

**VASCULAR PLANT SPECIES LIST DOCUMENTATION
FOR SEQUOIA AND KINGS CANYON NATIONAL PARKS**

Cooperative agreement between California State University, Fresno and the National Park Service
through the Great Basin Cooperative Ecosystem Studies Unit



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Vascular Plant Species List Documentation For Sequoia and Kings Canyon National Parks

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EXECUTIVE SUMMARY

National Park Service (NPS) Management Policies and recent legislation require that park managers know the condition of natural resources and monitor long-term trends in order to fulfill the NPS mission of conserving parks unimpaired. The NPS has developed an Inventory and Monitoring program to fill in knowledge gaps in baseline data about natural resources. One of the main objectives of the biological inventory phase of this program is to document the occurrence of at least 90 percent of vertebrates and vascular plants. In response to this mandate, resource managers at Sequoia and Kings Canyon National Parks identified the vascular plant species list as deserving of attention in order to verify that the species list is accurate and current.

The purpose of this project was two-fold: 1) to locate and document all vascular plant specimens collected within Sequoia and Kings Canyon National Parks residing in key western herbaria, and 2) to generate a checklist of the vascular flora of the two parks based on known collections. To accomplish these goals several intermediate steps were taken as follows:

1) Documented all vascular plant specimens collected within Sequoia and Kings Canyon National Parks and housed within the local Sequoia and Kings Canyon National Parks (SEKI) Herbarium. The SEKI Herbarium serves as the single largest collection of vouchers for the two parks containing over five thousand vascular plant vouchers collected within the parks. As the herbarium's collections information is available digitally, vascular plant specimen data was downloaded from the Museum's database. Specimens collected in the parks were identified by evaluating collection location information. In addition, several hundred vouchers were manually examined to either update the specimen's nomenclature or document more collection information.

To further support documenting vascular plant vouchers associated with the SEKI Herbarium, over a thousand vouchers were accessioned into the herbarium from a backlog of vascular plant vouchers collected by various park-related projects.

2) Located and documented vascular plant specimens collected within Sequoia and Kings Canyon National Parks but housed within regional herbaria. This was accomplished by requesting digital specimen records from curators, searching web-based on-line holdings and visiting regional herbaria. As it was not within the scope of this project to investigate every herbarium suspected to contain collections from Sequoia and Kings Canyon National Parks, attention was mainly focused on facilities known to contain large numbers of collections from the parks; the University and Jepson Herbaria in Berkeley, California Academy of Sciences in San Francisco, Rancho Santa Ana Botanic Garden in Claremont, Carl W. Sharsmith Herbarium in San Jose, University of California Davis Herbarium in Davis, Chico State University Herbarium in Chico and Fresno State College Herbarium in Fresno.

Specimen information was requested from herbaria that provide a portion or all of their holdings digitally. Staff from the University and Jepson Herbaria, the Carl W. Sharsmith Herbarium, Rancho Santa Ana Botanic Garden and the University of California Davis Herbarium provided databases filled with specimen information. Databases provided were a subset of each herbarium's substantial holdings. Furthermore, a database from a thesis project documenting the flora of the Kings River Basin provided specimen information for holdings at Fresno State College Herbarium. Specimens were identified as collected in the parks by evaluating collection location information.

In addition, three regional herbaria were visited and their collections hand searched for vouchers collected within the parks which had not been documented. Searching collections at regional herbaria resulted in documenting 33 previously undocumented taxa.

3) Updated the existing vascular plant species checklist for Sequoia and Kings Canyon National Parks to reflect current nomenclature, accurate spelling, consistent naming and coding conventions. One goal when we began this project was to rectify known mistakes in spelling and nomenclature present in the parks species checklist.

Prior to this update, the nomenclature of the checklist was that of Hickman (1993) which has since become out-of-date as a result of phenomenal progress in the field of plant systematics. To bring the checklist up to date, the Jepson Online Interchange for California Floristics was used as the Jepson

Interchange represents the latest information on identification, taxonomy, nomenclature, distribution, ecology, relationships and diversity of California vascular plants. Staff from the University and Jepson Herbaria provided a list of all accepted taxa on the Jepson Online Interchange for California Floristics, including the associated USDA PLANTS code, nativity status and common name(s). A second file listing the Taxonomic Serial Number for all plants in North America from the Integrated Taxonomic Information System website was downloaded. The USDA PLANTS code and Taxonomic Serial Number are codes that uniquely identify species in regional and national contexts. These files were linked to the parks checklist database and the checklist was updated with current nomenclature and appropriate codes for comparison to regional and national databases.

It is important to note that optimally, when documenting a flora, each voucher specimen is examined and its identification verified. As time was limited, we did not examine all holdings in regional herbaria or in the Sequoia and Kings Canyon National Parks Herbarium. Although many of the collections documented in this report were located and examined in hand, we collected most vascular plant voucher information from digital records provided by regional herbaria. From the outset, we accepted that all holdings in the SEKI Herbarium were verified prior to 1984 by NPS botanist, Larry Norris, to the current nomenclature of the time which was that of Munz (1959, 1968). In 1994, collections in the SEKI Herbarium were electronically updated to the current nomenclature of Hickman (1993) by a file provided by NPS research staff. All additions to the vascular plant checklist since 1984 have been verified by either a subject matter expert or through comparison with holdings at an outside herbaria.

The main focus of this project was to document all vascular plant specimens collected within Sequoia and Kings Canyon National Parks and to generate a checklist of the vascular flora of the two parks based on known collections. To that end the following database tables were constructed to compile specimen data from local and regional herbaria: 1) a table containing voucher specimen records collected in Sequoia and Kings Canyon National Parks and 2) a table containing information regarding the presence of vascular plants in Sequoia and Kings Canyon National Parks. These database tables were constructed to mirror the Inventory and Monitoring database, called NPSpecies, which documents the present, past or probable occurrence of vertebrates and vascular plants in National Park Service Units. This information was submitted to the Inventory and Monitoring Point of Contact for submission to NPSpecies staff. The data is currently in review for the NPSpecies certification process before being uploaded to the national database.

In addition, this project also addressed accessioning voucher specimen into the local SEKI Herbarium. A database was created to accession vascular plant specimen collections into the herbarium which was designed to be compatible with the Museum's collections database.

This project has been successful in the following: 1) providing an updated and accurate checklist of the vascular plants of Sequoia and Kings Canyon National Parks by updating the checklist to reflect current nomenclature and providing USDA PLANTS code and Taxonomic Serial Number to uniquely identify species in regional and national contexts. Sixty seven taxa were also added to the parks vascular plant species checklist by locating and examining specimens at regional herbaria as well as reevaluating the checklist which resulted in removing 10 taxa.

2) Gathering specimen data collected in Sequoia and Kings Canyon National Parks from key western regional herbaria. Through this process, 11,199 vascular plant voucher specimen records were compiled into a database; 7,409 from Sequoia National Park, 3,735 from Kings Canyon National Park and 55 from Sequoia and Kings Canyon National Parks (specimens collected along the boundary between Sequoia and Kings Canyon).

3) Generating a checklist of the vascular flora of the two parks based on known collections. The Sequoia and Kings Canyon National Parks vascular plant species checklist contains 1,545 taxa in 108 families; 188 of these, or 12%, are non-native. Voucher specimens for 1,382 taxa (or 89% of the total flora) are housed in the park herbarium. Another 108 taxa are represented by vouchers residing in regional herbaria, bringing total number of vouchered taxa to 1,490 (or 96% of the total reported flora).

Vascular Plant Species List Documentation for Sequoia and Kings Canyon National Parks

SECTION 1 – INTRODUCTION

1.1 Inventory and Monitoring Program

National Park Service (NPS) Management Policies (National Park Service 2001) and recent legislation (National Parks Omnibus Management Act 1998) require that park managers know the condition of natural resources under their stewardship and monitor long-term trends in those resources in order to fulfill the NPS mission of conserving parks unimpaired. The NPS has developed an Inventory and Monitoring program to fill in gaps in our knowledge about natural resources, and to design and implement a monitoring program that will enable managers to develop broad-based, scientifically sound information on the current status and long term trends in the composition, structure and function of park ecosystems (Fancy 2004).

To improve the efficiency of the Inventory and Monitoring program, the NPS created networks of parks that are linked by geography and shared natural resource characteristics. There are 32 networks nationwide. The Sierra Nevada Network includes three NPS administered units in California: Devils Postpile National Monument, Sequoia and Kings Canyon National Parks and Yosemite National Park.

One of the main objectives of the biological inventory phase of this program is to document the occurrence of at least 90 percent of vertebrates and vascular plants currently estimated to occur in each park, through existing verifiable data and field surveys (Wotawa 2004). Locating vouchers to validate park's species lists are a beginning step to document occurrences of species. The Inventory and Monitoring program has developed a species database, called NPSpecies to document the present, past, or probable occurrence of vertebrates and vascular plants in NPS units. NPSpecies is a relational database designed to store, manage and disseminate scientific information on the biodiversity of organisms in National Park Service units throughout the United States and its territories. Although much is known about the vascular plant flora of the Sierra Nevada network parks, complete information sufficient to thoroughly document plant vouchers in NPSpecies is not available in all cases.

Biologists in the Sierra Nevada Network (Sierra Nevada Network 2001) identified vascular plant species list documentation as a high-priority for the network parks. Inventory funds to date have been used primarily to document Yosemite's vascular plant species list (National Park Service 2003b). To address the need for a similar effort to document Sequoia and Kings Canyon's vascular flora, the National Park Service entered into a cooperative agreement with Fresno State College in 2003.

This *Vascular Plant Species List Documentation* project provides an updated and accurate checklist of the vascular plants of Sequoia and Kings Canyon National Parks as well as a record of known vouchers housed in key herbaria.

SECTION 2 – GOALS AND OBJECTIVES

2.1 Sequoia and Kings Canyon Species List Documentation Project Goals

The goals of this project were two-fold: 1) to locate and document all vascular plant specimens collected within Sequoia and Kings Canyon National Parks and residing in key western herbaria, and 2) to generate a checklist of the vascular flora of the two parks based on known collections.

The objectives of this project were as follows:

1. To document all vascular plant voucher specimens collected within Sequoia and Kings Canyon National Parks and housed within the local Sequoia and Kings Canyon National Parks Herbarium.
2. To locate and document vascular plant specimens collected within Sequoia and Kings Canyon National Parks but housed within regional herbaria.
3. To update the existing vascular plant species checklist for Sequoia and Kings Canyon National Parks to reflect current nomenclature, accurate spelling, consistent naming and coding conventions.

We began this project evaluating vouchers housed in the Sequoia and Kings Canyon National Parks Herbarium as most of the specimens on the parks vascular plant checklist are represented there. Then we expanded our search to include regional herbaria known to have vouchers residing in them by either requesting digital specimen records from curators, searching web-based on-line holdings, or performing site visits.

Optimally, when documenting a flora, each voucher specimen is examined and its identification verified. It is important to note that as time was limited, we did not examine all holdings in regional herbaria or in the Sequoia and Kings Canyon National Parks Herbarium. Although many of the collections documented in this report were located and examined in hand, we collected most vascular plant voucher information from digital records provided by regional herbaria.

SECTION 3 – BACKGROUND

3.1 Sequoia and Kings Canyon National Parks Herbarium

The Sequoia and Kings Canyon National Park (SEKI) Herbarium houses over five thousand vascular plant voucher specimens collected from within and around the parks. During the early 1900's, the herbarium was first established with collections residing in the parks superintendent's home. Over the decades, the collections have migrated to several locations in the park but in 1974 the collections were moved to the present location in the basement of the Ash Mountain Visitor Center located at park headquarters.

Several key events led to the disposal or destruction of vascular plant voucher collections residing in the SEKI Herbarium. The following describes the three key events and subsequent efforts to rebuild the collections. Much of the following was written by Sequoia and Kings Canyon National Parks museum staff (Eldredge 2005).

The Fire of 1917

The organized collecting and exhibiting of natural history material at Sequoia National Park began sometime in the early years of the last century. While specifics are vague, it is known that in August of 1917, a wildfire destroyed park superintendent Walter Fry's Three Rivers residence and headquarters along with "over 4,000 specimens of the flora of the Sequoia and General Grant National Parks that had been collected and prepared for use in an exhibit of the flora of the parks." (National Park Service File Report 1917). At the time, Fry was the caretaker of the museum collections and seems to have been the principal collector. After the fire, Fry began to rebuild the collections. Fry's successor, Col. John R. White, reported at the end of the 1920 season that the floral displays which had been maintained in the entrance to the superintendent's office would "form the nucleus of the Park Museum, to be established when appropriation is available for the necessary building." (National Park Service File Report 1920). From the outset, the creation, display and maintenance of museum collections were conceived of as an aspect of the visitor experience; despite subsequent operational reorganization, the responsibility for curation has remained within the Division of Interpretation.

The Prospectus of 1941

In August of 1941, a Museum Prospectus and Exhibit Plan for Sequoia National Park was approved. The Prospectus defined for the museum's "central and dominant theme" the Giant Sequoias, and secondarily the geology and history of the park (Fryxell and Oberhansley 1941). The botanical specimens collected by Fry and other ranger naturalists, at the time constituting a third of the museum's holdings, were considered of relatively little importance: "Botanical features other than those relating to the Giant Sequoia can, despite their great interest, be interpreted adequately by other educational means, such as lectures, nature trails, and guided hikes." It would appear that the park's herbarium was disposed of at this time. The manner in which the collections were disposed is not known. In the herbarium today there is only one specimen collected by Walter Fry and 75 vascular plant specimens collected before 1940.

While not all recommendations were adopted, the Prospectus of 1941 marks the beginning of a formal museum management program for Sequoia National Park. Under Sequoia Park Naturalist Oberhansley, attempts were made to inventory and catalog museum holdings and to tighten the focus of the collections. In 1955, the Park Service implemented the Museum Properties Management Act; the accession book currently in use at Sequoia and Kings Canyon dates to this period, evidently begun sometime between 1956 and 1958. Renewed interest in natural history collection outside the groves of sequoias also dates to this period. With the efforts of naturalists Samuel Pusateri and Steve Stocking, the herbarium was begun for a third time.

In March of 1966, the Giant Forest Museum was closed and the exhibits moved to the new Lodgepole Visitor Center. The building shell was then demolished and burned. By 1971, the museum contained 1,300 accessioned and cataloged objects under the administration of the Park Interpreter to whom fell the duty of cataloging the backlog of objects and of keeping the records up to date. In 1974, the collections were moved to the Ash Mountain Visitor Center.

Deaccessioned Specimens

In the collections today, approximately 445 of 6,432 vascular plant collections are reported as deaccessioned in the herbarium's museum collections database. Deaccessioning a specimen is the process of permanently removing NPS museum collections from an NPS unit's ownership and custody. These collections were disposed of, removed, or destroyed. The manner in which these collections were deaccessioned is not known (Appendix B).

In more recent times, several steps led to updating the herbarium's vascular plant collections to currently accepted nomenclature. The following describes the events to update the collection's nomenclature by manual examination and subsequent electronic update of the collection's nomenclature stored in the herbarium's museum collections database.

In 1984, NPS botanist Larry Norris examined each vascular plant collection held in the SEKI Herbarium. His work included confirming determinations and annotating each specimen according to the accepted nomenclature of the time, which was that of Munz (1959, 1968). Norris' work took place before the SEKI Herbarium stored and managed collections data electronically.

In May of 1998, museum staff began using a National Park standardized database to store and manage all museum collections data. The Automated National Catalog System (ANCS) is a database management system developed by NPS to accession and catalog NPS museum collections. SEKI museum staff continue to use this database software to manage the collections data.

In late 2001, all vascular plant voucher records in ANCS+ were updated to the currently accepted nomenclature of Hickman (1993). This translation from Munz to Hickman nomenclature was based on

a table created by NPS research staff in 1994; note that this process relied on published synonymy and did not include a manual examination of each specimen in the herbarium (National Park Service 1995, National Park Service 2003a).

3.2 Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist

The following was taken from the Sierra Nevada Network, Biological Inventory Plan (2001) and describes the development of the vascular plant species checklist.

The first comprehensive checklist of the vascular plants of Sequoia and Kings Canyon National Parks was compiled by Stagner in 1951. Based largely on collections made by the eminent botanist John Thomas Howell from 1940 to 1950, that early list included 83 plant families and 1,159 taxa. In 1969, Rockwell and Stocking published a revised and annotated Checklist of the Flora, Sequoia and Kings Canyon National Parks, which included 2,175 taxa within 120 families. This expanded list included not only those species with documented occurrences within the parks, but also those that were likely to occur, based on range data presented in the comprehensive statewide flora of the time (Munz 1959, 1968). This list is thus considered a checklist of the potential flora of SEKI. Norris and Brennan (1982) conducted surveys for 30 high priority sensitive plant taxa known to occur in SEKI. Their work included examining vouchers held in collections at Rancho Santa Ana, California Academy of Sciences, University of California at Berkeley, Davis, and Los Angeles, Fresno State College, San Jose State College, Stanford University and the Jepson Herbarium at Berkeley. In 1984, Norris revised the checklist of Rockwell and Stocking to include only those taxa with known, documented locations within the two parks. This reduced the number of taxa to 1,243 within 95 families. His work included thoroughly examining each collection held in the SEKI vascular plant herbarium, including confirming determinations and annotating each specimen according to the current nomenclature of the time, which was that of Munz (1959, 1968).

The more conservative list of Norris formed the basis for the current checklist, developed by Graber *et al.* as part of the Natural Resource Inventory begun in 1985. Building on the works of Stagner, Rockwell and Stocking, and Norris, Graber and his colleagues conducted further literature reviews and limited searches of outside herbaria for documented additions to the flora.

As mentioned above, the original nomenclature for the checklist of the flora of Sequoia and Kings Canyon National Parks followed that of Munz (1959, 1968), the accepted authority for the California flora from 1959 to 1993, when the revised Jepson Manual was published (Hickman 1993). In 1994, the SEKI checklist was updated to reflect the nomenclature of Hickman (1993). Since the publication of the *The Jepson Manual* in 1993, significant advances in systematic botany have been made and new species have been identified. The rapid pace of new floristic and systematic discoveries and the need to make this information available to a wide array of users, led botanists at the Jepson Flora Project to develop the Jepson Online Interchange for California Floristics (Section 7). The Interchange provides the latest information on identification, taxonomy, nomenclature, distribution, ecology, relationships and diversity of California vascular plants. “Although the 1993 edition of *The Jepson Manual* was published only 10 years ago, it is rapidly becoming out-of-date as a result of the phenomenal progress in plant systematics. Some significant taxonomic changes have already been made and others are on the horizon; it is estimated that 57% of the families in the 1993 edition of *The Jepson Manual* will require substantial revision. The development of the Online Interchange was the first step toward producing a Second Edition of *The Jepson Manual*.” (cited from Jepson Herbarium website).

3.3 Regional Herbaria

Botanists have collected vascular plants from throughout the Sierra Nevada's for over 150 years. Throughout the last century, collections have been deposited into many different herbaria with many deposited in known herbaria located in California.

As noted in Section 3.2, limited searches of regional herbaria for voucher specimens from Sequoia and Kings Canyon National Park were completed in the early 1980s. Since that time, many of the regional herbaria have posted their holdings on-line, or are able to perform queries for specific areas to generate a listing of collections from a given park or reserve. More thorough searches of earlier holdings within these herbaria were needed to document vouchers collected in Sequoia and Kings Canyon National Parks as well as for any collections made since that time to document taxa not currently on the parks species checklist.

