF PARK. CONTRACTOR AIR PHOTO INC.
REDW	AERIAL PHOTOS	1978	1	1:6000	3	1		0 2X ENLARGEMENTS. SOUTH AREA OF PARK. AIR PHOTO INC
REDW	AERIAL PHOTOS	1981	1	1:1000	3	1		0 HUMBOLDT & DEL NORTE CO. CHICKERING-GREENE, EUGENE
REDW	AERIAL PHOTOS	1982	1	1:1200 & 1:6000	3	1		0 FRESHWATER LAGOON
REDW	AERIAL PHOTOS	1984	1	1:31680	2	1		0 MAY COVER AREA OUTSIDE PARK ALSO. WAC CORP., EUGEN
REDW	AERIAL PHOTOS	1988	1	1:6000	3	1		0 BYPASS, DAVIS - CRESCENT CITY
REDW	AIR PHOTOS / NASA	1975	2	1:32,500	3	1		7 REDWOOD CREEK WATERSHED. COPY, STEVE VEIRS FILES
REDW	AIR PHOTOS	1977	2	1:5000	3	1		9 REDWOOD CREEK, LITTLE LOSTMAN CREEK. COPY, S VEIRS
REDW	AIR PHOTOS	1977	2	1:5000	3	1		9 REDWOOD CREEK, LITTLE LOSTMAN CREEK. COPY, S VEIRS
REDW	AERIAL PHOTOS	1978	2	1:6000	3	1		0 SOUTH AREA OF PARK
REDW	AIR PHOTOS-NASA/EROS	1978	2	1:35,000	3	1		5 REDWOOD CREEK WATERSHED. COPY IN STEVE VEIRS FILES
REDW	AERIAL PHOTOS	1978	2	1:6000	3	1		0 NORTH HALF OF REDWOOD CR BASIN
REDW	AERIAL PHOTOS	1978	2	1:6000	3	1		0 SOUTH HALF OF REDWOOD CR BASIN
REDW	AERIAL PHOTOS	1981	2	1:6000	3	1		0 SOUTH AREA OF PARK. CONTRACTOR AIR PHOTO INC.
REDW	AIR PHOTOS / NASA	1975	3	1:32,500	3	1		7 REDWOOD CREEK WATERSHED. COPY, STEVE VEIRS FILES
REDW	AERIAL PHOTOS	1977	3	1:5000	3	1		0 REDWOOD CREEK & LITTLE LOSTMAN CREEK. COPY, VEIRS
REDW	AIR PHOTOS-NASA/EROS	1978	3	1:35,000	3	1		5 REDWOOD CREEK WATERSHED. COPY IN STEVE VEIRS FILES
REDW	AERIAL PHOTOS	1983	3	1:12000	2	1		0 1983-4. EXCL BALD HILLS AREA. MAY COVER AREA OUTS.
SAGU	AERIAL PHOTO	1936	1	UNKNOWN	3	1		9 RINCON MTN DISTRICT
SAGU	AERIAL PHOTO	1954	1	1:40000	3	1		9 RINCON MTN DISTRICT
SAGU	AERIAL PHOTO	1958	1	1:15840	3	1		9 MICA MOUNTAIN ONLY
SAGU	AERIAL PHOTO	1966	1	1:25000	3	1		9 RINCON DISTRICT
SAGU	AERIAL PHOTO	1970	1	1:3000	3	1		9 UNSURE OF PARK INVOLVEMENT; DAMN GOOD PORTION
SAGU	AERIAL PHOTO	1972	1	1:24000	3	1		7 HAPPY VALLEY
SAGU	AERIAL PHOTO	1972	1	1:24000	3	1		7 RINCON PEAK
SAGU	AERIAL PHOTO	1972	1	1:24000	3	1		7 AVRA QUAD
SAGU	AERIAL PHOTO	1972	1	1:24000	3	1		7 BROWN MOUNTAIN QUAD
SAGU	AERIAL PHOTO	1972	1	1:24000	3	1		7 GALLET FLAT
SAGU	AERIAL PHOTO	1972	1	1:24000	3	1		7 JAYNES QUAD