As it was not within the scope of this project to investigate every herbarium either known or suspected to contain collections from Sequoia and Kings Canyon National Parks, we focused our attention on seven primary collections. The following describes the background of regional herbaria that were contacted and/or visited during this project; much of the following text was taken from each herbarium's respective website if available (Section 7).

California Academy of Sciences, San Francisco

The herbarium of the California Academy of Sciences (CAS) is the largest collection of vascular plants in the western United States. It is the sixth largest collection in the United States and includes approximately 1.84 million plant specimens. More than 95% of the specimens are vascular seed plants; the remainder are ferns and a growing collection of bryophytes. There are more than 10,400 types (holotypes, isotypes, syntypes, lectotypes, and neotypes) housed separately from the general collection, in a fireproof, cement vault. The collection was built largely as the result of research collections by the curators and staff of CAS and the Dudley Herbarium and augmented by purchases, exchanges, and bequests made over the years. The collection is strongest in vascular plants from North and Latin America (particularly California and western and southern Mexico) and the Galapagos Islands, as well as important collections from other areas of the world.

Carl W. Sharsmith Herbarium at San Jose State University, San Jose

The Carl W. Sharsmith Herbarium consists largely of California native plants and contains 15,000 herbarium specimens, many of which Dr. Sharsmith collected. Dr. Sharsmith made the final determinations of each species and personally mounted each one so that key characteristics are easily seen. He also wrote the labels based on information provided by each collector. Information from the labels of the 15,000 sheets has been entered in a database and is retrievable on-line. In 2002, the nomenclature of the on-line database was updated to that of Hickman (1993).

Chico State University Herbarium at California State University, Chico

The Biological Sciences Herbarium at California State University, Chico is the most complete repository of plant specimens from northeastern California. The emphasis is on the local flora, and includes a number of rare, threatened, and endangered plant species. Established with specimens donated by the late Professor Vesta Holt in the 1950's, the herbarium now contains more than 90,000 dried and mounted plant specimens. The majority of samples are flowering plants, conifers, and ferns, but bryophytes, lichens, and especially slime molds, are also well represented.

Fresno State College Herbarium at California State University, Fresno

The Fresno State College Herbarium was established in 1925 and contains 39,000 mounted herbarium specimens. The collection emphasizes the central and southern Sierra Nevada's, the San Joaquin

Valley, central coast range and northern Mojave Desert. Major collectors include Chas. H. Quibell, John Weiler, Steve Stocking, Philip A. Munz, John Stebbins and Joanna Clines.

Rancho Santa Ana Botanic Garden, Claremont

Rancho Santa Ana Botanic Garden is a native plant garden with collections largely consisting of California plants. In the mid to late 1960's the director, Philip A. Munz, completed integrating the Garden's collections with those of Pomona College creating a larger, stronger encompassing collection. The combined herbarium is about the tenth largest in the United States and the third largest in the western U.S., with current holdings totaling over one million specimens. The Garden's Herbarium is recognized throughout the world for its strength in plants of California which constitute nearly 40% of the total collection.

University and Jepson Herbaria at University of California, Berkeley

The University and Jepson Herbaria, housed at the University of California at Berkeley, represent the largest collection of herbarium material west of the Missouri Botanical Garden and the largest at a public university in the United States with a current combined total of approximately 1.8 million accessioned specimens. All plant groups are represented in the University Herbarium which has a worldwide scope and particular strengths in marine algae, bryophytes, pteridophytes and flowering plants. The Jepson Herbarium comprises a separate, privately endowed collection of about 87,000 specimens of vascular plants of California.

The University and Jepson Herbaria also provide information for many of their holdings on-line. The Specimen Management System for California Herbaria (SMASCH), completed the development of a database of text data and images of specimens that document the distribution and classification of the plants of California. Since the project began in 1992, information from over 300,000 specimens from the University and Jepson Herbaria has been entered. SMASCH allows users to perform several types of queries to generate listings of collections; such as queries for accession records, queries for collecting event data and queries for county level distribution (Section 7).

University of California Davis Herbarium at University of California, Davis

The University of California Davis Herbarium is comprised of several herbaria that were once housed separately. The majority of specimens originally belonged to either the Tucker Herbarium or the Beecher Crampton Herbarium Collection.

Today the Tucker Herbarium contains approximately 250,000 mounted and unmounted specimens. The collections are from all parts of the world, with the majority from California (especially the Central Valley, the Sierra, and the Sonoran and Mohave Deserts), other parts of the United States, Mediterranean Europe, Mexico, and Ecuador.

Between 1999 and 2000, the University of California Davis Environmental Horticulture Herbarium was curated and incorporated into the Tucker Herbarium, adding thousands of valuable California garden plants. In 2001, the University of California Davis Viticulture Herbarium was saved from disintegration and added to the Tucker Herbarium. This valuable viticulture collection documents what grape cultivars have been grown in California since 1885.

The Crampton Collection comprises about 55,000 mounted and unmounted specimens. Between 1997 and 2000, the Crampton Collection was intercalated with the Tucker Herbarium, and the grasses of both collections were brought up to date in terms of their scientific names.

SECTION 4 – METHODS

4.1 Sequoia and Kings Canyon National Parks Herbarium Collections

The local herbarium contains over five thousand vascular plant voucher specimens collected within Sequoia and Kings Canyon National Parks, and thus serves as the single largest collection of vouchers for the two parks. Documenting those vouchers residing in the local SEKI Herbarium was the top priority for this project. We evaluated the herbarium's vascular plant collections by examining the herbarium's database and by making site visits to gather information on specific vouchers collected within the parks.

All SEKI Herbarium natural history collection records were exported from the SEKI museum collections database, ANCS+, and imported into a database (Appendix C). Plant voucher records were identified and exported into a vascular plant voucher table within the database. The collection location for each voucher record was individually evaluated and each record was assigned the appropriate park acronym corresponding to the collection location, when applicable. The SEKI Herbarium database houses a total of 5,398 vascular plant vouchers collected within Sequoia and Kings Canyon National Parks: Sequoia National Park (3,459 vouchers), Kings Canyon National Park (1,893 vouchers) and Sequoia and Kings Canyon National Parks (46 vouchers; typically these were specimens collected along the boundary between the two parks).

4.2 Vascular Plant Vouchers to be accessioned in the Sequoia and Kings Canyon National Parks Herbarium

When we began this project, a backlog of several hundred vascular plant vouchers needed to be accessioned into the local SEKI Herbarium. We addressed accessioning these collections in the herbarium in order to provide additional evidence records to document vascular plant vouchers collected within the parks (Appendix D).

A database was created and filled with 1,295 voucher records generated by the following projects: SEKI Vegetation Mapping (505 vouchers), SEKI Special Status Plants Surveys (50 vouchers), United States Geological Survey Fire and Fire Surrogate Study (44 vouchers), Kings River Flora project (335 vouchers), SEKI Natural Resource Inventory project (286 vouchers), SEKI Alien Species Project (10 vouchers) and various botanist collections (65 vouchers). These voucher specimens have been filed in the SEKI Herbarium and the associated collections data delivered in digital format to the SEKI Museum Technician, Ward Eldredge.

4.3 Updating the Vascular Plant Species Checklist of Sequoia and Kings Canyon National Parks

One objective of this project was to rectify known mistakes in spelling and nomenclature present in the parks species checklist. We corrected these errors and modified the parks species checklist to reflect current nomenclature and naming conventions.

Prior to this update, the nomenclature of the checklist followed that of Hickman (1993) which has since rapidly become out-of-date as a result of phenomenal progress in the field of plant systematics. To bring the checklist up to date, the Jepson Online Interchange for California Floristics was used, as it represents the latest information on identification, taxonomy, nomenclature, distribution, ecology, relationships and diversity of California vascular plants. Dr. Richard Moe (Appendix A.4) from the University and Jepson Herbaria, University of California at Berkeley provided a list of all accepted taxa on the Jepson Online Interchange for California Floristics, including the associated USDA PLANTS code, nativity status and common name(s) (Appendix E). The file was converted into a database table which was then used to

update the parks species checklist with current nomenclature, accurate spelling and consistent naming conventions (Appendix F).

We also updated each taxon on the checklist with the USDA PLANTS code (Appendix G) and the Integrated Taxonomic Information System Taxonomic Serial Number (TSN) (Appendix H) to facilitate comparison with other regional databases. NPSpecies uses the Standard Classification System for taxonomy and nomenclature (Section 7). The Standard Classification System is based on a unique number, or TSN, that is assigned for each name of each taxonomic rank. Under this system, each kingdom, ..., each genus, each species, each subspecies, etc. are recognized by a unique number (TSN).

4.4 Complete, Accurate and Documented Taxa on the Vascular Plant Species Checklist

The main focus of this project was to locate vouchers to fully document the parks vascular plant checklist. We also wanted to make sure that the checklist of the vascular flora of the two parks was complete and accurate by locating vouchers to document the checklist and then examine reasons why taxa were included on the checklist in which a voucher had not been located. The following describes the methods to accomplish these tasks.

Several intermediate steps were taken to assess the accuracy of the checklist. First, we searched the local SEKI Herbarium collections to determine which taxa on the parks species checklist were not documented by known voucher specimens. This effort revealed 226 non-vouchered taxa. Uncataloged SEKI Vegetation Mapping specimen collections, Natural Resource Inventory plot specimens and Alien Species project specimen collections were hand-searched for needed vouchers in addition to searching regional herbaria on-line databases. Forty five taxa were documented through the SEKI Vegetation Mapping specimens, 2 through the Natural Resource Inventory specimens, 10 through the Alien Species project specimens and 53 taxa were documented from regional herbaria on-line resources. In addition, local taxa were collected and resulted in documenting seven additional taxa. All unmounted specimens were mounted and accessioned into the SEKI Herbarium. These efforts (hand-searching uncataloged specimens, searching regional herbaria on-line databases and collecting local taxa) resulted in documenting 117 taxa, thus reducing the number of taxa on the parks species list for which a voucher had not been located to 109.

These 109 taxa were then reviewed to determine the basis for including them on the parks checklist. The parks species checklist database documents collection location and collector source information for each taxon reported to occur within Sequoia and Kings Canyon National Parks. Taxa which were reported as collected in the parks and residing in the park herbarium as well as taxa without collection information in the parks species checklist database were manually searched for in the SEKI Herbarium. Taxa which were reported as collected in the parks and residing in the park herbarium were located, but in evaluating the collection location information were in actuality, not collected in the parks.

At the beginning of the 2004 field season, a list of 162 taxa known to occur within the parks yet not represented in the SEKI Herbarium was created. This list included all taxa that needed to be documented including taxa that were only documented at regional herbaria, and thus should be collected locally to augment the SEKI Herbarium holdings. This list was sent to select SEKI staff along with a request for their help in collecting these taxa during the 2004 field season. Taxa collected were verified, mounted and accessioned into the SEKI Herbarium. A total of 34 taxa were collected, 6 documented a previously undocumented taxon and 28 augmented the SEKI Herbarium collections. This effort resulted in reducing the total number of taxa on the parks species checklist for which a voucher had not been located to 103.

4.5 Searching Regional Herbaria for Vascular Plant Specimens collected within Sequoia and Kings Canyon National Parks

Another objective of this project was to locate and document vascular plant specimens collected within Sequoia and Kings Canyon National Parks but residing within regional herbaria. This supports the main goal of documenting vascular plant vouchers collected within Sequoia and Kings Canyon National Parks.

Collection data from specimens collected within Sequoia and Kings Canyon National Parks was gathered via database file requests, web-based queries, and/or site visits. Keeping in mind historic boundary changes, we requested database files from staff at four regional herbaria and visited three herbaria known to have collections from the parks. The following describes the methods and outcomes of these events.

Database file requests

Specimen records were requested from several herbaria able to provide information on a portion or all of their holdings digitally (Appendix I). Staff from the University and Jepson Herbaria, the Carl W. Sharsmith Herbarium, Rancho Santa Ana Botanic Garden and the University of California Davis Herbarium provided databases filled with voucher information. Holdings from Fresno State College Herbarium were also examined which had been compiled into a database resulting from a thesis project examining the flora of the Kings Rivers drainage (York 1999). Databases examined were a subset of each herbarium's substantial holdings.

University and Jepson Herbaria, University of California at Berkeley (UCJEPS)

Recognizing that a significant number of collections from Sequoia and Kings Canyon National Parks are known to reside within the University and Jepson Herbaria, vascular plant voucher information was requested from the University of California at Berkeley. Dr. Richard Moe, of the University and Jepson Herbaria provided two delimited files in response to these requests (Appendix A.4). The first data request targeted all records collected in Fresno and Tulare counties (14,488 records), while the second request sought records lacking information in the county field but which contained specific place name information tying the collection to Sequoia or Kings Canyon National Parks (1,109 records). The resulting records were imported into a database and plants potentially collected in the parks were identified by evaluating the specific collection location information. Through this process, 3,453 records were identified from Sequoia National Park, 1,283 from Kings Canyon National Park, 6 along the boundary between the two parks, 10,375 collected outside of the parks and 480 whose location could not be determined.

Carl W. Sharsmith Herbarium at San Jose State University (SJSU)

A preliminary search of the on-line holdings revealed a number of voucher specimens Dr. Sharsmith had collected in Sequoia and Kings Canyon National Parks. Collections manager, Toni Corelli (Appendix A.5) was contacted and provided a list of all specimen records in Fresno and Tulare counties (413 records). All holdings of the herbarium are databased. Records not assigned a county are either collections from out of the country or in another state (pers. comm. T. Corelli, December 9, 2004). The list was imported into a database and specimens collected in the parks were identified by evaluating collection location information. Through this process, 94 records were identified from Sequoia National Park, 156 from Kings Canyon National Park, 161 collected outside of the parks and 2 whose location could not be determined.

Rancho Santa Ana Botanic Garden (RSA)

The Garden's Herbarium database includes collections from several plant families as well as all taxa recognized as sensitive, threatened or endangered and of limited distribution by the California Native Plant Society. Staff member Naomi Fraga (Appendix A.6), provided a file listing known collections from Fresno and Tulare counties (540 records). This file was imported into a database and collection

location information for each record was evaluated to identify which were collected in the parks. Through this process, 114 records were identified from Sequoia National Park, 31 from Kings Canyon National Park, 1 from along the boundary between the two parks, 378 collected outside of the parks and 16 whose location could not be determined.

University of California Davis Herbarium (DAV)

A preliminary search of the University of California Davis Herbarium on-line holdings revealed a number of voucher specimens collected in Sequoia and Kings Canyon National Parks. Computer resources specialist, Tom Starbuck (Appendix A.7) was contacted and provided a list of all specimen records in Fresno and Tulare counties (360 records) as well as records lacking information in the county (2,410 records). Note that mostly specimens from the past nine years are only available electronically with the exception of some backlogged specimens of Beecher Crampton processed around five years ago (pers. comm. T. Starbuck, February 4, 2005). The list was imported into a database and specimens collected in the parks were identified by evaluating collection location information. Through this process, 56 records were identified from Sequoia National Park, 25 from Kings Canyon National Park, 2,669 collected outside of the parks and 20 whose location could not be determined.

Fresno State College Herbarium at California State University, Fresno (FSC)

A database containing specimen records from the Fresno State College Herbarium was examined to identify records collected in the parks (Appendix J). This database (Kings River Flora.mdb) was delivered to the parks as part of a master's thesis documenting the flora of the Kings River basin (York 1999). Specimen records collected in the parks reportedly held at FSC Herbarium were identified by evaluating collection location information. Through this process, 1 record was identified from Sequoia National Park, 158 from Kings Canyon National Park, 1 from along the boundary between the two parks, 3,691 collected outside of the parks and 1 whose location could not be determined.

Several lists were generated from each herbarium's database. These lists are as follows: 1) taxa included on the parks checklist but lacking a known voucher specimen, 2) taxa collected in the parks but not yet included on the parks species checklist and 3) specimens that would provide additional evidence data for taxa already on the checklist and documented by at least one known voucher. These lists provided guidance to efficiently search for specimens while visiting regional herbaria.

Web-based Queries

Taxa on the parks species checklist for which a voucher had not been located by earlier methods (103 taxa) were also searched for using web-based databases at the University and Jepson Herbaria, the University of California Davis Herbarium and Chico State University Herbarium. Searching these on-line holdings did not produce any additional information to document an undocumented taxon. Note, however, that the UC Davis Herbarium on-line database only provides information for specimens accessioned in the past five years and Chico State University Herbarium only provides information for three-fourths of their holdings.

Site Visits

To most efficiently locate taxa collected from within Sequoia and Kings Canyon National Parks, we prioritized tasks while visiting regional herbaria. These tasks assigned in order of importance are as follows: 1) manually search the herbarium's collections for taxa included on the parks checklist but lacking a known voucher specimen and verify those vouchers, 2) search the herbarium's collections for taxa collected in the parks but not yet included on the parks species checklist generated from the regional herbaria databases delivered to this project and 3) if time allowed, search for specimens that would provide additional evidence data for taxa already on the checklist and documented by at least one known voucher from herbaria that do not have their entire holdings available digitally.

Three regional herbaria were visited and their collections hand searched for vouchers collected within the parks listed on the parks checklist for which a specimen had not been documented (103 taxa). These efforts resulted in documentation of a total of 33 taxa: 23 at California Academy of Sciences, two at the University and Jepson Herbaria and eight at Rancho Santa Ana Botanic Garden.

In addition to searching general collections at regional herbaria, many research herbaria also have a type collection housed separately from the general collection. Type or synoptic collections consist of single vouchers representing each taxon on the state's flora. Rancho Santa Ana Botanic Garden's synoptic collection was searched for undocumented taxa reported on the checklist that had a high probability of being housed at the herbarium, specifically those collected by John Thomas Howell and Philip Munz. No specimens from Sequoia and Kings Canyon National Parks were located in the synoptic collection at RSA. The University and Jepson Herbaria's type collection was not searched as all undocumented taxa were previously searched for using their on-line database. Taxa reported on the checklist with a high probability of residing in the California Academy of Sciences type collection, e.g. collections made by John Thomas Howell, were not searched for due to time constraints.

Additional National Park Service efforts to document voucher information

In addition to park based efforts to gather voucher information from outside herbaria, the NPS Inventory and Monitoring Program in Ft. Collins also acquire specimen data from museums and herbaria throughout the country on behalf of all parks (Appendix K). A file listing their most recent data mining efforts was obtained and converted into a database. This file lists which museums and herbaria have been contacted and the results of these inquiries. Thus, further efforts to contact these herbaria for this project are not necessary at this time.

4.6 Adding Taxa to and Removing Taxa from the Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist

This project placed the parks vascular plant species checklist under a high degree of scrutiny by searching specimen collections and evaluating specimen records from herbaria to document the flora as well as examine reasons why undocumented taxa were listed on the checklist. These processes resulted in the addition and removal of several taxa from the checklist.

A total of 67 taxa were added to the checklist (Appendix L). Taxa collected within Sequoia and Kings Canyon National Parks new to the parks species checklist were noted while evaluating specimen records and collections in either the SEKI Herbarium or in regional herbaria. These taxa were located and verified against comparison collections at regional herbaria before being added to the parks checklist. Two of these 67 taxa were locally collected and were either verified at the University and Jepson Herbaria or verified by a subject matter expert.

Ten taxa were removed from the checklist (Appendix M). These taxa were marked in the parks vascular plant species checklist database so they would not appear when a species list is generated for Sequoia and Kings Canyon National Parks. Reasons for removing these ten taxa were as follows: 1) the name was not recognized by Hickman (1993) or the Jepson Online Interchange for California Floristics, nomenclature followed that of Munz (1959, 1968), 2) the name became an incomplete name after the addition of new subspecies to the checklist, 3) vouchers for taxa tying the name to the checklist were located which proved to be misidentified or translated incorrectly from Munz to Jepson nomenclature, 4) retention of an incomplete name on the checklist and 5) vouchers for taxa reported as residing in the SEKI Herbarium collected in the parks tying the name to the checklist were located, but upon inspection were not collected in the parks.

4.7 Verifying Species Identifications on the Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist

Optimally, when documenting a flora, each voucher specimen is examined and its identification verified. It is important to note that as time was limited, we did not examine all holdings in regional herbaria or in the Sequoia and Kings Canyon National Parks Herbarium. Although many of the collections documented in this report were located and examined in hand, we collected most vascular plant voucher information from digital records provided by regional herbaria.

From the outset, we accepted that all holdings in the SEKI Herbarium were verified prior to 1984 by NPS botanist, Larry Norris, to the current nomenclature of the time which was that of Munz (1959, 1968). In 1994, collections in the SEKI Herbarium were electronically updated to the current nomenclature of Hickman (1993) by a file provided by NPS research staff (Section 3.1). All additions to the vascular plant checklist since 1984 have been verified by either a subject matter expert or through comparison with holdings at an outside herbaria.

Concerning taxa only represented in regional herbaria, we elected to manually verify the identification of at least one voucher representing that taxon. Through searching specimen records provided by herbarium databases and hand searching herbarium collections we documented 108 taxa at regional herbaria. Of those 108 taxa, a voucher was located and verified for 101 of them. The remaining seven taxa were not located because the voucher was either out on loan or the herbarium where the specimen resides was not visited during this project. Taxa only residing at regional herbaria that were not verified during this project are identified in the parks vascular plant species database, SEKI Flora.mdb.

SECTION 5 – METHODS AND PRODUCTS FOR FINAL DELIVERABLES

The main focus of this project was to gather vascular plant species evidence data collected within Sequoia and Kings Canyon National Parks from individual voucher specimens, references, or highly qualified observers. The data collected has been compiled in a database with the necessary information to sufficiently document plant vouchers in NPSpecies. NPSpecies is the National Park Service Inventory and Monitoring program's standardized on-line relational database which provides lists of species that occur in NPS units (Section 7). NPSpecies provides a means to store, manage and disseminate scientific information on the biodiversity of organisms in National Park Service units throughout the United States and its territories.

5.1 Vascular Plant Species Checklist and Records of Voucher Specimens for Sequoia and Kings Canyon National Parks (for submission to NPSpecies)

The NPSpecies database is designed to derive a park's species checklist from specimen records provided by each park unit. Alternatively, a separate checklist can be created and submitted by each park (pers. comm. S. Kingston, January 26, 2004). As the NPSpecies checklist database requires additional information be provided for each taxon, including status in the park, abundance (Appendix N) and nativity, it is advantageous to provide a separate park species checklist with each species attributed with these data. For this reason, we elected to provide the Inventory and Monitoring Program two separate database tables (one containing the checklist and the other documenting all known voucher collections of each taxon) with all fields compatible with NPSpecies file structure.

A database documenting collections of vascular plants of Sequoia and Kings Canyon National Parks was constructed using Microsoft Access 2002. Two separate database tables were created that contain data to be delivered to NPSpecies. One table provides the parks species checklist and the second provides vascular plant voucher information or evidence data. Each database table has been submitted to the

Inventory and Monitoring Point of Contact for submission to NPSpecies. The Point of Contact will subsequently certify the data before submitting to NPSpecies staff for upload to the national database (Appendix O).

Vascular Plant Species Checklist

A database table was constructed that mirrored NPSpecies data structures for the NPSpecies parks species checklist database (Appendix P). The table was based upon specimen records collected from select western herbaria, the parks local vascular plant checklist and local knowledge of taxa in the parks but not yet listed on the parks vascular plant checklist (5 taxa, Athena Demetry, Appendix A.3). This table, named Vascular Plant Checklist, contains 1,550 taxa in 109 families. At this time, 1,490 taxa on the parks vascular plant species checklist are documented by voucher specimens collected within the parks. The remaining 60 non-vouchered taxa were reported to NPSpecies with a very high confidence that the taxon is currently in the park (Appendix Q).

As the checklist submitted to NPSpecies contains names for all specimen records in the voucher database table, steps were taken to ensure the parks species checklist was not artificially inflated by 1) including incomplete identified taxa (e.g. Lotus species, Fabaceae), 2) including *sensu latu* taxa in which a subspecific taxon(a) was also present on the parks species checklist and 3) including extirpated alien taxa. This was accomplished by assigning the Park Status of these taxa as either not applicable or historic. Two exceptions were made for retaining *sensu latu* taxa on the parks checklist: *Ribes menziesii* Pursh and *Cirsium arizonicum* (A. Gray) Petr. (Appendix R).

Voucher Records

The Vascular Plant Vouchers table also mirrors the structure of the NPSpecies voucher database (Appendix S). The table was based upon specimen records collected from the local parks herbarium and select regional herbaria in California known to contain collections from Sequoia and Kings Canyon National Parks.

This table contains information for 11,199 vascular plant vouchers collected within Sequoia and Kings Canyon National Parks: 7,409 specimen records from Sequoia National Park, 3,735 from Kings Canyon National Park, and 55 from Sequoia and Kings Canyon National Parks (specimens collected along the boundary between the two parks). Nearly half of these vouchers (5,506 or 49%) reside in the local Sequoia and Kings Canyon National Parks Herbarium. The remaining 5,693 vouchers reside in regional herbaria, including the California Academy of Sciences (182) in San Francisco, the Carl W. Sharsmith Herbarium (250) located at San Jose State University, the Duke University Herbarium (83, specimens on loan from SEKI Herbarium) in Durham, NC, Fresno State College Herbarium (159) in Fresno, Rancho Santa Ana Botanic Garden (178) in Claremont, the University and Jepson Herbaria (4,757) located at the University of California in Berkeley, and the University of California Davis Herbarium (84) in Davis.

In addition, two specimen records not collected in Sequoia and Kings Canyon National Parks but from the Sierra Nevada networked parks were included in this table: one from Devils Postpile National Monument and one from Yosemite National Park. These vouchers were noted and recorded while documenting the flora of Sequoia and Kings Canyon National Parks.

5.2 Updated local Vascular Plant Species Checklist and Herbarium holdings (for local use)

A database that contains information regarding the parks vascular plant species checklist, vascular plant voucher collection information contained in the local park herbarium and a means to accession newly collected voucher information into the park herbarium was provided. The database was created in Microsoft Access 2002. This database, named SEKI Flora.mdb, replaces the previous database used to document the SEKI Vascular Plant Checklist (Jflora.mdb).

Updated local Vascular Plant Species Checklist

All taxa listed on the parks species checklist were updated with currently accepted nomenclature from the Jepson Online Interchange for California Floristics. In addition, the checklist was updated with the USDA PLANTS code and the Integrated Taxonomic Information System's Taxonomic Serial Number to facilitate comparison with other regional herbaria.

The Sequoia and Kings Canyon National Parks vascular plant species checklist contains 1,545 taxa in 108 families; 188 of these, or 12%, are non-native (Appendix T). Voucher specimens for 1,382 taxa (or 89% of the total flora) are housed in the park herbarium. Another 108 taxa are represented by vouchers residing in regional herbaria, bringing total number of vouchered taxa to 1,490 (or 96% of the total reported flora).

Local Park Herbarium holdings

In addition, a database table listing all the SEKI Herbarium's vascular plant holdings was provided for park staff to easily access collections within the herbarium. The data for this table was exported from the SEKI Herbarium's museum collections database, ANCS+, and converted to a database table.

A database table was also created to accession newly collected vascular plant specimens into the SEKI Herbarium. Data from this table can be submitted to the museum staff for upload to the herbarium's museum collection database, ANCS+. The data can also be appended to the SEKI Herbarium vascular plant holdings table mentioned above for park staff to easily access vascular plant voucher information contained in the local park herbarium.

SECTION 6 – RECOMMENDATIONS FOR FUTURE EFFORTS

The following is a list of recommendations to continue the work begun by this project.

1. Continue efforts to document the Sequoia and Kings Canyon National Parks vascular plant species checklist, by seeking vouchers for the 60 taxa included on the list for which a voucher has not been located (Appendix Q).

This involves either collecting the taxa locally and accessioning specimen into the local SEKI Herbarium or performing site visits to outside herbaria that were not visited during this project and which do not provide their entire holdings electronically. This list of undocumented taxa should provide the initial search list for visits to key herbaria lacking a digital record of their holdings (Santa Barbara Botanic Garden, University of California Davis Herbarium, Humboldt State University Herbarium and Fresno State College Herbarium). The type specimens housed separately from the general collection at California Academy of Science should also be searched.

2. Verify new taxa (73) to the parks vascular plant species checklist housed within regional herbaria (Appendix U). Taxa collected within Sequoia and Kings Canyon National Parks new to the parks checklist were noted while evaluating specimen records provided by regional herbaria. We were unable to verify all potentially new taxa due to time constraints. These specimens will need to be located, identified and verified by comparison with holdings at regional herbaria.

3. Collect vascular plant voucher information from regional herbaria via database file requests or site visits. This would result in finding more evidence records for taxa already included on the checklist. This includes but is not limited to University of California Davis Herbarium, California Academy of Sciences, University of California and Jepson Herbaria, Fresno State College Herbarium, Santa Barbara Botanic Garden, and Rancho Santa Ana Botanic Garden.

The SEKI Herbarium's archives contain several paper copy lists of vascular plant specimen collected in Sequoia and Kings Canyon National Parks from the 1940s (collector Frank Oberhansley and collectors John Thomas Howell and Dr. Munz), 1950s (collectors Peter Raven and Michael McDonald) and 1960s (collector Donald Myrick) with mention that these collections were deposited in the following herbaria: California Academy of Sciences, Santa Barbara Botanic Garden and Rancho Santa Ana Botanic Garden.

The following is a list of steps to finish searching the SEKI Herbarium for voucher information. Performing these tasks will not result documenting taxa on the parks species checklist, but will provide additional voucher information for already documented species.

4. Approximately 445 vouchers were listed as deaccessioned in the SEKI museum collections database, ANCS+. Twenty five vouchers from the group of deaccessioned vouchers not marked as having been sent to outside herbaria (total 320 vouchers) were randomly chosen and searched for in the SEKI Herbarium (Appendix B). Three vouchers were found. Searching for all 320 deaccessioned vouchers may result in locating additional holdings of taxa already included on the checklist.

5. Several uncataloged plants were discovered in the SEKI Herbarium. These plants were filed in the herbarium and each specimen was hand annotated with the word "uncataloged" at the bottom of the herbarium sheet. Assuming that additional uncataloged specimens reside within the herbarium, the curatorial staff and users of the collections should be advised of this, and note made of such collections when they are encountered.

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SECTION 8 – APPENDICES

Appendix A – Contact Information

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Appendix B - Deaccessioned vascular plant vouchers in the Sequoia and Kings Canyon National Parks Museum Collections database, ANCS+

Approximately 445 vascular plant vouchers have a status of deaccessioned in the SEKI museum collections database, ANCS+. Deaccessioning a specimen is the process of permanently removing NPS museum collections from an NPS unit's ownership and custody. Through searching the herbarium, a voucher marked as deaccessioned was found. As this inconsistency was noted, it became important to understand what happened to these "deaccessioned" vouchers and discover why they were removed from the collections. After locating the initial "deaccessioned" voucher, 25 from the vouchers marked in the database as deaccessioned were randomly chosen and searched for in the herbarium. Three additional vouchers were located.

In March of 2004, Ward Eldredge, SEKI museum staff member and Jennifer Akin examined accessioning records documenting these deaccessioned plants. Plants marked as deaccessioned were from Accession numbers 12 and 13. Accession 12 and 13 are comprised of collections by S. J. Pusateri (226 collections), H. E. Bailey (14 collections), Frost (16 collections), Booth (4 collections) and unknown collectors (186 collections).

The following is a list of findings concerning these deaccessioned vouchers from the accession records stored in the SEKI Herbarium.

1. Accession 12 including catalog numbers 117-1004 were assigned in the late 1950s by Fern Gray, a local historian who worked with the parks collections.
2. Accession 12, catalog numbers 117-1004 were reassigned to Accession 373 under one catalog number, 3600 by Jack Rockwell, a Ranger and botanist on February 27, 1971. In addition, Rockwell disposed of 241 items from Accession 12 and marked a large 'X' on the catalog cards for each disposed specimen. As no further records exist, the manner of disposal is not known.
3. Accession 12, catalog numbers 117-1004 were reactivated by Betty Knight, Foothills District Interpreter, on November 14, 1984. Rockwell's reassignment of Accession 12 was reversed to the original accession number and original catalog numbers. In addition, Knight wrote "deaccessioned" on the catalog cards for the 241 collections that were disposed of by Rockwell.
4. Forty one vouchers from Accession 12 were transferred to Rancho Santa Anna Botanical Garden on November 16, 1984 and 85 vouchers were transferred to California Academy of Sciences on November 19, 1984 as they were excess to the needs of the SEKI Herbarium. In March of 2004, Ward Eldredge contacted both herbaria and discovered that a manual search is the only way to know if the vouchers still reside within those collections. Two specimens were encountered while searching the collections at California Academy of Sciences. These transferred vouchers were not specifically searched for at either California Academy of Sciences or Rancho Santa Ana Botanic Garden.
5. All vouchers in Accession 12 and 13 were manually examined and inventoried by Sequoia District Interpreter Ellen Seeley in 1993. The item counts were updated and the storage location edited. It can only be assumed that at this time or after the vouchers in Accession 12 and 13 not found by Seeley were marked with a status of deaccessioned in the museum collections database.

Appendix C - Sequoia and Kings Canyon National Parks Museum Collections database, ANCS+

ANCS+ software was installed locally and passwords to access Sequoia and Kings Canyon Herbarium natural history collections were obtained from SEKI museum staff member, Ward Eldredge. A general use and a special permissions login and password were obtained. The special permissions login and password provided access to the 'Import/Export selected fields' function from ANCS+. This function was necessary in order to export the SEKI Herbarium natural history collections.

All SEKI Herbarium natural history collections were exported from the SEKI museum collections database, ANCS+, and imported into a database. Plant voucher records were identified and exported into a vascular plant voucher table within the database (resulted in 6,432 records).

Collection location information for each voucher record was individually examined and each record was assigned the corresponding park acronym in relation to the collection location, if applicable. Assigned park collection locations are as follows: SEQU (Sequoia National Park; 3,459 records), KICA (Kings Canyon National Park; 1,893 records), SEKI (Sequoia or Kings Canyon National Parks; 46 records; typically the specimen was collected along the boundary between the two parks or the specific park collection location could not be determined solely on information provided in the database), No Det. (collection location could not be determined; 12 records), OUT (specimen not collected in the parks; 576 records), or DEAC (specimen reported as deaccessioned in the museum collections database; 446 records). Also, if a collection location fell on the border between the parks and private, Bureau of Land Management, or Forest Service lands (i.e. typically a mountain pass) the collection location was assigned to the respective park as long as the specimen did not add a new taxon to the SEKI vascular plant species checklist. Voucher specimens in which the collection location information in the database did not provide sufficient collection location information to assign a park collection location were manually examined in the SEKI Herbarium (71 vouchers). Vouchers subsequently assigned the No Det. designation were included in this search.

The following lists the media sources, methods and database fields used to assign each voucher the appropriate park collection location.

1. Media and materials used to aid in locating collection locations were as follows: USGS 7.5 and 15 minute series topographic maps, Topozone.com (Section 7), Place Names of the Sierra Nevada (Browning 1986) and local knowledge from SEKI Staff (Ward Eldredge, Sylvia Haultain and Dr. William Tweed; Appendix A.3).

2. Various database fields and methods were evaluated to verify a specimens' collection location. These were elevation data, collection location data fields (keeping in mind historic boundary changes) and recreating a collector's route if the collection location was questionable. The latter was performed by querying records by collector followed by sorting the collector by collection date revealing the route traveled by the collector. This method often significantly aided in assigning appropriate collection locations.

Several data fields in the SEKI museum collections database, ANCS+, required reformatting or data population before including the data in the vascular plant voucher database provided to NPSpecies. The following is a list of fields in ANCS+ that were modified.

1. Elevation: ANCS+ houses elevation data in one field. Elevation data was split into two fields: numeric elevation and elevation units. Units (feet or meters) were assigned to voucher records with numeric elevation data but which lacked units.

2. UTM: the ANCS+ UTM coordinate data field contained many different formats. In order to rectify shortcomings of the vascular plant voucher data housed in the SEKI museum database, ANCS+, that limited the databases' usefulness to park managers and researchers (National Park Service 1999) the following changes were made by Brent Johnson in 1999. One result was to convert the UTM coordinate data to one consistent format and assign UTM coordinates to many records that lacked coordinate information. The consistent UTM format from this effort was incorporated in the vascular plant voucher database but only for records in which the UTM coordinate data were originally present in ANCS+ (the derived UTM coordinate data from the 1999 project were not included as this information would not be listed on the specimen's voucher label).

While examining the SEKI museum collections database, several voucher records were recognized that required manual examination before being included in the voucher database provided to NPSpecies.

Measures were taken to locate and manually examine these vouchers. Nine vouchers were set aside as the specimen's identification required verification and in-house verification was not successful (typically these species were new to the parks checklist). At SEKI, new taxa are added to the parks species checklist only if a specimens' identification is verified at an outside herbarium or by a subject matter expert. Thirty five vouchers were verified by park botanist, Cheryl Bartlett (Appendix A.3) and annotated with subspecies when appropriate.

Appendix D – Accessioning Vascular Plant Collections into the Sequoia and Kings Canyon National Parks Herbarium

Every investigator seeking to collect vascular plant specimens in Sequoia and Kings Canyon National Parks is required to provide vouchers to the SEKI Herbarium as a condition of receiving a research permit. Each project must also provide collection information in a format that can be imported in the currently accepted collections management software, ANCS+.

Vascular plant voucher collections were last accessioned in the SEKI Herbarium in 1999. Over the past five years, over a thousand vascular plant vouchers have been produced through the culmination of various plant observation projects. In 1999, dBase was the database software program in use by SEKI staff and thus tables in this format were used to accession plants in the SEKI Herbarium. Since that time, the National Park Service has accepted Microsoft Access as its primary database software. This project addressed the need to construct an Access database for SEKI staff to accession vascular plant vouchers.

The database to accession vascular plant vouchers was constructed using Microsoft Access 2002 (SEKI Flora.mdb). The tables contained within the database were designed to be compatible with the SEKI museum collections database, ANCS+. Data fields required by ANCS+ were identified using the Automated National Catalog System User Manual (1998), section 6 pps. 19 – 24. An electronic User Manual for ANCS+ is also available for download from their website.

The accessioning database table provides an intermediate link for uploading new voucher information into the SEKI museum collections database, ANCS+. This database table is intended to be filled with plant voucher data from SEKI projects that are ready to be accessioned in the SEKI Herbarium. Guidelines were established as follows: after filling the database with voucher data, the database is submitted to SEKI museum staff who then upload the data to the SEKI museum collections database. After the museum collections database has been successfully updated, the voucher specimens are filed in the herbarium.