SAGU	AERIAL PHOTO	1972	1	1:24000	3	1		7 CAT MOUNTAIN QUAD
SAGU	AERIAL PHOTO	1972	1	1:24000	3	1		7 MICA MOUNTAIN AREA
SAGU	AERIAL PHOTO	1982	1	1=400	1	1		7 SHOWS ENTIRE TUCSON AREA, INCLUDES PARK
SAGU	AERIAL PHOTO	1986	1	1=1200	1	1		7 ALL TUCSON DISTRICT; ONLY EXTREME WEST RINCON DIST
SAGU	AERIAL PHOTO	1975	2	1:30000	3	1		9 RINCON DISTRICT ONLY
SAMO	ORTHOPHOTOQUADS	1977	1	1:12000	3	1		5 COVERS SOME QUADS FOR LA COUNTY.
SAMO	AERIAL PHOTOS	1988	2	1:12000	1	1		7 OBTAINED FROM LA & VENTURA COUNTIES.
SAMO	AERIAL PHOTOS	1980	3	1:12000	1	1		1 PRINTS AND TRANSPARENCIES AVAILABLE IN PARK.
SAMO	AERIAL PHOTOS	1984	3	1:24000	1	1		7 USED TO DEVELOP VEGETATION MAP.
SAMO	SATELLITE	1979	5	1:500000	1	1		5 PRINT FOR BANDS 4, 5, & 7 (INFRARED, BLUE, GREEN).
SAMO	SATELLITE	1983	5	1:500000	1	4		5 30 X 30 M CELLS; ALL 7 BANDS OF TAPED SCENE.
SAMO	SATELLITE	1985	5	1:500000	1	1		5 30 X 30 M CELLS; ALL 7 BANDS OF DIGITAL SCENE.
SEKI	AERIAL PHOTOS.	1973	1	1:15840	2	1		3 ONLY SET OF COMPREHENSIVE AERIAL PHOTOS AVAIL.
SEKI	ORTHOPHOTOS.	1989	1	1:24000	1	1		5 PHOTO YEARS VARY THROUGHOUT 1980'S.
TONT	AERIAL PHOTOS	1967	1	UNKNOWN	1	1		7 KATHY DAVIS MAY HAVE ANOTHER SET OF PHOTOS
TUZI	AERIAL PHOTOS	1987	2	1:2400	0	1		0 KEPT IN VC CONFERENCE ROOM AT MOCA
TUZI	AERIAL PHOTOS	1987	2	1:200	0	1		0 ENVIRONS
TUZI	AERIAL PHOTOS	1987	2	1:1600	0	1		0 ENVIRONS
WAPA	ORTHOPHOTO	1975	8	1:4800 (1"=400')	1	9		9 ONLY IMAG AT PAAR
WHIS	AIR PHOTO	1980	0	1:24000	2	8		9 CH2M-HILL JOB # R13513.24. INDEX ONLY - NO PHOTOS
WHIS	AIR PHOTO	1952	1	1:6000	1	1		9 PRIOR TO CONSTRUCT. OF DAM. NO INDEX OR OTHER INFO
WHIS	AIR PHOTO	1952	1	1:6000	1	1		9 PRIOR TO CONSTRUCT. OF DAM. NO INDEX OR OTHER INFO
WHIS	AIR PHOTO	1965	1	1:12000	1	1		9 BU REC TRINITY RIVER PROJECT. WITH INDEX
WHIS	AIR PHOTO	1967	1	1:4800	3	1		7 CALIF. DIV. HIGHWAYS. US 299 CORRIDOR THROUGH UNIT
WHIS	AIR PHOTO	1967	1	1:15840	1	8		9 HAMMON, JENSEN & WALLEN. INDEX ONLY, PHOTOS NOT SEEN
WHIS	AIR PHOTO	1973	1	1:15840	2	1		9 CH2M-HILL. INDEX, ENLARGEMENTS, PHOTOMOSAIC
WHIS	AIR PHOTO	1979	1	CA. 1:30,000	1	1		9 8 PHOTOS "V7 9SRW 178-2 27JUN79 SENIOR SMOKEY FOUD"