The majority of backlogged vouchers included in this database were generated by the following plant observation projects: SEKI Vegetation Mapping, SEKI Special Status Plants Surveys, USGS Fire and Fire Surrogate Study, Kings River Flora project (York 1999), and the SEKI Natural Resource Inventory. Each of these projects already had a database filled with voucher information and these data were imported into the accessioning database table. Voucher records were updated with required ANCS+ data and/or reformatted to meet ANCS+ formatting criteria.

The following is a list of methods applied to all voucher records and specific details associated with certain project datasets from the plant observation projects mentioned above.

1. Each voucher record's collection location was examined and the respective parks collection location was assigned, if applicable. Designations assigned were: SEQU (collected in Sequoia National Park), KICA (collected in Kings Canyon National Park), or OUT (not collected in the parks).
2. Voucher data from the Kings River Flora project (York 1999), which was delivered to the park with geographic location as longitude and latitude were converted to UTM coordinates. Dana York was contacted and he provided the Datum and format of the latitude and longitude coordinates reported in his

thesis work (Appendix A.8). The conversion was performed using the software, Corpscon (section 7). Corpscon is a MS-Windows-based program which allows the user to convert coordinates between Geographic, State Plane and Universal Transverse Mercator (UTM) systems on the North American Datum of 1927 (NAD 27), the North American Datum of 1983 (NAD 83) and High Accuracy Reference Networks (HARNs). Corpscon version 5.11.08 was installed on a local computer and UTM coordinate data from the Corpscon output file were imported into the database Dana had provided (Kings River Flora.mdb) and then linked to the appropriate plant voucher records.

3. Each record with UTM coordinate data was plotted using ArcView GIS 3.3 to detect errors in locational data. One record collected in Kings Canyon National Park when plotted fell outside the park boundary. This voucher came from the Kings River Flora project (*Antennaria dimorpha*, York collection number 0640). The specimen was located and the latitude/longitude coordinates recorded on the herbarium label were examined and found to be identical to the coordinates reported in the database. When these latitude/longitude coordinates were plotted, the location also fell far outside the park boundary. The voucher was annotated with corrected and derived latitude/longitude and UTM coordinates corresponding to the collection location description.

4. Fields listed in the SEKI museum collections database, ANCS+ (TSN, USDA PLANTS code and Jcode) were filled with the corresponding data for all voucher records included in the database. This was done by linking the database to the parks vascular plant species checklist database (SEKI Flora.mdb) and using an update query.

Forty four records were not updated with a Jcode as the taxa were not previously listed on the parks species checklist. To assign a Jcode, these vouchers required identification to the subspecies level. The vouchers were located and identifications verified by park botanist, Cheryl Bartlett. Vouchers were identified to the subspecies level where possible, annotated accordingly and included in the accessioning database table.

5. A number of cataloged vouchers that were not listed in the SEKI museum collections database, ANCS+, were discovered in the SEKI Herbarium. The catalog numbers from these vouchers were tracked using the SEKI Herbarium accession book and were discovered to be from a batch set of catalog numbers assigned to Natural Resource Inventory (NRI) vascular plant vouchers collected in 1993. Searching ANCS+ revealed the batch set assigned to the NRI vouchers were not present in the museum collections database. Sylvia Haultain provided the original database that housed the voucher data which was intended to be uploaded in ANCS+. This dataset was included in the accessioning database.

A total of 1,295 vascular plant vouchers were included in the accessioning database: 505 SEKI Vegetation Mapping vouchers, 50 SEKI Special Status Plants Survey vouchers, 44 USGS Fire and Fire Surrogate Study vouchers, 335 Kings River Flora project vouchers, 286 SEKI Natural Resource Inventory vouchers, 10 SEKI Alien Species Project vouchers and 65 various botanist collections. All vouchers were collected in Sequoia and Kings Canyon National Parks except one. This voucher was collected in Yosemite National Park by the SEKI Special Status Plants Survey (*Trifolium bolanderi* A. Gray; SEKI 19802). The voucher was accessioned and deposited in the SEKI Herbarium.

Appendix E – California Flora Database

A delimited file containing a list of all plant names accepted in the revised Jepson on-line manual was obtained from the University and Jepson Herbaria at the University of California in Berkeley. Plants in this file can be searched for individually using the Jepson Online Interchange for California Floristics (Section 7). The Jepson Online Interchange for California Floristics is a snapshot of current taxonomic thinking and reflects what will be published in the second edition of *The Jepson Manual*. Data requested included the following; USDA PLANTS code, family, genus, species, species authority, rank, subspecies, subspecies authority, full trinomial with authority, nativity status and common name(s). The file was

opened in Microsoft Excel 2002 and converted into a database table named “California Flora” using Microsoft Access 2002. Authority names that contained a special accent character did not convert correctly. These plants were searched for using the Jepson Online Interchange and the authority was copied from the Interchange website and pasted into the database table. A comment file describing methods for this file conversion was created documenting the original import. Note that this information will change as progress towards the second edition of *The Jepson Manual* proceeds, including changes in family affiliations (pers. comm. R. Moe, February 9, 2004).

Twenty eight taxa listed on the parks species checklist were added to the California Flora table. Each taxon added to the California Flora table was cross referenced using the Jepson Online Interchange for California Floristics, *The Jepson Manual* (Hickman 1993), USDA PLANTS website and the Integrated Taxonomic Information System website to discover reasons these plants were not including in the file provided by the University and Jepson Herbaria. These taxa were typically hybrid species, ornamental species, taxonomic or nomenclatural synonyms for taxa native to CA (treated +/- as minor variant by the Jepson Herbarium), or had an unresolved status listed by the Jepson Herbarium (also treated as minor variant by the Jepson Herbarium).

Of note, a delimited file can be retrieved from the University and Jepson Herbaria website that contains a list of names included in the 1993 edition of *The Jepson Manual*. This is a comma delimited file and only lists the plant trinomial data and associated family. This file was not used to update the nomenclature fields in the parks species checklist database because the 1993 edition of *The Jepson Manual* is outdated concerning current and accepted taxonomic thinking. Mention of this file is included only to clarify the resources available on the University and Jepson Herbaria website and explain why this file was not used to update nomenclature.

Appendix F – Updating the Parks Vascular Plant Checklist with current nomenclature

The park vascular plant checklist database (Jflora.mdb) served as the master checklist of vascular plants known to occur in Sequoia or Kings Canyon National Parks. Jflora was used by SEKI staff to print herbarium labels for voucher specimens and to populate databases with plant observation data. We elected to create a new database for use by SEKI staff, named SEKI Flora.mdb, which stores the parks vascular plant species checklist information, specimen collections information housed within the SEKI Herbarium and a new table to accession specimen collections into the SEKI Herbarium. As the new checklist database contains many more functions than the preexisting checklist database, Jflora, we decided to move away from Jflora and store it for historical purposes. Thus, the new master checklist in SEKI Flora (based upon Jflora checklist information) was updated to reflect current nomenclature, accurate spelling and consistent naming conventions.

The database table California Flora (Appendix E) was used to update the nomenclature in the parks species checklist. The California flora table was derived from a file provided by the University and Jepson Herbaria and contains a list of all accepted California taxa. The update filled a new field named “Trinomial” with the current accepted nomenclature for each taxon. The parks species checklist database and the California Flora table were linked using the full plant trinomial fields and the new Trinomial field was updated through the use of an update query. This effort revealed 667 records with spelling differences in the California Flora table from that of the original trinomial field (Jtrinomial) from the previous parks species checklist database (Jflora.mdb). The majority of differences were due to punctuation, abbreviation, or lengthening of the authority name. Each of these records were examined individually, and the new Trinomial field was populated by using a pull down list from the California Flora table. Comments were noted in a separate field that was included to capture reasons the plant trinomial changed in any fashion from the original trinomial listed in the Jflora database. The original trinomial field (Jtrinomial) was retained in the database for historical purposes and data in the component

fields associated with the plant trinomial (genus, species, species authority, rank, subspecies and subspecies authority) were replaced with the corresponding fields from the California Flora table.

Appendix G – Assigning USDA PLANTS code to the Parks Vascular Plant Checklist

The parks vascular plant checklist database (SEKI Flora.mdb) was updated to include the USDA PLANTS code for each taxon, which facilitates comparison with other regional databases. The USDA PLANTS code is a unique letter and number code derived from the first two letters of the genus, first two letters of the species, first letter of the subspecies (if applicable), and a number (if applicable) appended to distinguish from identical letter codes.

The USDA PLANTS code was derived from a file provided by the University and Jepson Herbaria (Appendix E). This file was changed into a database table named, California Flora and contains a list of all names accepted by the revised Jepson Manual. The California Flora table and the parks species checklist database were linked and each taxon on the parks species checklist was assigned the appropriate USDA PLANTS code.

The following describes the USDA PLANTS database. Much text was taken from their website (Section 7). The USDA PLANTS Database provides standardized information about the vascular plants, mosses, liverworts, hornworts, and lichens of the U.S. and its territories. It includes names, plant symbols, checklists, distributional data, species abstracts, characteristics, images, plant links, references, crop information and automated tools.

Appendix H - Assigning Taxonomic Serial Number to the Parks Vascular Plant Checklist

Assigning the appropriate Taxonomic Serial Number (TSN) to taxa listed on the parks species checklist (SEKI Flora.mdb) involved several intermediate steps. TSN is a unique number assigned to identify species in a national context. NPSpecies only recognizes TSN to uniquely identify taxa.

A customized download from the Integrated Taxonomic Information System (ITIS) website was requested and retrieved (Section 7). ITIS assigns and manages the TSN system. ITIS is the result of a partnership of federal agencies formed to satisfy mutual needs for scientifically credible taxonomic information. Taxa in the kingdom Plantae for all of North America were requested. The file was opened in Microsoft Excel 2002, converted to a text file and imported into a database table using Microsoft Access 2002.

The TSN for vascular plant species was then linked to the California Flora table provided by the University and Jepson Herbaria using an update query. The California Flora table contains a list of all accepted California plant names (Appendix E). Nearly all of the 8,000 records were updated with a corresponding TSN. Approximately 275 records were not updated. Reasons these records were not updated with a TSN were as follows: differences in the spelling of the plant trinomial, differences in the rank designation, or the plant was not yet listed by ITIS. Of these 275 records, 164 were listed on the SEKI vascular plant checklist and were evaluated by cross checking the plant name in the TSN download and then searching for the plant on the ITIS website to determine the correct TSN. A permanent TSN was assigned to 130 of these taxa; the remaining 34 were assigned a placeholder, or TSN of -99*. Negative TSN are assigned to taxa awaiting assignment of permanent TSN by ITIS staff. An earlier table listing the California taxa provided for the Yosemite species documentation project (National Park Service 2003b) was also imported and linked to the California Flora table to gather additional missing TSNs for the remaining 111 records. Plants with a TSN in the file provided for the Yosemite species documentation project were cross checked using the ITIS website before updating the TSN field in the California Flora

table. A comments field was incorporated to capture any notes, discussion, updates, etc. for taxa in the California Flora table.

Note that there is only one data field that can be used to link the ITIS TSN table to the California Flora table. This field houses the plant trinomial without authority. A find duplicates query was performed on this field in the ITIS TSN table and resulted in many duplicates. This duplicates query was linked to the parks species checklist database and revealed all taxa listed on the parks species checklist that appeared as duplicates in the ITIS TSN table. The following is an example demonstrating a taxon that has been assigned more than one TSN. *Chrysothamnus viscidiflorus* ssp. *viscidiflorus* had four different TSNs. One TSN corresponded to the subspecies level and the other three TSNs made additions to the subspecies level as follows; *Chrysothamnus viscidiflorus* ssp. *viscidiflorus* var. *stenophyllus* (Gray) Hall, *Chrysothamnus viscidiflorus* ssp. *viscidiflorus* var. *viscidiflorus* (Hook.) Nutt and *Chrysothamnus viscidiflorus* ssp. *viscidiflorus* var. *latifolius* (D.C. Eat.) Greene. The reason that ITIS lists subspecies followed by a variety taxon is not known. All taxa on the parks species checklist with duplicate TSNs were searched for on the ITIS website to see if the correct TSN had been assigned to the plant. Nearly all of the taxa were assigned the correct TSN, only two records were not and appropriate changes were made.

Lastly, the California Flora table and the parks species checklist database were linked and each taxon listed in the parks species checklist was assigned the appropriate TSN.

Appendix I - Acquiring electronic datasets from herbaria

The following describes the process used for requesting electronic datasets from herbaria. A list of data fields and a description of the strategy for limiting massive herbaria databases to return records with a high probability of collection in Sequoia and Kings Canyon National Parks is provided below.

For a file to be properly imported into an Access database, the file must be delimited (each data field needs to be distinguished from other data fields by a separator: comma, tab, etc.). The data fields requested for specimen records are listed in the table Vascular Plant Voucher Data Fields below (Table 1).

The following describes requesting subsets of data from large herbaria databases. Requesting subsets of data narrows searches and helps limit records to park collection locations.

1. Sequoia and Kings Canyon National Parks span two counties, Tulare and Fresno. Request a subset of voucher data from the herbarium collected in Tulare and Fresno counties. If the herbarium has the capability to further limit this request, then request specimens with elevation data by excluding elevations that do not occur in the parks: <1300 feet in Tulare county, <3500 feet in Fresno county.

2. If the herbarium has several tens of thousands of records without county information the following subset data request is recommended to return records with a high probability of collection in Sequoia and Kings Canyon National Parks (this was requested from University and Jepson Herbaria):

Request a subset of specimen records from the herbarium with no information in the county field but limit the request by searching for specific place names. Place names requested for SEKI were as follows: Sequoia, Kings Canyon, Giant Forest, Lodgepole, Mineral King, Cedar Grove, Grant Grove, Ash Mountain, Kaweah, Kaweah river, Kern, Kern river, Kings river, Hockett, Rae Lakes, LeConte, Tehipite, Evolution and High Sierra Trail.

Table 1 lists the data fields requested from all herbaria when requesting their collections information electronically. The data fields listed in Table 1 complete information sufficient to thoroughly document plant vouchers in the National Park Service standardized database, NPSpecies. Data fields marked with an asterisk are fields that can be derived from other sources. It is important to understand that not all fields

requested can be obtained from herbaria as voucher specimens will not have all information recorded and/or herbaria databases may not have the data available in an electronic format.

Table 1: Vascular Plant Voucher Data Fields

	Field Name	Type	Description
1	*TSN	Number	Integrated Taxonomic Information System (ITIS) Taxonomic Serial Number (TSN).
2	Species Latin Name with Authority	Text	Currently accepted scientific name of species including authority
3	Latin Name No Authority	Text	Currently accepted scientific name of species without authority
4	Name when observed, Doc Latin Name	Text	Documented scientific name of species in the original records when it was collected or observed, name of species at time of collection with authority, if available
5	Date	Date/Time	Date of collection
6	Time	Date/Time	Time of collection (24-hour clock, hh:mm)
7	Observer	Text	Name of collector
8	Observation ID	Text	Field collection number provided by collector, if available.
9	Habitat	Text	Description of habitat where collection was made
10	Elevation	Number	Estimated elevation in feet or meters where collection was made
11	Elevation Units	Text	Units for elevation (feet or meters)
12	Specimen ID	Text	Repository identification number of voucher specimen (frequently called 'catalog number')
13	*Specimen Location	Text	Acronym, name and address of herbarium, museum or other location of specimen
14	Location Description	Text	Concise description of collection site within the park or location from specimen label
15	Latitude	Number	Latitude in decimal degrees
16	Longitude	Number	Longitude in decimal degrees
17	UTM X	Number	UTM X coordinate (northing)
18	UTM Y	Number	UTM Y coordinate (easting)
19	UTM Zone	Number	UTM zone
20	UTM Datum	Text	DATUM for UTM coordinates (e.g., NAD27, NAD83)
21	Coordinate Location Error	Number	Estimated accuracy of the location in meters. How close are the coordinates to the true location?
22	Comments	Text	Comments
23	TRS	Text	Township, Range, Section
24	County	Text	County specimen was collected
25	Annotation	Text	Annotation information

Appendix J – Kings River Flora

As part of a thesis project, *A Phytogeographic Analysis of the Kings River Basin, California*, a database filled with vascular plant specimen records from the Kings River basin was compiled by Dana York (1999). The database contains information on vouchers residing in the Sequoia and Kings Canyon National Parks Herbarium (1,571 records), Fresno State College Herbarium (3,852 records), California Academy of Sciences (45 records), Carl W. Sharsmith Herbarium (3 records), and the University and Jepson Herbaria (9 records). The database also has many records of vouchers which came from published literature (3,146 records) but were not tied to a specific herbarium.

Collection location information for these records was evaluated and assigned a park collection location if applicable (excepting those records tied to the SEKI Herbarium which were evaluated in an earlier stage of this project [Appendix C]). This resulted in 3 records collected in Sequoia National Park, 483 records collected in Kings Canyon National Park, 1 record collected along the boundary between the two parks, 3,700 records not collected in the parks and 1 record in which collection location could not be determined due to insufficient information.

As this database only lists voucher information from the Kings River basin, a request was sent to the author (Appendix A.8) requesting information for Sequoia National Park vouchers residing at Fresno State College Herbarium. He reported that he went through all (more than 30,000) sheets at Fresno State College Herbarium and that at most there are one hundred plants housed in the herbarium from Sequoia National Park, none being of particular significance (pers. comm. D. York, November 19, 2003).

Since this database contains specimen information from several regional herbaria, several lists were created to aid in collecting specimen information from regional herbaria. These lists are as follows:

- 1) Lists of vouchers tied to an herbarium for taxa on the parks species checklist which need to be documented and lists of vouchers for taxa that would add new taxa to the parks checklist. These lists were generated from specimen records tied the following herbaria; Fresno State College Herbarium, California Academy of Sciences, Carl W. Sharsmith Herbarium and the University and Jepson Herbaria.
- 2) Lists were also created of specimen records from published literature, mainly from John Thomas Howell, whose collections are housed at California Academy of Science in San Francisco. These lists provided an efficient means to search for specimens at California Academy of Science which are as follows: search for taxa that would document a taxon presently not documented on the parks vascular plant checklist, search for taxa new to the parks checklist and search for taxa that would provide more evidence data (a voucher has already been documented for the taxon).

Appendix K - NPSpecies Data Mining

The national office of the NPS Inventory and Monitoring Program has requested digital records of voucher-specimens of vertebrate animal and vascular plant species records from a number of organizations; a list of their data mining efforts can be found on their website (Section 7). The Inventory and Monitoring Program will geo-reference these records to identify those that may fall within current NPS boundaries. Pertinent records will be converted to NPSpecies format and distributed to parks for further review. Applicable records will then be loaded into the master NPSpecies database.

Appendix L - List of Taxa added to the Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist, SEKI Flora.mdb

The following 67 taxa were added to the Sequoia and Kings Canyon National Parks vascular plant species checklist. All taxa were verified against comparison collection at regional herbaria or verified by a subject matter expert before being added to the parks checklist.

Table 2: Taxa added to the Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist

Family	Trinomial
Alismataceae	<i>Sagittaria cuneata</i> E. Sheldon
Amaranthaceae	<i>Amaranthus retroflexus</i> L.
Apiaceae	<i>Cymopterus terebinthinus</i> (Hook.) M.E. Jones var. <i>petraeus</i> (M.E. Jones) Goodrich
Apiaceae	<i>Eryngium spinosepalum</i> Mathias
Apiaceae	<i>Perideridia bolanderi</i> (A. Gray) Nelson & J.F. Macbr. ssp. <i>bolanderi</i>
Apiaceae	<i>Perideridia parishii</i> (J.M. Coult. & Rose) Nelson & J.F. Macbr. ssp. <i>latifolia</i> (A. Gray) Chuang & Constance
Asteraceae	<i>Antennaria pulchella</i> Greene
Asteraceae	<i>Arnica nevadensis</i> A. Gray
Asteraceae	<i>Arnica parryi</i> A. Gray
Asteraceae	<i>Artemisia ludoviciana</i> Nutt. ssp. <i>albula</i> (Wooton) D.D. Keck
Asteraceae	<i>Artemisia tridentata</i> Nutt. ssp. <i>vaseyana</i> (Rydb.) Beetle
Asteraceae	<i>Cirsium arizonicum</i> (A. Gray) Petr.
Asteraceae	<i>Cirsium arizonicum</i> (A. Gray) Petr. var. <i>arizonicum</i>
Asteraceae	<i>Erigeron inornatus</i> A. Gray var. <i>keilii</i> G.L. Nesom
Asteraceae	<i>Gnaphalium canescens</i> DC. ssp. <i>beneolens</i> (Davidson) Stebb. & D.J. Keil
Asteraceae	<i>Tonestus peirsonii</i> (D.D. Keck) G.L. Nesom & D.R. Morgan
Boraginaceae	<i>Amsinckia eastwoodiae</i> J.F. Macbr.
Boraginaceae	<i>Plagiobothrys torreyi</i> (A. Gray) A. Gray var. <i>diffusus</i> I.M. Johnst.
Boraginaceae	<i>Plagiobothrys torreyi</i> (A. Gray) A. Gray var. <i>torreyi</i>
Brassicaceae	<i>Arabis inyoensis</i> Rollins
Brassicaceae	<i>Descurainia incisa</i> (A. Gray) Britton ssp. <i>incisa</i>
Brassicaceae	<i>Rorippa curvipes</i> Greene var. <i>truncata</i> (Jeps.) Rollins
Cannabaceae	<i>Cannabis sativa</i> L.
Caprifoliaceae	<i>Symphoricarpos rotundifolius</i> A. Gray var. <i>rotundifolius</i>
Crassulaceae	<i>Sedum stenopetalum</i> Pursh
Cyperaceae	<i>Carex geyeri</i> Boott
Cyperaceae	<i>Carex lenticularis</i> Michx. var. <i>lipocarpa</i> (Holm) L. Standley
Cyperaceae	<i>Carex luzulina</i> Olney var. <i>luzulina</i>
Cyperaceae	<i>Carex tahoensis</i> F.J. Smiley
Cyperaceae	<i>Cyperus eragrostis</i> Lam.
Ericaceae	<i>Kalmia polifolia</i> Wangenh. ssp. <i>microphylla</i> (Hook.) Calder & Roy L. Taylor

Fabaceae	<i>Lotus stipularis</i> (Benth.) Greene var. <i>ottleyi</i> Isely
Fabaceae	<i>Lupinus andersonii</i> S. Watson
Fabaceae	<i>Lupinus nanus</i> Benth.
Juncaceae	<i>Juncus effusus</i> L. var. <i>pacificus</i> Fernald & Wiegand
Juncaceae	<i>Juncus hemiendytus</i> F.J. Herm. var. <i>hemiendytus</i>
Lamiaceae	<i>Monardella villosa</i> Benth. ssp. <i>villosa</i>
Liliaceae	<i>Allium membranaceum</i> Traub
Linaceae	<i>Linum lewisii</i> Pursh var. <i>alpicola</i> Jeps.
Onagraceae	<i>Gayophytum decipiens</i> F.H. Lewis & J. Szweykowski
Onagraceae	<i>Gayophytum heterozygum</i> F.H. Lewis & J. Szweykowski
Poaceae	<i>Agrostis stolonifera</i> L.
Poaceae	<i>Festuca saximontana</i> Rydb. var. <i>purpusiana</i> (St.-Yves) Fred. & Pavlick
Polemoniaceae	<i>Allophyllum divaricatum</i> (Nutt.) A.D. Grant & V.E. Grant
Polemoniaceae	<i>Ipomopsis aggregata</i> (Pursh) V.E. Grant ssp. <i>formosissima</i> (Greene) Wherry
Polemoniaceae	<i>Linanthus pachyphyllus</i> R. Patt.
Polemoniaceae	<i>Phlox austromontana</i> Coville
Polygonaceae	<i>Eriogonum hirtiflorum</i> S. Watson
Polygonaceae	<i>Eriogonum marifolium</i> Torr. & A. Gray
Polygonaceae	<i>Eriogonum nudum</i> Benth. var. <i>pubiflorum</i> Benth.
Polygonaceae	<i>Eriogonum spergulinum</i> A. Gray var. <i>pratense</i> (S. Stokes) J.T. Howell
Polygonaceae	<i>Eriogonum umbellatum</i> Torr. var. <i>furcosum</i> Reveal
Polygonaceae	<i>Polygonum persicaria</i> L.
Portulacaceae	<i>Calyptridium umbellatum</i> (Torr.) Greene var. <i>caudiciferum</i> (A. Gray) Jeps.
Portulacaceae	<i>Calyptridium umbellatum</i> (Torr.) Greene var. <i>umbellatum</i>
Portulacaceae	<i>Claytonia sibirica</i> L.
Pteridaceae	<i>Pellaea mucronata</i> (D.C. Eaton) D.C. Eaton var. <i>mucronata</i>
Ranunculaceae	<i>Delphinium nuttallianum</i> Pritz.
Ranunculaceae	<i>Thalictrum fendleri</i> A. Gray var. <i>fendleri</i>
Rhamnaceae	<i>Ceanothus palmeri</i> Trel.
Rosaceae	<i>Amelanchier alnifolia</i> (Nutt.) Nutt. var. <i>pumila</i> (Nutt.) Nelson
Rosaceae	<i>Potentilla grayi</i> S. Watson
Rubiaceae	<i>Galium hypotrichium</i> A. Gray ssp. <i>subalpinum</i> (Hilend & J.T. Howell) Ehrend.
Saxifragaceae	<i>Heuchera rubescens</i> Torr. var. <i>rydbergiana</i> Rosend. et al.
Saxifragaceae	<i>Lithophragma heterophyllum</i> (Hook. & Arn.) Torr. & A. Gray
Scrophulariaceae	<i>Collinsia torreyi</i> A. Gray var. <i>brevicarinata</i> Newsom
Typhaceae	<i>Sparganium emersum</i> Rehmman ssp. <i>emersum</i>

Appendix M - List of Taxa removed from the Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist, SEKI Flora.mdb

The following taxa were removed from the Sequoia and Kings Canyon National Parks vascular plant species checklist. These taxa were marked in the parks vascular plant species checklist database so they would not appear when a species list is generated for Sequoia and Kings Canyon National Parks. Reasons for removing these taxa from the parks checklist included:

1= Name was not recognized by Hickman (1993) or the Jepson Online Interchange for California Floristics. In most cases the nomenclature was out of date (followed that of Munz, 1959 & 1968).

2= Park checklist database reported the taxon as collected in the park and residing in the parks herbarium but upon inspection, vouchers in the parks herbarium tying the name to the checklist were not collected in the parks.

3= Park checklist database reported the taxon as collected in the parks and residing in the park herbarium but upon locating the vouchers in the parks herbarium tying the name to the checklist revealed the voucher's identification to be incorrect.

4= Park checklist database reported the taxon as collected in the parks and residing in a non-park herbarium but upon locating the vouchers in regional herbaria tying the name to the checklist revealed the voucher's identification to be incorrect.

Table 3: Taxa removed from Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist

	Family	Trinomial	Comments
2	Chenopodiaceae	Salsola tragus L.	Park checklist database reported this taxon as specimen collected in Parks and residing in Park herbarium. Parks herbarium voucher corresponds to collection location information in database but collection location is not in the Parks.
1	Fabaceae	Cytisus x. racemosus Nichol.	Species not recognized by Hickman (1993) or Jepson Interchange. Herbarium voucher tying the name to the checklist was verified at California Academy of Sciences and annotated to <i>Genista monspessulana</i> (L.) L.A.S. Johnson
4	Juncaceae	Juncus hemiendytus F.J. Herm.	Parks checklist database reported this taxon as specimen collected in Parks and residing in non-Park herbarium. Vouchers tying the name to the checklist were located and verified as either, <i>Juncus hemiendytus</i> F.J. Herm. var. <i>abjectus</i> (F.J. Herm.) Ertter or <i>Juncus hemiendytus</i> F.J. Herm. var. <i>hemiendytus</i> . All vouchers residing in regional herbaria were annotated by subject matter expert, B. Ertter.
2	Papaveraceae	Eschscholzia californica Cham.	Park checklist database reported this taxon as specimen collected in Parks and residing in Park herbarium. Parks herbarium vouchers correspond to collection location information in database but collection location is not in the Parks.
3	Papaveraceae	Eschscholzia	Park checklist database reported this taxon as specimen

		hypecoides Benth.	collected in Parks and residing in Park herbarium. Parks herbarium vouchers tying the name to the checklist were located and verified as <i>Eschscholzia caespitosa</i> Benth.
4	Poaceae	<i>Agrostis gigantea</i> Roth	Parks checklist database reported this taxon as specimen collected in Parks and residing in non-Park herbarium. Vouchers tying the name to the checklist were located and verified as <i>Agrostis stolonifera</i> L.
1	Poaceae	<i>Sitanion hansenii</i> (Scribn.) J.G. Sm.	Species not recognized by Hickman (1993) or Jepson Interchange. Herbarium vouchers tying the name to the checklist were verified in-house and annotated to <i>Elymus trachycaulus</i> (Link) Shinn. ssp. <i>subsecundus</i> (Link) Gould
1	Poaceae	<i>Torreyochloa pallida</i> (J. Presl) G.L. Church	The only taxonomic variety recognized by Hickman (1993) and the Jepson Interchange is <i>Torreyochloa pallida</i> (J. Presl) G.L. Church var. <i>pauciflora</i> (J. Presl) J.I. Davis, which was already on the parks species checklist. Name was mistakenly withheld.
4	Rosaceae	<i>Ivesia lycopodioides</i> A. Gray ssp. <i>lycopodioides</i>	Parks checklist database reported this taxon as specimen collected in Parks and residing in non-Park herbarium. Voucher tying the name to the checklist was located and verified as <i>Ivesia lycopodioides</i> A. Gray. Voucher was originally identified as <i>Ivesia lycopodioides</i> A. Gray. There were no comparison collections of var. <i>lycopodioides</i> available.
4	Scrophulariaceae	<i>Veronica serpyllifolia</i> L. ssp. <i>serpyllifolia</i>	Parks checklist database reported this taxon as specimen collected in Parks and residing in non-Park herbarium. Vouchers tying the name to the checklist were located and verified as, <i>Veronica serpyllifolia</i> L. ssp. <i>humifusa</i> (Dickson) Syme. Vouchers were originally identified only as <i>Veronica serpyllifolia</i> L.

Appendix N – Assigning Abundance to the Sequoia and Kings Canyon National Parks Vascular Plant Checklist provided to NPSpecies

The parks plant ecologist, Sylvia Haultain (Appendix A.3), provided the SEKI vascular plant species abundance data submitted to NPSpecies. Her description of this process is as follows:

As part of populating the NPSpecies database, all parks are required to assign each species on their vascular plant checklist to an abundance category. Table 4 defines the NPSpecies categories.

Table 4: Abundance Classes and results for NPSpecies Vascular Plant Checklist table

Class	NPSpecies Definition	SEKI Results
Abundant	Plants: Large number of individuals; wide ecological amplitude or occurring in habitats covering a large portion of the park.	11 taxa
Common	Plants: Large numbers of individuals predictably occurring in commonly	163 taxa

	encountered habitats but not those covering a large portion of the park.	
Uncommon	Plants: Few to moderate numbers of individuals; occurring either sporadically in commonly encountered habitats or in uncommon habitats.	748 taxa
Rare	Plants: Few individuals, usually restricted to small areas of rare habitat.	518 taxa
Unknown	Abundance unknown.	53 taxa; used when unable to determine abundance for ssp. or varieties
NA	Not Applicable – Abundance does not apply to the scientific name in the park.	--

We elected to base our class assignments on plot data. To do this, all of the vascular plant observations from the Natural Resource Inventory (Graber), Gradient Analysis Study (Stephenson), and the SEKI Vegetation Mapping project (Haultain) were combined into a master data table (*allobs*) within the database *allplottaxa.mdb*. This dataset brings together a grand total of 25,781 encounters of 1099 taxa on 1261 plots, which represents approximately 74% of the 1493 taxa currently included on the park checklist.

For the purpose of assigning abundance classes, the vegetation mapping plots were later taken out, as bias in plot location appeared to influence the abundance classes by inflating the number of encounters of relatively rare taxa. The resulting data table (*allobs NRI NS*) includes 18,200 encounters of 979 taxa on 839 plots (66% of the park checklist).

Frequency of encounter was calculated for each of these 979 taxa, and the resulting distribution used to identify preliminary boundaries between classes. Not surprisingly, this showed that most park taxa are rarely encountered. Only eleven taxa fell into the ‘abundant’ class according to the definition supplied by NPSpecies. Plants which were not encountered by any of the plots automatically were assigned to the ‘rare’ class. Final class assignments were made by evaluating the number of plots each plant occurred in and expert knowledge on local abundance once a plant is encountered. For each record, the questions “How likely is an observer to encounter this plant?” and “Once encountered, how many individuals are likely to be present?” were asked.

Note that the extreme elevation (and thus habitat) gradient that defines SEKI makes it difficult to assert that any one habitat covers “a large portion” of the parks. For this exercise, we concluded that the mixed coniferous forests and the alpine environments are the only two that met this criterion. Note also that ‘expert knowledge’ consisted of the plant ecologist spending approximately three days working up the data and less than a day evaluating the individual records.

Appendix O - NPSpecies Data Submission and Certification Process

NPSpecies requires all data to be submitted by the Inventory and Monitoring designated NPSpecies Point-of-Contacts (POC) to ensure the quality and integrity of NPSpecies data. Rose Cook is the POC and the Inventory and Monitoring Coordinator for the Sierra Nevada Network (Appendix A.3). All data submitted must go through a certification process. The certification is a quality control step to provide documentation that the species lists and associated attributes for a park and a taxa category have been reviewed for completeness and accuracy. Because NPSpecies is a dynamic database that will continue to

be used and new records added in the future, it is necessary to document when, and which data have been reviewed for completeness and accuracy. Thus users can qualify the use of the data for scientific, management and interpretive purposes, among others. Additionally the NPS is required to ensure and document the quality of data that it disseminates (see Director's Order 11b: Ensuring the Quality of Information Disseminated by the National Park Service; Director's Order 11b can be accessed through the NPSpecies website, Section 7).

In practice, the review of data will be coordinated by the POC with local experts that are well-versed in the biology, taxonomy and nomenclature of species at the respective parks. Upon completion of the review, the POC will complete the NPSpecies Quality Assurance Certification Form cooperatively with the reviewers and then submit the form along with an NPSpecies data file (QA form complete with instructions is available on-line). After the POC submits a completed certification, the Servicewide Inventory and Monitoring Program will conduct quality assurance procedures as an additional check to ensure data quality. If any inconsistencies are found, the POC will be contacted before the certification record and any data are uploaded into NPSpecies. After the certification process is complete, the Servicewide Inventory and Monitoring Program will conduct a download of the certified data from the master online NPSpecies to the desktop NPSpecies, and archive the file as a backup copy. It is recommended that the POC also make a backup copy.

The certification will apply to the review of species checklists and associated data contained in the master on-line version of NPSpecies. Certifications should be sent by email from the POC to Alison Loar, CSU - NPSpecies Data Manager (Appendix A.2).

The vascular plant voucher information database and the parks species checklist database for Sequoia and Kings Canyon National Parks were submitted to the Sierra Nevada Network NPSpecies POC, Rose Cook. The data files are currently in review for the certification process.

Appendix P - Vascular Plant Species Checklist of Sequoia and Kings Canyon National Parks (for submission to NPSpecies)

A database table was constructed that mirrored NPSpecies data structures for the NPSpecies parks species checklist database. The table was based upon specimen records collected from select western herbaria, the parks local vascular plant checklist and local knowledge of taxa in the parks but not yet listed on the parks vascular plant checklist (5 taxa, Athena Demetry, Appendix A.3). Data fields from the SEKI species checklist table were compared to NPSpecies checklist data fields using the NPSpecies Data Dictionary for Developers – Table and Field Structure (Section 7). All data fields submitted to NPSpecies follow data structures for NPSpecies version 2.

Table 5 lists all fields recognized by NPSpecies for a parks species checklist. Several NPSpecies data fields were not present in the parks species checklist database prior to this project. Data for these fields (Park Status, Abundance, Cultivation, Weedy, Pest, Management Priority, Exploitation Concern and TSN) were provided by local staff or outside sources; sources for these data are provided in Table 5 below.

Fields marked with an asterisk contain bracketed text listing field comments by Jennifer Akin or field source information.