APPENDIX V

NOTES CONCERNING THE LIST OF PARKS WHICH DESIGNATED ENDANGERED, THREATENED AND RARE/SENSITIVE SPECIES

-The text file for each biological group was read, the hard copy of the species lists was examined and any disks brought back were scanned to obtain the following listing. Only lists with species clearly marked were counted as having done threatened and endangered species work. For example, if a park had a bird list with bald eagles listed but did not denote that they were an endangered species, then birds were not included for that park.

-Species that were State or Federally endangered or threatened, or that were category 1 or 2, were counted for the sake of this list.

-Several parks listed hypothetical threatened or endangered species; that is threatened or endangered species whose range includes the park, but there are no actual sightings of the species. These species were not included in the listing. Similarly, if a park definitely had a species, but the presence of the endangered subspecies was uncertain, then that park was not included.

-GOGA and WHIS have lists from the California Native Plant Society, which do not correspond to the Federal and State lists. (GOGA has 23 plants on their list and WHIS has 7 species on their list). GOGA has two other separate lists, but one is of very limited scope and the other list the CPSU/UCD does not have. There is one other list for WHIS from an environmental assessment.

-The species lists which could not be included in this appendix due to space considerations are all available at the respective parks.

APPENDIX V CONTINUED

THREATENED, ENDANGERED OR RARE SPECIES FOUND IN 40 PARKS OF THE WESTERN REGION (ALL BIOLOGICAL GROUPS CONSIDERED)

<u>PARK NAME</u>	<u>BIOLOGICAL GROUP</u>	<u>NO. SPP</u>	<u>REFERENCES AND COMMENTS</u>
GOGA	PLANTS, T&E/SENS	4	WILMA FOLLETTE, MARIN CHAPTER, CNPS ONLY FOR AIR FORCE SITE ON MT TAMALPAIS
GOGA	REPTILES, T&E/SENS	3	WHITE, 1974. T&E + CATEGORY 2 SPP.
HALE	BIRDS, T&E	12	USFW 1/90 LISTING. 7 ARE TRUE T&E, 5 ARE CATEGORY 2 SPP
HALE	MAMMALS, T&E	1	PARK RECORDS/SIGHTINGS. ENDNG - HAWAIIAN HOARY BAT
HALE	PLANTS, SENS	108	IN HOUSE LIST, RARE/SENSITIVE PLANTS
HALE	REPTILES, T&E	2	NO REFS/RECORDS, JUST SIGHTINGS. 2 SPP: HAWKSBILL (ENDANGERED), GREEN SEA TURTLE (THREATENED)
HALE	TERR. INVERTS	13	NO REFS/RECORDS. MANY NEW SPP W/IN 10 YRS, COULD INCREASE AMOUNT OF RARE/T&E SPP
HAVO	BIRDS, ENDNG	3	RESOURCE MANAGEMENT SPECIALIST MADE LIST.
HAVO	MAMMALS, T&E	1	RESOURCE MANAGEMENT PLAN, AND PARK RECORDS ENDNG - HAWAIIAN HOARY BAT
HAVO	PLANTS, SENS	32	SPORADIC COLLECTIONS
HAVO	REPTILES, T&E	2	INCIDENTAL SIGHTINGS & NESTINGS RECORDED SINCE 1976. 2 SPP: HAWKSBILL (ENDANGERED), GREEN SEA TURTLE (THREATENED)
JOTR	PLANTS, T&E	?	LEARY 87 CPSU REPORT. NOT A SYSTEMATIC SURVEY, ONLY SEARCHED KNOWN OCCURRENCE AREAS.
KAHO	BIRDS, T&E	3	3 SPP OF ENDANGERED BIRDS
KAHO	MAMMALS, T&E	2	SIGHTINGS. HAWAIIAN HOARY BAT; HUMPBACK WHALE-BELIEVED TO REST OFFSHORE
KAHO	REPTILES, T&E	2	PARK SIGHTINGS AND REPORTS. 2 SPP: HAWKSBILL (ENDANGERED), GREEN SEA TURTLE (THREATENED - BUT COMMON HERE)
KALA	PLANTS, SENS	25	CLIFF SMITH. 25 RARE PLANT SPP.

APPENDIX V CONTINUED
THREATENED, ENDANGERED OR RARE SPECIES FOUND IN 40 PARKS OF
THE WESTERN REGION (ALL BIOLOGICAL GROUPS CONSIDERED)

<u>PARK NAME</u>	<u>BIOLOGICAL GROUP</u>	<u>NO. SPP</u>	<u>REFERENCES AND COMMENTS</u>
SAMO	AMPHIBS, SENS	3	DELISLE, 1986. ALL 3 ARE CATEGORY 2 SPECIES
SAMO	BIRDS, SENS	5	GARRETT, 1981. ALL 5 ARE CATEGORY 2 SPECIES
SAMO	FISH, SENS	1	1974, LA COUNTY MUSEUM NAT HISTORY. 1984 MCGINNIS. TIDEWATER GOBY, CATEGORY 2
SAMO	TERR INVERTS	6	LA COUNTY MUSEUM NAT HISTORY, EMMEL 1973, CA FISH & GAME. ALL 6 ARE CATEGORY 2 SPECIES
SEKI	PLANTS, T&E/SENS	?	LARRY NORRIS, FROM DSC.
TONT	BIRDS, T&E	1	SIGHTINGS AND PHOTOS. SPOTTED OWL SEEN IN 1988 & 1989
WACA	BIRDS, T&E	1	GANEY, 1988, DID EXCELLENT STUDY ON MEXICAN SPOTTED OWL
WHIS	BIRDS, T&E	1	ENVIRONMENTAL ASSESSMENT, AUGUST 1988. BALD EAGLE
WHIS	PLANTS, T&E/SENS	1	ENVIRONMENTAL ASSESSMENT, AUGUST, 1988. CAT 2 SPP; CNPS CALLS 7 SPP RARE, CFWS/USFWS CALLS 1 RARE - Arnica venosa
YOSE	AMPHIBIANS, SENS	5	1 RARE, 4 SPECIAL STATUS.
YOSE	BIRDS, T&E	4	S. BALD EAGLE, PEREGRINE, GREAT GREY OWL, S. SPOTTED OWL
YOSE	MAMMALS, T&E	7	RESOURCE SCIENTIST, YOSE HOUSING STUDY (1/1/90) THREATENED + SPECIAL CONCERN SPP
YOSE	PLANTS, RARE	7	5 RARE SPP, 2 CATEGORY 2.
YOSE	TERR INVERTS	2	1/1/90 IMPACT OF YOSE VALLEY HOUSING REPLACEMENT; BOHART'S BLUE BUTTERFLY & SIERRA PYGMY GRASSHOPPER; BOTH CATEGORY 2