Table 5: NPSpecies Data Field Definitions: Park-Species List

PARK-SPECIES LIST		
Label	Definition	Comments
*PARK-SPECIES LIST	The list of organisms for each park and associated information such as checklist fields, management fields	[Organisms are defined by NPSpecies as a biological entity identified by a scientific name at the taxonomic rank of species or lower]
Checklist Fields	Information commonly associated with species checklists including Park-Status, Abundance, Residency, Nativity and Cultivation.	The possible values for each of the Checklist Fields are mutually exclusive. Therefore, every name on a park's lists should have a value for each of the Checklist Fields. Additionally, the checklist fields are intended to be kept as current as reasonably possible and apply to the current boundary of the park unit. It is recognized that the value of one or more checklist fields for an organism may not be known with certainty at any given point in time. Additionally, the values that are assigned at any given point in time may vary by the individual that assigned them and their knowledge, and the availability and currency of evidence in NPSpecies, and elsewhere, at the time of the assignment. Consequently, "Unknown" and/or "NA" are valid values for each checklist field. The NPSpecies QA procedures accommodate this uncertainty and variability in developing current, complete and accurate species checklists.
Park Status	The current status of each species in each park.	Applicable only to organisms with the <i>Local List</i> checkbox checked. The possible values reflect a combination of confidence, and availability and currency of verifiable evidence in NPSpecies.
Present in Park	Species' occurrence in park is documented and assumed to be extant.	Extremely high confidence that the species is currently in the park. A current, verifiable reference, voucher or observation is included in NPSpecies.
Probably Present	Park is within species' range and contains appropriate habitat. Documented occurrences of the species in the adjoining region of the park give reason to suspect that it probably occurs within the park. The degree of probability may vary within this category, including	Very high confidence that the organism is currently in the park. Verifiable evidence may exist in NPSpecies, but is not considered current enough to elevate the status to Present in Park. Efforts should be made to obtain current, verifiable evidence in NPSpecies to elevate the Park Status to "Present in Park". If reasonable efforts to

	species that range from common to rare.	obtain current, verifiable evidence are unsuccessful, then the Park Status should be changed to Unconfirmed, Historic, Encroaching or False Report as applicable.
Unconfirmed	Included for the park based on weak ("unconfirmed record") or no evidence, giving minimal indication of the species' occurrence in the park.	Any confidence from very low to high that the organism is currently in the park. Verifiable evidence may exist in NPSpecies, but it is not considered sufficient enough to elevate the status to Probably Present, nor current enough to elevate the status to Present. Efforts should be made to obtain current, verifiable evidence in NPSpecies to elevate the Park Status to "Present in Park". If reasonable efforts to obtain current, verifiable evidence are unsuccessful, then the Park Status should be changed to Historic, Encroaching or False Report as applicable.
Encroaching	The species is not documented in the park, but is documented as being adjacent to the park and has potential to occur in the park.	Extremely low confidence that the organism is currently in the park, but extremely high confidence that the organism is currently adjacent to the park. Verifiable evidence may exist in NPSpecies documenting the occurrence in the park, but it is not current. Potential invasive organisms are good candidates for this Park Status designation, either before they enter a park or after they have been eliminated from a park.
Historic	Species' historical occurrence in the park is documented, but recent investigations indicate that the species is now probably absent.	Extremely low confidence that the organism is currently in the park. Verifiable evidence exists in NPSpecies, but is not current. Extinct, extirpated or eliminated species are candidates for a Historic <i>Park Status</i> designation.
False Report	Species previously reported to occur within the park, but current evidence indicates that the report was based on a misidentification, a taxonomic concept no longer accepted, or some other similar problem of interpretation.	Extremely low confidence that the organism is currently in the park. Evidence exists in NPSpecies, but it cannot be sufficiently verified.
NA	Not Applicable - Park-Status does not apply to the scientific name for the park.	The NA value prevents null values from appearing in NPSpecies and applies to 2 primary situations: 1) An outdated scientific name that is not used in the locale of the park for an organism, but is in NPSpecies for a park because of the inclusion of vouchers, observations or names

		linked to references. Note that outdated names are reconciled in NPSpecies with the LOCAL CLASSIFICATION system. 2) Vouchers, observations or names linked to references have not been identified at the species level or lower, but are included in NPSpecies with the name of a higher taxonomic rank than the species level. The names of these higher level taxonomic ranks will disappear from NPSpecies if the evidence of the respective name are identified to the species level or lower, and are changed appropriately in NPSpecies.
*Abundance	The current abundance of each organism in each park.	Applicable only to organisms with the <i>Local List</i> checkbox checked and a <i>Park Status</i> of "Present". The values attempt to balance abundance with suitable habitat, and temporal/behavioral considerations. In practice, the entered value should apply (although there are numerous exceptions) to the abundance in the most suitable habitat of the organism in the park. A future generation of NPSpecies will address the coding of <i>Abundance</i> to separate out the temporal and behavioral aspects. The Data Source field for Abundance is available to provide a citation that specifically addresses abundance in more detail. [Data provided by Sylvia Haultain, Appendix A.3, Appendix N]
Abundant	Plants: Large number of individuals; wide ecological amplitude or occurring in habitats covering a large portion of the park.	
Common	Plants: Large numbers of individuals predictably occurring in commonly encountered habitats but not those covering a large portion of the park.	
Uncommon	Plants: Few to moderate numbers of individuals; occurring either sporadically in commonly encountered habitats or in uncommon habitats.	

Rare	Plants: Few individuals, usually restricted to small areas of rare habitat.	
Unknown	Abundance unknown.	
NA	Not Applicable – Abundance does not apply to the scientific name in the park.	All names on a park’s list that do not have a <i>Park Status</i> of Present should have a <i>Residency</i> of NA.
*Nativity	Nativity classification for each organism for each park.	Applicable only to organisms with the <i>Local List</i> checkbox checked. If the park-status of an organism is not “Present in Park”, then nativity represents the nativity if the organism were eventually confirmed in the park. [Data provided by the University and Jepson Herbaria, revised by Athena Demetry to reflect park nativity, Appendix E, Appendix A.3]
Native	The organism is native, or would be native, to the park (either endemic or indigenous).	
Non-Native	The organism is not native, or would not be native, to the park (neither endemic nor indigenous).	Cultivated organisms as defined under the <i>Cultivation</i> field are also considered non-native.
Unknown	Nativity is unknown relative to the park.	
NA	Not Applicable	Applies to names that do not represent organism names for the locale of the park.
*Cultivation	Cultivation classification for each non-native organism in each park.	Applicable only to organisms with the <i>Local List</i> checkbox checked, a <i>Park Status</i> of "Present" or "Probably Present" and a <i>Nativity</i> of Non-Native. Cultivation is intended to distinguish between non-native organisms that were introduced as part of a park’s mission, and non-native organisms that occur in the park naturally. Cultivation was not intended to apply to organisms that are cultivated for landscape purposes and have not persisted into the natural environment, for example plants in gardens or terrariums, or animals in enclosures. In general, NPSpecies was not intended to include controlled, “domestic” organisms. [Data provided by Athena Demetry, Appendix A.3]
Cultivated	A non-native species that is currently cultivated in the park.	
Persistent	A non-native species that persists in the park (either reproducing or	

	non-reproducing) from a previous cultivation in the park.	
Not Cultivated	A non-native species that is not currently cultivated in the park.	
Unknown	A non-native species for which the cultivation in the park is currently unknown.	
NA	Not Applicable – Cultivation does not apply to the non-native scientific name in the park.	All names on a park’s list that do not have a <i>Park Status</i> of Present or Probably Present and a <i>Nativity</i> of Non-native should have a Cultivation of NA.
Management Fields	Information related to the management of organisms at a park such as Weedy Plant, Pest, Management Priority and Exploitation Concern.	Applicable only to organisms with the <i>Local List</i> checkbox checked.
*Weedy Plant	Yes/No field for plant species only. Plant species are considered "weedy" or "invasive" if they (a) occur almost exclusively in disturbed habitats, (b) relatively recently occupied natural habitats in competition with native species, or (c) occur across a broad range of ecological conditions.	The definition of <i>Weedy Plant</i> has been found to be too general to be of use from both an ecological and managerial perspective. The <i>Pest</i> field was added to provide a more narrowly definition that was specifically oriented to management. No similarly narrow counterpart to the ecological aspects of the definition of <i>Weedy Plant</i> is currently in NPSpecies. [Data provided by Athena Demetry, Appendix A.3]
*Pest	Yes/No if a species is a “pest” in the park. “Pests are living organisms that interfere with the purposes or management objectives of a specific site within a park, or that jeopardize human health and safety.” (NPS Management Policies 2001. Section 4.4.5.1)	Organisms identified by the park’s Chief of Natural Resources or Invasive Species Management Team, or addressed in a park’s Resource Management Plan or APCAM database are good candidates for having <i>Management Priority</i> checked in NPSpecies. [Data provided by Athena Demetry, Appendix A.3]
*Management Priority	Yes/No flag if a species is a management priority in the park.	Organisms identified by the park’s chief of Natural Resources or addressed in a park’s Resource Management Plan are good candidates for having <i>Management Priority</i> checked in NPSpecies. [Data provided by Athena Demetry, Appendix A.3]
*Exploitation Concern	Yes/No if a species is an exploitation concern in the park.	Organisms identified by a park’s law enforcers or contained within the Critical Incident Report System database are good candidates for having the <i>Exploitation Concern</i> checked in NPSpecies.

		[Data provided by Sylvia Haultain, Appendix A.3]
*TSN	Integrated Taxonomic Information System's Taxonomic Serial Number (TSN): unique number assigned to uniquely identify species on a national basis.	[This field was not listed in the NPSpecies Park-Species list but was provided to NPSpecies for each taxon as NPSpecies recognizes TSN to uniquely identify an entity]

NPSpecies presents the Local Classification data fields (Table 6 below) separate from the Parks-Species fields. For this project, the Local Classification fields were added to the Park-Species fields (Table 5 above) and submitted to NPSpecies in one database table.

Submitting the Local Classification fields was important because the NPSpecies on-line database generates a "Certified Organism List" for each park. The Certified Organism List represents taxa that are present or probably present in the park. Certified Organism Lists are generated through a combination of various values in the NPSpecies database; specifically the Local List field (identifies which names represent organisms for the park) must be checked and the Park-Status field (identifies which organisms are in a park) must be listed as present or probably present. Organisms are defined by NPSpecies as a biological entity identified by a scientific name at the taxonomic rank of species or lower.

Fields marked with an asterisk contain bracketed text listing field source information.

Table 6: NPSpecies Data Field Definitions: Local Classification

LOCAL CLASSIFICATION		
Label	Definition	Comments/Examples
LOCAL CLASSIFICATION	Information entered to define which names are used locally to represent which organisms in each park and under which name related evidence records should appear.	
Local List	Yes/No whether the Standard Scientific Name/TSN is the name used in the locale of the park for an organism, regardless of the current Park-Status of the organism in the park.	The inclusion in NPSpecies of outdated names of vouchers, observations and those documented in references as a result of synonyms, lumping/splitting, spelling variations, etc. may result in lists of names for a park that are greater than the number of organisms for the park. Completing this checkbox identifies the subset of names that the park will use to communicate the organisms for the park. Note that this checkbox applies to all organisms regardless of the current status of the organism in the park (currently present, probably present, unconfirmed, historic, encroaching or false report). All names that are not checked should have a <i>Park-Status</i> of Not Applicable

		(NA). The combination of Local List being checked, a Park-Status of Present or Probably Present, and those names with a Taxonomic Rank of species or lower represents the list of organisms in the park. This list can be generated in NPSpecies as the “Organisms” Quick List.
Local Accepted Name	The scientific name used in the locale of the park for an organism, regardless of the current status of the organism in the park.	The entry of the <i>Local Accepted Name</i> allows the outdated names of vouchers, observations and those documented in references to be presented under the names of organisms used in the locale of the park as defined by the <i>Local List</i> checkbox. This assignment addresses the common situation where by an organism appears undocumented by vouchers, observations or references, but in actuality they are documented under an outdated name. By default, NPSpecies will assign the <i>Local Accepted Name</i> as itself if the <i>Local List</i> checkbox is checked. For names in which the <i>Local List</i> checkbox is not checked, the user may select the name from the <i>Local List</i> under which the vouchers, observations and references should appear.
Local Accepted TSN	The TSN that represents the Local Accepted Name.	As with all names that are selected from a pick-list in NPSpecies (in contrast to names that are typed in directly), the TSN that represents the name is actually stored in NPSpecies, not the name itself.
Preferred Local Names	Scientific and common names preferred locally and entered as alternatives to the names in the Standard Classification.	The <i>Preferred Local Names</i> are used in NPSpecies only for display and searching purposes. They are not intended to reconcile taxonomic issues such as synonymy, lumping/splitting, spelling variations, etc.
*Preferred Local Scientific Name	An alternate scientific name preferred over the <i>Standard Scientific Name</i> provided by the standard classification system.	Authorities are commonly embedded in the <i>Preferred Local Scientific Name</i> . [Field filled with the currently accepted nomenclature following that of the Jepson Online Interchange for California Florists, Section 4.3]
*Preferred Local Common Name(s)	Alternate common name(s) preferred over, or absent from, the <i>Standard Common Name(s)</i> provided by the standard classification system.	[Field filled with the common name primarily following that of the 1993 edition of <i>The Jepson Manual</i> , data derived from the parks species checklist database, SEKI Flora.mdb]

Appendix Q – Undocumented Taxa listed on Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist

This table contains all taxa listed on the Sequoia and Kings Canyon National Parks vascular plant species checklist for which a voucher has not been located (60 taxa). Efforts should continue to fully document the parks checklist by seeking vouchers for these undocumented taxa. Included in this list is the status of each taxon as reported in the parks local vascular plant species checklist database, SEKI Flora.mdb.

Field Herbstatus:

2 = Specimen reportedly collected in parks and residing in non-park herbarium

3 = Specimen residing in parks' herbarium but collected outside parks; species thought to be present in parks

4 = No specimen in parks' herbarium (or elsewhere from parks), but has been identified as in the parks

* = Recent addition by Athena Demetry, February 25, 2005. These taxa are not included in the parks vascular plant species checklist at this time. These are non-native species reported in an alien plant species threat assessment project (Gerlach *et al.* 2003) and included recently to provide a complete list of taxa occurring in the parks. These taxa were not searched for in regional herbaria but the likelihood of locating these specimens in a herbarium is very slim.

Table 7: Non-Vouchered Taxa listed on the Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist

Family	Trinomial	Herbstatus
Apiaceae	<i>Lomatium caruifolium</i> (Hook. & Arn.) J.M. Coult. & Rose var. <i>denticulatum</i> Jeps.	2
Apiaceae	<i>Lomatium nevadense</i> (S. Watson) J.M. Coult. & Rose var. <i>nevadense</i>	2
Apocynaceae	<i>Apocynum cannabinum</i> L.	2
Asteraceae	<i>Antennaria argentea</i> Benth.	2
Asteraceae	<i>Arnica latifolia</i> Bong.	2
Asteraceae	<i>Bellis perennis</i> L.	2
Asteraceae	<i>Coreopsis bigelovii</i> (A. Gray) H.M. Hall	3
Asteraceae	<i>Hemizonia pungens</i> (Hook. & Arn.) Torr. & A. Gray ssp. <i>pungens</i>	3
Asteraceae	<i>Hieracium gracile</i> Hook. var. <i>detonsum</i> (A. Gray) A. Gray	2
Asteraceae	<i>Hulsea vestita</i> A. Gray ssp. <i>pygmaea</i> (A. Gray) Wilken	2
Asteraceae	<i>Layia glandulosa</i> (Hook.) Hook. & Arn.	2
Asteraceae	<i>Wyethia angustifolia</i> (DC.) Nutt.	3
Boraginaceae	<i>Amsinckia menziesii</i> (Lehm.) Nelson & J.F. Macbr. var. <i>menziesii</i>	4
Boraginaceae	<i>Cryptantha circumscissa</i> (Hook. & Arn.) I.M. Johnst.	2
Brassicaceae	<i>Arabis bodiense</i> Rollins	4
Brassicaceae	<i>Arabis repanda</i> S. Watson var. <i>greenei</i> Jeps.	2
Caprifoliaceae	<i>Sambucus melanocarpa</i> A. Gray	2
Cyperaceae	<i>Cyperus bipartitus</i> Torr.	4
Cyperaceae	<i>Eleocharis montevidensis</i> Kunth	2
Fabaceae	<i>Astragalus didymocarpus</i> Hook. & Arn.	2
Fabaceae	<i>Trifolium longipes</i> Nutt.	3

Hydrophyllaceae	Hesperochiron californicus (Benth.) S. Watson	4
Hydrophyllaceae	Nemophila heterophylla Fisch. & C.A. Mey.	2
Hydrophyllaceae	Phacelia congdonii Greene	3
Isoetaceae	Isoetes howellii Engelm.	2
Juglandaceae	Juglans californica S. Wats.	*
Juncaceae	Juncus kelloggii Engelm.	2
Liliaceae	Brodiaea coronaria (Salisb.) Engl. ssp. coronaria	3
Liliaceae	Leucojum aestivum L.	*
Linaceae	Hesperolinon micranthum (A. Gray) Small	4
Onagraceae	Camissonia graciliflora (Hook. & Arn.) P.H. Raven	2
Papaveraceae	Corydalis caseana A. Gray ssp. caseana	4
Papaveraceae	Platystemon californicus Benth.	3
Poaceae	Deschampsia atropurpurea (Wahlenb.) Scheele	2
Poaceae	Festuca kingii (S. Watson) Cassidy	2
Poaceae	Hordeum brachyantherum Nevski ssp. californicum (Covas & Stebb.) Bothmer, N. Jacobsen & Seberg	2
Poaceae	Pascopyrum smithii (Rydb.) A. Löve	2
Poaceae	Poa cusickii Vasey ssp. Cusickii	4
Poaceae	Polypogon australis Brongn.	*
Poaceae	Puccinellia nuttalliana (Schult.) Hitchc.	4
Poaceae	Schismus barbatus (L.) Thell.	2
Polemoniaceae	Gilia campanulata A. Gray	2
Polemoniaceae	Polemonium californicum Eastw.	2
Polygonaceae	Eriogonum rosense A. Nelson & P.B. Kenn.	2
Polygonaceae	Polygonum argyrocoleon Kunze	2
Polygonaceae	Polygonum parryi Greene	2
Polypodiaceae	Polypodium hesperium Maxon	2
Rosaceae	Ivesia gordonii (Hook.) Torr. & A. Gray	2
Rosaceae	Ivesia unguiculata A. Gray	2
Rosaceae	Potentilla glandulosa Lindl. ssp. hansenii (Greene) D.D. Keck	4
Rosaceae	Potentilla gracilis Hook. var. elmeri (Rydb.) Jeps.	4
Rosaceae	Prunus persica (L.) Batsch	*
Rosaceae	Rosa californica Cham. & Schldl.	2
Rubiaceae	Galium multiflorum Kellogg	2
Saururaceae	Anemopsis californica (Nutt.) Hook. & Arn.	2
Scrophulariaceae	Mimulus kelloggii (Greene) A. Gray	2
Scrophulariaceae	Mimulus layneae (Greene) Jeps.	4
Scrophulariaceae	Mimulus torreyi A. Gray	2
Viscaceae	Phoradendron densum Trel.	4
Vitaceae	Vitis vinifera L.	*

Appendix R – Generating the Sequoia and Kings Canyon National Parks Vascular Plant Checklist from the NPSpecies Vascular Plant Checklist table, retaining *sensu latu* taxa

The checklist submitted to NPSpecies contains names for all specimen records in the voucher database table. Several steps were taken to ensure the parks species checklist was not artificially inflated. One of these steps involved not including *sensu latu* taxa in which a subspecific taxon(a) was also present on the parks species checklist. This was accomplished by assigning the Park Status of these taxa as not applicable. Two exceptions were made for retaining *sensu latu* taxa on the parks checklist: *Ribes menziesii* Pursh and *Cirsium arizonicum* (A. Gray) Petr. *Sensu latu* means ‘in the broad sense’ (L.) and refers to using a taxon inclusively to embrace two or more subspecific taxa. Reasons for retaining these *sensu latu* taxa were as follows:

1. The corresponding subspecific taxon for *Ribes menziesii* Pursh (var. *ixoderme* Quick) is not formally recognized by Hickman (1993) but elevating the status of this variety is in question by the Jepson Online Interchange for California Floristics. This variety is present in the parks and is listed as a 1B plant by the California Native Plant Society. Plants on the 1B list are rare, threatened, or endangered in California and elsewhere.

2. The corresponding subspecific taxon for *Cirsium arizonicum* (A. Gray) Petr. (var. *arizonicum*) is also not formally recognized by Hickman (1993) or by the Jepson Online Interchange for California Floristics but is recognized by the Integrated Taxonomic Information System. A specimen for this taxon was sent to the subject matter expert, who identified the specimen as *Cirsium arizonicum* (A. Gray) Petr. var. *arizonicum*. As the variety is not recognized by current nomenclature, we retained the *sensu latu* name which is recognized.

Appendix S - Vascular Plant Voucher Records (for submission to NPSpecies)

A database table was constructed that mirrored NPSpecies data structures for the NPSpecies voucher database. The table was based upon specimen records collected from the local parks herbarium and select regional herbaria in California known to contain collections from Sequoia and Kings Canyon National Parks. Data fields for the Sequoia and Kings Canyon National Parks voucher record database were compared to NPSpecies voucher data fields using the NPSpecies Data Dictionary for Developers – Table and Field Structure (Section 7). All data fields submitted to NPSpecies follow data structures for NPSpecies version 2.

Table 8 lists all fields recognized by NPSpecies for voucher and observations data. Several NPSpecies data fields required various methods or decisions to generate the appropriate data (Documented Scientific Name, Sensitivity and Comments). The methods/decisions for these fields are provided in the table below except for the Documented Scientific Name field. This field required multiple steps to gather the appropriate data which are described at the end of this appendix. All other fields are documented in the metadata associated with this database table.

Fields marked with an asterisk contain bracketed text listing field comments by Jennifer Akin or field source information.

Table 8: NPSpecies Data Field Definitions: Vouchers and Observations

VOUCHERS AND OBSERVATIONS		
Label	Definition	Comments/Examples
VOUCHERS AND OBSERVATIONS		
Identification	Information to identify the source of the data record and the physical object including Park-Code, TSN, Scientific Name, Steward/Repository, Voucher/Observation ID.	
*Park Code	Park Code is ubiquitous throughout the database.	[4-Character Park Code]
*TSN	<i>TSN</i> is ubiquitous throughout the database and represents several taxonomic/nomenclature fields including <i>Standard Scientific Name, Kingdom, Category, Order, Family, Rank, Authority, Standard List, Standard Accepted Name, Standard Accepted TSN, Local List, Local Accepted Name, Local Accpeted TSN.</i>	[Integrated Taxonomic Information System's Taxonomic Serial Number (TSN): unique number assigned to uniquely identify species on a national basis]
*Standard Scientific Name	<i>Standard Scientific Name</i> is ubiquitous throughout the database and is directly linked to a TSN.	[This field is system generated]
Steward / Repository	Vouchers only. Acronym, name and address of herbarium, museum, collection or other location where voucher specimen is stored.	
Voucher ID	Vouchers only. Identification number of voucher specimen (ID number provided by the repository, as contrasted with the collector number provided by the collector).	
Sensitivity	The sensitivity of the Voucher or Observation record including Park-Only, NPS-Only and Public.	
*Sensitivity	Security level based on the sensitivity of this particular voucher or observation record.	[Species listed by the California Native Plant Society as rare, threatened, or endangered in California and elsewhere (1B list) were assigned "NPS Only". All other records were assigned a "Public" level of access]

Public	No access restrictions	
NPS Only	Restricted to National Park Service staff	
Park Only	Restricted to park staff specified in Park Code	
Event	Information associated with the date/time that the voucher was collected or the observation was made, including date, time, collector/observer, habitat, etc.	
*Documented Scientific Name	Scientific name that was documented when the species was collected or observed (the name on the original label for vouchers or as recorded for observations).	[See description at the end of this appendix listing methods used to generate appropriate data for this field]
Date	Date that the voucher was collected or the observation was made, or the beginning date of a date-range if the exact date is unknown.	
End Date	The end date of a date-range if the exact date that the voucher was collected or that the observation was made is unknown.	
Time	Time of observation or collection (24-hour clock).	
Collector or Observer	Name(s) of collector(s) or observer(s).	Separate with commas if more than one.
Collector or Observer ID	The original ID assigned to the voucher or observation by the collector or observer at the time of collection or observation.	This is a traditional, standard datum recorded in field notes and on labels of vouchers by the collector at the time of the collection. This is not an ID assigned later during cataloging (see <i>Voucher ID</i>).
Voucher Type	The type of voucher.	
Specimen	Whole or partial specimen (e.g. skin, bone, egg, blood, etc.) Specify in details.	
Image	Hardcopy or digital image.	
Audio Recording	Tape or digital audio recording	
Other	Voucher other than specimen, image or audio recording. Specify in details.	
Habitat	Description of habitat where observation or collection was made.	
Location	Information associated with where the voucher was collected or the	

	observation was made, including lat/long or UTM coordinates, elevation, locality description, etc.	
From Park	Yes/No/Unkown whether the voucher was collected or the observation was made inside the park boundary.	
Elevation	Elevation where observation or collection was made.	
Units	Units for elevation (feet or meters).	
Description	Concise description of observation or collection site within the park, or location given on specimen label for historical specimens.	
Local Location Code	An optional code identifying a permanent locally recognized location where the observation or collection was made. Can be used in lieu of coordinates when numerous records need to be added.	
Latitude(DD)	Latitude in decimal degrees where the observation or collection was made.	
Longitude(DD)	Longitude in decimal degrees where the observation or collection was made.	
UTM X	UTM X coordinate (easting) where the observation or collection was made.	
UTM Y	UTM Y coordinate (northing) where the observation or collection was made.	
UTM Zone	UTM Zone of X and Y coordinates for the observation or collection.	
UTM Datum	Datum for UTM coordinates (i.e. NAD27 or NAD83).	
Coordinate Error (meters)	Estimated accuracy of the location coordinates in meters.	
*Comments	Data recorded on the specimen label which does not fall into a data field listed above.	[This field was not listed in the NPSpecies Data definitions but is present in the on-line database for vouchers and observations. This field was typically filled with annotation information]

The **Documented Scientific Name** field is defined by NPSpecies as the name on the original record when the species was collected. The following list describes the strategy behind filling this field for voucher records located in the SEKI Herbarium. Data for the Documented Scientific Name field was not provided

for voucher records by any regional herbaria databases. Data for this field was recorded while examining vouchers during site visits to regional herbaria.

1. Voucher specimen with information in the SEKI Herbarium museum database, ANCS+, pertaining to the specimens' original determination or original identification. When available, the original identification information was used to fill the Documented Scientific Name field.

2. Voucher specimen collected from 1993 to the present. We assumed that nomenclature for these specimens would have followed that of Hickman (1993). There are 476 records in the SEKI museum collections database, ANCS+, with collection dates ranging from that time period. Local knowledge of these collectors by SEKI Plant Ecologist, Sylvia Haultain confirmed that filling the Documented Scientific Name field with Hickman (1993) nomenclature was a safe assumption.

3. Voucher specimen collected in 1959 and through collections made in 1992. We assumed that nomenclature for these specimens would have followed that of the accepted flora of the time, Munz (1959, 1968).

In order to rectify shortcomings of the vascular plant voucher data housed in the SEKI museum database, ANCS+, that limited the databases' usefulness to park managers and researchers (National Park Service 1999) the following changes were made by Brent Johnson in 1999. One result was to assign each record an appropriate Jcode. Jcode was designed to allow SEKI staff to manage and store plant observation data in an efficient way and to tie taxa to the parks flora database (Jflora.mdb). Jcode is a unique 4-letter + 2-number code derived from the first two letters of the genus and of the species given in *The Jepson Manual* (Hickman 1993) with the numbers assigned to distinguish between similar Jcodes. In addition, Mcode (Munz code) was also assigned in the 1999 effort. Mcode is virtually identical to Jcode except the nomenclatural code is based upon that of Munz (1965, 1968). Jcode was assigned to each voucher record in most cases but not all. Cases in which Jcode were not assigned were typically due to problems concerning the plants identification.

Vouchers were manually examined in the herbarium (286 vouchers) to determine the name of the specimen at time of collection for those cases where 1) a Mcode was not assigned but a Jcode was assigned, 2) if neither Jcode or Mcode were assigned, or 3) if there was a difference between the plant trinomial recorded in the Munz trinomial field versus the plant trinomial recorded in an archival scientific name field. The archival scientific name field came from an archival copy of the ANCS+ database prior to the nomenclature being updated to that of Hickman (1993). If the specimen's nomenclature was informally annotated (i.e. hand annotated typically with authority or subspecies taxon), the annotation was also included in the Documented Scientific Name field. For those voucher records in which the assigned Mcode and Jcode were identical (indicating no change in taxonomy during the Munz to Hickman translation), we filled the Documented Scientific Name field with the Munz nomenclature.

4. Voucher specimens collected prior to 1959 (pre Munz) or for which the collection year was unknown. Nomenclature for these specimens could have come from various sources. These specimens (285 vouchers) were manually examined in the herbarium to determine the name at time of collection. If the specimens' nomenclature was informally annotated (i.e. hand written annotations typically documenting the authority or subspecies taxon), the name as annotated was included in the Documented Scientific Name field.

A total of 580 specimens were manually examined in the SEKI Herbarium to determine the original name at time of collection; 569 of these were collected within Sequoia and Kings Canyon National Parks and 11 were not collected in the parks. Specimens not collected in the parks were not included in the voucher table. Not all specimen residing in the SEKI Herbarium that were assigned a collection location outside the parks boundaries and had a collection date during Munz or pre Munz nomenclatural times were manually examined to determine name at time of collection. Only a small subset of vouchers not collected in the parks were manually examined as it was necessary to gather more information concerning the

specimens' collection location to accurately assign a park collection location. For these cases, name at time of collection or documented scientific name was also noted.

Appendix T – Local Vascular Plant Species Checklist of Sequoia and Kings Canyon National Parks

This table lists the vascular plant species checklist of Sequoia and Kings Canyon National Parks (1,545 taxa). Nomenclature follows that of the Jepson Online Interchange for California Floristics (2005).

Table 9: Sequoia and Kings Canyon National Parks Vascular Plant Species Checklist

Family	Trinomial	Nativity
Aceraceae	<i>Acer glabrum</i> Torr. var. <i>diffusum</i> (Greene) F.J. Smiley	native
Aceraceae	<i>Acer glabrum</i> Torr. var. <i>torreyi</i> (Greene) F.J. Smiley	native
Aceraceae	<i>Acer macrophyllum</i> Pursh	native
Alismataceae	<i>Sagittaria cuneata</i> E. Sheldon	native
Amaranthaceae	<i>Amaranthus albus</i> L.	non-native
Amaranthaceae	<i>Amaranthus blitoides</i> S. Watson	native
Amaranthaceae	<i>Amaranthus retroflexus</i> L.	non-native
Anacardiaceae	<i>Rhus trilobata</i> Torr. & A. Gray	native
Anacardiaceae	<i>Toxicodendron diversilobum</i> (Torr. & A. Gray) Greene	native
Apiaceae	<i>Angelica breweri</i> A. Gray	native
Apiaceae	<i>Angelica callii</i> Mathias & Constance	native
Apiaceae	<i>Angelica lineariloba</i> A. Gray	native
Apiaceae	<i>Anthriscus caucalis</i> M. Bieb.	non-native
Apiaceae	<i>Berula erecta</i> (Huds.) Coville	native
Apiaceae	<i>Bowlesia incana</i> Ruiz & Pav.	native
Apiaceae	<i>Cicuta douglasii</i> (DC.) J.M. Coult. & Rose	native
Apiaceae	<i>Cymopterus terebinthinus</i> (Hook.) M.E. Jones var. <i>californicus</i> (J.M. Coult. & Rose) Jeps.	native
Apiaceae	<i>Cymopterus terebinthinus</i> (Hook.) M.E. Jones var. <i>petraeus</i> (M.E. Jones) Goodrich	native
Apiaceae	<i>Daucus pusillus</i> Michx.	native
Apiaceae	<i>Eryngium spinosepalum</i> Mathias	native
Apiaceae	<i>Heracleum lanatum</i> Michx.	native
Apiaceae	<i>Ligusticum grayi</i> J.M. Coult. & Rose	native
Apiaceae	<i>Lomatium caruifolium</i> (Hook. & Arn.) J.M. Coult. & Rose var. <i>denticulatum</i> Jeps.	native
Apiaceae	<i>Lomatium dissectum</i> (Torr. & A. Gray) Mathias & Constance var. <i>multifidum</i> (Torr. & A. Gray) Mathias & Constance	native
Apiaceae	<i>Lomatium nevadense</i> (S. Watson) J.M. Coult. & Rose var. <i>nevadense</i>	native
Apiaceae	<i>Lomatium nevadense</i> (S. Watson) J.M. Coult. & Rose var. <i>parishii</i> (J.M. Coult. & Rose) Jeps.	native
Apiaceae	<i>Lomatium torreyi</i> (J.M. Coult. & Rose) J.M. Coult. & Rose	native
Apiaceae	<i>Lomatium utriculatum</i> (Torr. & A. Gray) J.M. Coult. & Rose	native

Apiaceae	<i>Oreonana clementis</i> (M.E. Jones) Jeps.	native
Apiaceae	<i>Oreonana purpurascens</i> Shevock & Constance	native
Apiaceae	<i>Osmorhiza brachypoda</i> Torr.	native
Apiaceae	<i>Osmorhiza chilensis</i> Hook. & Arn.	native
Apiaceae	<i>Oxypolis occidentalis</i> J.M. Coult. & Rose	native
Apiaceae	<i>Perideridia bolanderi</i> (A. Gray) Nelson & J.F. Macbr. ssp. <i>bolanderi</i>	native
Apiaceae	<i>Perideridia parishii</i> (J.M. Coult. & Rose) Nelson & J.F. Macbr. ssp. <i>latifolia</i> (A. Gray) Chuang & Constance	native
Apiaceae	<i>Sanicula bipinnata</i> Hook. & Arn.	native
Apiaceae	<i>Sanicula crassicaulis</i> DC.	native
Apiaceae	<i>Sanicula graveolens</i> DC.	native
Apiaceae	<i>Sanicula tuberosa</i> Torr.	native
Apiaceae	<i>Sphenosciadium capitellatum</i> A. Gray	native
Apiaceae	<i>Tauschia hartwegii</i> (A. Gray) J.F. Macbr.	native
Apiaceae	<i>Torilis arvensis</i> (Huds.) Link	non-native
Apiaceae	<i>Torilis nodosa</i> (L.) Gaertn.	non-native
Apiaceae	<i>Yabea microcarpa</i> (Hook. & Arn.) Koso-Polj.	native
Apocynaceae	<i>Apocynum androsaemifolium</i> L.	native
Apocynaceae	<i>Apocynum cannabinum</i> L.	native
Apocynaceae	<i>Nerium oleander</i> L.	non-native
Apocynaceae	<i>Vinca major</i> L.	non-native
Araliaceae	<i>Hedera helix</i> L.	non-native
Aristolochiaceae	<i>Asarum hartwegii</i> S. Watson	native
Aristolochiaceae	<i>Asarum lemmonii</i> S. Watson	native
Asclepiadaceae	<i>Asclepias californica</i> Greene ssp. <i>californica</i>	native
Asclepiadaceae	<i>Asclepias californica</i> Greene ssp. <i>greenei</i> Woodson	native
Asclepiadaceae	<i>Asclepias cordifolia</i> (Benth.) Jeps.	native
Asclepiadaceae	<i>Asclepias eriocarpa</i> Benth.	native
Asclepiadaceae	<i>Asclepias fascicularis</i> Decne.	native
Asclepiadaceae	<i>Asclepias speciosa</i> Torr.	native
Aspleniaceae	<i>Asplenium septentrionale</i> (L.) Hoffm.	native
Asteraceae	<i>Achillea millefolium</i> L.	native
Asteraceae	<i>Adenocaulon bicolor</i> Hook.	native
Asteraceae	<i>Ageratina occidentalis</i> (Hook.) R.M. King & H. Rob.	native
Asteraceae	<i>Agoseris aurantiaca</i> (Hook.) Greene	native
Asteraceae	<i>Agoseris elata</i> (Nutt.) Greene	native
Asteraceae	<i>Agoseris glauca</i> (Pursh) Raf. var. <i>monticola</i> (Greene) Q. Jones	native
Asteraceae	<i>Agoseris grandiflora</i> (Nutt.) Greene	native
Asteraceae	<i>Agoseris heterophylla</i> (Nutt.) Greene	native
Asteraceae	<i>Agoseris retrorsa</i> (Benth.) Greene	native

Asteraceae	Ambrosia acanthicarpa Hook.	native
Asteraceae	Anaphalis margaritacea (L.) Benth. & Hook.	native
Asteraceae	Antennaria argentea Benth.	native
Asteraceae	Antennaria corymbosa E.E. Nelson	native
Asteraceae	Antennaria dimorpha (Nutt.) Torr. & A. Gray	native
Asteraceae	Antennaria media Greene	native
Asteraceae	Antennaria pulchella Greene	native
Asteraceae	Antennaria rosea Greene	native
Asteraceae	Antennaria umbrinella Rydb.	native
Asteraceae	Anthemis cotula L.	non-native
Asteraceae	Arnica amplexicaulis Nutt.	native
Asteraceae	Arnica chamissonis Less. ssp. foliosa (Nutt.) Maguire	native
Asteraceae	Arnica cordifolia Hook.	native
Asteraceae	Arnica latifolia Bong.	native
Asteraceae	Arnica longifolia D.C. Eaton	native
Asteraceae	Arnica mollis Hook.	native
Asteraceae	Arnica nevadensis A. Gray	native
Asteraceae	Arnica parryi A. Gray	native
Asteraceae	Artemisia douglasiana Besser	native
Asteraceae	Artemisia dracunculus L.	native
Asteraceae	Artemisia ludoviciana Nutt. ssp. albula (Wooton) D.D. Keck	native
Asteraceae	Artemisia ludoviciana Nutt. ssp. incompta (Nutt.) D.D. Keck	native
Asteraceae	Artemisia norvegica Fr. ssp. saxatilis (Besser) H.M. Hall & Clem.	native
Asteraceae	Artemisia rothrockii A. Gray	native
Asteraceae	Artemisia tridentata Nutt. ssp. vaseyana (Rydb.) Beetle	native
Asteraceae	Aster alpigenus (Torr. & A. Gray) A. Gray var. andersonii (A. Gray) M. Peck	native
Asteraceae	Aster ascendens Lindl.	native
Asteraceae	Aster breweri (A. Gray) Semple	native
Asteraceae	Aster eatonii (A. Gray) Howell	native
Asteraceae	Aster integrifolius Nutt.	native
Asteraceae	Aster occidentalis (Nutt.) Torr. & A. Gray var. occidentalis	native
Asteraceae	Aster occidentalis (Nutt.) Torr. & A. Gray var. yosemitanus (A. Gray) Cronquist	native
Asteraceae	Aster peirsonii Sharsm.	native
Asteraceae	Baccharis douglasii DC.	native
Asteraceae	Baccharis salicifolia (Ruiz & Pav.) Pers.	native
Asteraceae	Balsamorhiza deltoidea Nutt.	native
Asteraceae	Balsamorhiza sagittata (Pursh) Nutt.	native
Asteraceae	Bellis perennis L.	non-native

Asteraceae	Brickellia californica (Torr. & A. Gray) A. Gray	native
Asteraceae	Brickellia grandiflora (Hook.) Nutt.	native
Asteraceae	Carduus pycnocephalus L.	non-native
Asteraceae	Centaurea melitensis L.	non-native
Asteraceae	Chaenactis alpigena Sharsm.	native
Asteraceae	Chaenactis douglasii (Hook.) Hook. & Arn. var. douglasii	native
Asteraceae	Chaenactis glabriuscula DC. var. megacephala A. Gray	native
Asteraceae	Chamomilla suaveolens (Pursh) Rydb.	non-native
Asteraceae	Chrysothamnus nauseosus (Pall.) Britton ssp. albicaulis (Nutt.) H.M. Hall & Clem.	native
Asteraceae	Chrysothamnus parryi (A. Gray) Greene ssp. vulcanicus (Greene) H.M. Hall & Clem.	native
Asteraceae	Chrysothamnus viscidiflorus (Hook.) Nutt. ssp. viscidiflorus	native
Asteraceae	Cirsium andersonii (A. Gray) Jeps.	native
Asteraceae	Cirsium arizonicum (A. Gray) Petr.	native
Asteraceae	Cirsium arizonicum (A. Gray) Petr. var. arizonicum	native
Asteraceae	Cirsium occidentale (Nutt.) Jeps. var. californicum (A. Gray) D.J. Keil & C.E. Turner	native
Asteraceae	Cirsium occidentale (Nutt.) Jeps. var. venustum (Greene) Jeps.	native
Asteraceae	Cirsium scariosum Nutt.	native
Asteraceae	Cirsium vulgare (Savi) Ten.	non-native
Asteraceae	Conyza canadensis (L.) Cronquist	native
Asteraceae	Coreopsis bigelovii (A. Gray) H.M. Hall	native
Asteraceae	Coreopsis stillmanii (A. Gray) S.F. Blake	native
Asteraceae	Cotula australis (Sieber) Hook. f.	non-native
Asteraceae	Crepis acuminata Nutt.	native
Asteraceae	Crepis intermedia A. Gray	native
Asteraceae	Crepis nana A. Richards	native
Asteraceae	Dugaldia hoopesii (A. Gray) Rydb.	native
Asteraceae	Ericameria arborescens (A. Gray) Greene	native
Asteraceae	Ericameria bloomeri (A. Gray) J.F. Macbr.	native
Asteraceae	Ericameria cuneata (A. Gray) McClatchie	native
Asteraceae	Ericameria discoidea (Nutt.) G.L. Nesom	native
Asteraceae	Ericameria suffruticosa (Nutt.) G.L. Nesom	native
Asteraceae	Erigeron aequifolius H.M. Hall	native
Asteraceae	Erigeron algidus Jeps.	native
Asteraceae	Erigeron breweri A. Gray var. breweri	native
Asteraceae	Erigeron breweri A. Gray var. covillei (Greene) G.L. Nesom	native
Asteraceae	Erigeron clokeyi Cronquist	native
Asteraceae	Erigeron compositus Pursh	native

Asteraceae	<i>Erigeron coulteri</i> Porter	native
Asteraceae	<i>Erigeron divergens</i> Torr. & A. Gray	native
Asteraceae	<i>Erigeron elmeri</i> (Greene) Greene	native
Asteraceae	<i>Erigeron foliosus</i> Nutt. var. <i>foliosus</i>	native
Asteraceae	<i>Erigeron inornatus</i> A. Gray var. <i>keilii</i> G.L. Nesom	native
Asteraceae	<i>Erigeron multiceps</i> Greene	native
Asteraceae	<i>Erigeron peregrinus</i> (Pursh) Greene var. <i>callianthemus</i> (Greene) Cronquist	native
Asteraceae	<i>Erigeron peregrinus</i> (Pursh) Greene var. <i>hirsutus</i> Cronquist	native
Asteraceae	<i>Erigeron pygmaeus</i> (A. Gray) Greene	native
Asteraceae	<i>Erigeron vagus</i> Payson	native
Asteraceae	<i>Eriophyllum confertiflorum</i> (DC.) A. Gray var. <i>confertiflorum</i>	native
Asteraceae	<i>Eriophyllum lanatum</i> (Pursh) J. Forbes var. <i>croceum</i> (Greene) Jeps.	native
Asteraceae	<i>Eriophyllum lanatum</i> (Pursh) J. Forbes var. <i>integrifolium</i> (Hook.) F.J. Smiley	native
Asteraceae	<i>Eriophyllum lanatum</i> (Pursh) J. Forbes var. <i>obovatum</i> (Greene) H.M. Hall	native
Asteraceae	<i>Euthamia occidentalis</i> Nutt.	native
Asteraceae	<i>Filago californica</i> Nutt.	native
Asteraceae	<i>Filago gallica</i> L.	non-native
Asteraceae	<i>Gnaphalium bicolor</i> Bioletti	native
Asteraceae	<i>Gnaphalium californicum</i> DC.	native
Asteraceae	<i>Gnaphalium canescens</i> DC. ssp. <i>beneolens</i> (Davidson) Stebb. & D.J. Keil	native
Asteraceae	<i>Gnaphalium canescens</i> DC. ssp. <i>microcephalum</i> (Nutt.) Stebb. & D.J. Keil	native
Asteraceae	<i>Gnaphalium luteo-album</i> L.	non-native
Asteraceae	<i>Gnaphalium palustre</i> Nutt.	native
Asteraceae	<i>Gnaphalium stramineum</i> Kunth	native
Asteraceae	<i>Hazardia whitneyi</i> (A. Gray) Greene var. <i>whitneyi</i>	native
Asteraceae	<i>Hedypnois cretica</i> (L.) Dum.Cours.	non-native
Asteraceae	<i>Helenium bigelovii</i> A. Gray	native
Asteraceae	<i>Helianthus annuus</i> L.	native
Asteraceae	<i>Hemizonia kelloggii</i> Greene	native
Asteraceae	<i>Hemizonia pungens</i> (Hook. & Arn.) Torr. & A. Gray ssp. <i>pungens</i>	native
Asteraceae	<i>Hesperevax acaulis</i> (Kellogg) Greene	native
Asteraceae	<i>Heterotheca grandiflora</i> Nutt.	native
Asteraceae	<i>Hieracium albiflorum</i> Hook.	native
Asteraceae	<i>Hieracium gracile</i> Hook.	native
Asteraceae	<i>Hieracium gracile</i> Hook. var. <i>detonsum</i> (A. Gray) A. Gray	native
Asteraceae	<i>Hieracium horridum</i> Fr.	native

Asteraceae	Hieracium scouleri Hook.	native
Asteraceae	Holocarpha heermannii (Greene) D.D. Keck	native
Asteraceae	Hulsea algida A. Gray	native
Asteraceae	Hulsea brevifolia A. Gray	native
Asteraceae	Hulsea heterochroma A. Gray	native
Asteraceae	Hulsea vestita A. Gray ssp. pygmaea (A. Gray) Wilken	native
Asteraceae	Hulsea vestita A. Gray ssp. vestita	native
Asteraceae	Hypochaeris glabra L.	non-native
Asteraceae	Lactuca serriola L.	non-native
Asteraceae	Lasthenia californica Lindl.	native
Asteraceae	Layia glandulosa (Hook.) Hook. & Arn.	native
Asteraceae	Layia pentachaeta A. Gray ssp. pentachaeta	native
Asteraceae	Lessingia filaginifolia (Hook. & Arn.) M.A. Lane var. filaginifolia	native
Asteraceae	Lessingia leptoclada A. Gray	native
Asteraceae	Madia bolanderi (A. Gray) A. Gray	native
Asteraceae	Madia elegans Lindl. ssp. elegans	native
Asteraceae	Madia elegans Lindl. ssp. vernalis D.D. Keck	native
Asteraceae	Madia elegans Lindl. ssp. wheeleri (A. Gray) D.D. Keck	native
Asteraceae	Madia exigua (Sm.) A. Gray	native
Asteraceae	Madia glomerata Hook.	native
Asteraceae	Madia gracilis (Sm.) D. D. Keck & J. C. Clausen ex Applegate	native
Asteraceae	Madia minima (A. Gray) D.D. Keck	native
Asteraceae	Madia yosemitana A. Gray	native
Asteraceae	Malacothrix clevelandii A. Gray	native
Asteraceae	Micropus californicus Fisch. & C.A. Mey.	native
Asteraceae	Microseris nutans (Hook.) Sch.Bip.	native
Asteraceae	Nothocalais alpestris (A. Gray) K.L. Chambers	native
Asteraceae	Orochaenactis thysanocarpa (A. Gray) Coville	native
Asteraceae	Phalacroseris bolanderi A. Gray	native
Asteraceae	Pseudobahia heermannii (Durand) Rydb.	native
Asteraceae	Psilocarphus brevissimus Nutt. var. brevissimus	native
Asteraceae	Pyrrocoma apargioides (A. Gray) Greene	native
Asteraceae	Rafinesquia californica Nutt.	native
Asteraceae	Raillardella argentea (A. Gray) A. Gray	native
Asteraceae	Raillardella scaposa (A. Gray) A. Gray	native
Asteraceae	Raillardiosis muirii (A. Gray) Rydb.	native
Asteraceae	Rigiopappus leptocladus A. Gray	native
Asteraceae	Rudbeckia californica A. Gray var. californica	native
Asteraceae	Senecio aronicoides DC.	native
Asteraceae	Senecio canus Hook.	native

Asteraceae	<i>Senecio clarkianus</i> A. Gray	native
Asteraceae	<i>Senecio flaccidus</i> Less. var. <i>douglasii</i> (DC.) B.L. Turner & T. Barkley	native
Asteraceae	<i>Senecio fremontii</i> Torr. & A. Gray var. <i>fremontii</i>	native
Asteraceae	<i>Senecio fremontii</i> Torr. & A. Gray var. <i>occidentalis</i> A. Gray	native
Asteraceae	<i>Senecio indecorus</i> Greene	native
Asteraceae	<i>Senecio integerrimus</i> Nutt. var. <i>exaltatus</i> (Nutt.) Cronquist	native
Asteraceae	<i>Senecio integerrimus</i> Nutt. var. <i>major</i> (A. Gray) Cronquist	native
Asteraceae	<i>Senecio pauciflorus</i> Pursh	native
Asteraceae	<i>Senecio pseud aureus</i> Rydb. var. <i>pseud aureus</i>	native
Asteraceae	<i>Senecio scorzonella</i> Greene	native
Asteraceae	<i>Senecio serra</i> Hook. var. <i>serra</i>	native
Asteraceae	<i>Senecio streptanthifolius</i> Greene	native
Asteraceae	<i>Senecio triangularis</i> Hook.	native
Asteraceae	<i>Senecio vulgaris</i> L.	non-native
Asteraceae	<i>Senecio wernerii</i> folius A. Gray	native
Asteraceae	<i>Silybum marianum</i> (L.) Gaertn.	non-native
Asteraceae	<i>Solidago californica</i> Nutt.	native
Asteraceae	<i>Solidago canadensis</i> L. ssp. <i>elongata</i> (Nutt.) D.D. Keck	native
Asteraceae	<i>Solidago multiradiata</i> Aiton	native
Asteraceae	<i>Soliva sessilis</i> Ruiz & Pav.	non-native
Asteraceae	<i>Sonchus asper</i> (L.) Hill ssp. <i>asper</i>	non-native
Asteraceae	<i>Sonchus oleraceus</i> L.	non-native
Asteraceae	<i>Sonchus tenerrimus</i> L.	non-native
Asteraceae	<i>Sphaeromeria cana</i> (D.C. Eaton) A. Heller	native
Asteraceae	<i>Stephanomeria tenuifolia</i> (Torr.) H.M. Hall	native
Asteraceae	<i>Stephanomeria virgata</i> Benth. ssp. <i>pleurocarpa</i> (Greene) Gottlieb	native
Asteraceae	<i>Stylocline gnaphaloides</i> Nutt.	native
Asteraceae	<i>Taraxacum officinale</i> Wigg.	non-native
Asteraceae	<i>Tetradymia canescens</i> DC.	native
Asteraceae	<i>Tonestus peirsonii</i> (D.D. Keck) G.L. Nesom & D.R. Morgan	native
Asteraceae	<i>Tragopogon dubius</i> Scop.	non-native
Asteraceae	<i>Trimorpha lonchophylla</i> (Hook.) G.L. Nesom	native
Asteraceae	<i>Uropappus lindleyi</i> (DC.) Nutt.	native
Asteraceae	<i>Wyethia angustifolia</i> (DC.) Nutt.	native
Asteraceae	<i>Wyethia invenusta</i> (Greene) W.A. Weber	native
Asteraceae	<i>Xanthium strumarium</i> L.	native
Azollaceae	<i>Azolla filiculoides</i> Lam.	native
Berberidaceae	<i>Berberis aquifolium</i> Pursh var. <i>dictyota</i> (Jeps.) Jeps.	native
Betulaceae	<i>Alnus incana</i> (L.) Moench ssp. <i>tenuifolia</i> (Nutt.) Breitung	native
Betulaceae	<i>Alnus rhombifolia</i> Nutt.	native

Betulaceae	<i>Betula occidentalis</i> Hook.	native
Betulaceae	<i>Corylus cornuta</i> Marshall var. <i>californica</i> (A. DC.) W. Sharp	native
Blechnaceae	<i>Woodwardia fimbriata</i> Sm.	native
Boraginaceae	<i>Amsinckia eastwoodiae</i> J.F. Macbr.	native
Boraginaceae	<i>Amsinckia menziesii</i> (Lehm.) Nelson & J.F. Macbr. var. <i>intermedia</i> (Fisch. & C.A. Mey.) Ganders	native
Boraginaceae	<i>Amsinckia menziesii</i> (Lehm.) Nelson & J.F. Macbr. var. <i>menziesii</i>	native
Boraginaceae	<i>Cryptantha affinis</i> (A. Gray) Greene	native
Boraginaceae	<i>Cryptantha ambigua</i> (A. Gray) Greene	native
Boraginaceae	<i>Cryptantha circumscissa</i> (Hook. & Arn.) I.M. Johnst.	native
Boraginaceae	<i>Cryptantha echinella</i> Greene	native
Boraginaceae	<i>Cryptantha flaccida</i> (Lehm.) Greene	native
Boraginaceae	<i>Cryptantha glomeriflora</i> Greene	native
Boraginaceae	<i>Cryptantha humilis</i> (Greene) Payson	native
Boraginaceae	<i>Cryptantha intermedia</i> (A. Gray) Greene	native
Boraginaceae	<i>Cryptantha micromeres</i> (A. Gray) Greene	native
Boraginaceae	<i>Cryptantha muricata</i> (Hook. & Arn.) Nelson & J.F. Macbr.	native
Boraginaceae	<i>Cryptantha nubigena</i> (Greene) Payson	native
Boraginaceae	<i>Cryptantha simulans</i> Greene	native
Boraginaceae	<i>Cryptantha torreyana</i> (A. Gray) Greene	native
Boraginaceae	<i>Cynoglossum grande</i> Lehm.	native
Boraginaceae	<i>Cynoglossum occidentale</i> A. Gray	native
Boraginaceae	<i>Hackelia floribunda</i> (Lehm.) I.M. Johnst.	native
Boraginaceae	<i>Hackelia micrantha</i> (Eastw.) J.L. Gentry	native
Boraginaceae	<i>Hackelia mundula</i> (Jeps.) Ferris	native
Boraginaceae	<i>Hackelia sharsmithii</i> I.M. Johnst.	native
Boraginaceae	<i>Hackelia velutina</i> (Piper) I.M. Johnst.	native
Boraginaceae	<i>Heliotropium curassavicum</i> L.	native
Boraginaceae	<i>Mertensia ciliata</i> (Torr.) G. Don	native
Boraginaceae	<i>Pectocarya penicillata</i> (Hook. & Arn.) A. DC.	native
Boraginaceae	<i>Pectocarya pusilla</i> (A. DC.) A. Gray	native
Boraginaceae	<i>Plagiobothrys acanthocarpus</i> (Piper) I.M. Johnst.	native
Boraginaceae	<i>Plagiobothrys hispidulus</i> (Greene) I.M. Johnst.	native
Boraginaceae	<i>Plagiobothrys nothofulvus</i> (A. Gray) A. Gray	native
Boraginaceae	<i>Plagiobothrys tenellus</i> (Nutt.) A. Gray	native
Boraginaceae	<i>Plagiobothrys torreyi</i> (A. Gray) A. Gray var. <i>diffusus</i> I.M. Johnst.	native
Boraginaceae	<i>Plagiobothrys torreyi</i> (A. Gray) A. Gray var. <i>torreyi</i>	native
Boraginaceae	<i>Plagiobothrys trachycarpus</i> (A. Gray) I.M. Johnst.	native
Brassicaceae	<i>Anelsonia eurycarpa</i> (A. Gray) J.F. Macbr. & Payson	native
Brassicaceae	<i>Arabis bodiensis</i> Rollins	native

Brassicaceae	<i>Arabis davidsonii</i> Greene	native
Brassicaceae	<i>Arabis drummondii</i> A. Gray	native
Brassicaceae	<i>Arabis glabra</i> (L.) Benth. var. <i>glabra</i>	native
Brassicaceae	<i>Arabis hirsuta</i> (L.) Scop. var. <i>glabrata</i> Torr. & A. Gray	native
Brassicaceae	<i>Arabis holboellii</i> Hornem. var. <i>pendulocarpa</i> (Nelson) Rollins	native
Brassicaceae	<i>Arabis holboellii</i> Hornem. var. <i>pinetorum</i> (Tidestrom) Rollins	native
Brassicaceae	<i>Arabis holboellii</i> Hornem. var. <i>retrofracta</i> (Graham) Rydb.	native
Brassicaceae	<i>Arabis inyoensis</i> Rollins	native
Brassicaceae	<i>Arabis lemmonii</i> S. Watson var. <i>depauperata</i> (A. Nelson & P.B. Kenn.) Rollins	native
Brassicaceae	<i>Arabis lemmonii</i> S. Watson var. <i>lemmonii</i>	native
Brassicaceae	<i>Arabis lyallii</i> S. Watson var. <i>lyallii</i>	native
Brassicaceae	<i>Arabis lyallii</i> S. Watson var. <i>nubigena</i> (J.F. Macbr. & Payson) Rollins	native
Brassicaceae	<i>Arabis microphylla</i> Nutt. var. <i>microphylla</i>	native
Brassicaceae	<i>Arabis platysperma</i> A. Gray var. <i>howellii</i> (S. Watson) Jeps.	native
Brassicaceae	<i>Arabis platysperma</i> A. Gray var. <i>platysperma</i>	native
Brassicaceae	<i>Arabis pygmaea</i> Rollins	native
Brassicaceae	<i>Arabis rectissima</i> Greene var. <i>rectissima</i>	native
Brassicaceae	<i>Arabis repanda</i> S. Watson var. <i>greenei</i> Jeps.	native
Brassicaceae	<i>Arabis repanda</i> S. Watson var. <i>repanda</i>	native
Brassicaceae	<i>Arabis sparsiflora</i> Torr. & A. Gray var. <i>arcuata</i> (Nutt.) Rollins	native
Brassicaceae	<i>Arabis sparsiflora</i> Torr. & A. Gray var. <i>subvillosa</i> (S. Watson) Rollins	native
Brassicaceae	<i>Arabis x divaricarpa</i> Nelson	native
Brassicaceae	<i>Athysanus pusillus</i> (Hook.) Greene	native
Brassicaceae	<i>Barbarea orthoceras</i> Ledeb.	native
Brassicaceae	<i>Barbarea verna</i> (Mill.) Asch.	non-native
Brassicaceae	<i>Brassica nigra</i> (L.) Koch	non-native
Brassicaceae	<i>Capsella bursa-pastoris</i> (L.) Medik.	non-native
Brassicaceae	<i>Cardamine breweri</i> S. Watson var. <i>breweri</i>	native
Brassicaceae	<i>Cardamine californica</i> (Nutt.) Greene	native
Brassicaceae	<i>Cardamine oligosperma</i> Nutt.	native
Brassicaceae	<i>Cardamine pachystigma</i> (S. Watson) Rollins	native
Brassicaceae	<i>Caulanthus coulteri</i> S. Watson var. <i>coulteri</i>	native
Brassicaceae	<i>Coronopus didymus</i> (L.) Sm.	non-native
Brassicaceae	<i>Descurainia californica</i> (A. Gray) O.E. Schulz	native
Brassicaceae	<i>Descurainia incana</i> (Fisch. & C.A. Mey.) Dorn	native
Brassicaceae	<i>Descurainia incisa</i> (A. Gray) Britton ssp. <i>incisa</i>	native
Brassicaceae	<i>Descurainia sophia</i> (L.) Webb	non-native
Brassicaceae	<i>Draba albertina</i> Greene	native
Brassicaceae	<i>Draba breweri</i> S. Watson	native

Brassicaceae	<i>Draba cruciata</i> Payson	native
Brassicaceae	<i>Draba cuneifolia</i> Torr. & A. Gray	native
Brassicaceae	<i>Draba densifolia</i> Nutt.	native
Brassicaceae	<i>Draba lemmonii</i> S. Watson var. <i>lemmonii</i>	native
Brassicaceae	<i>Draba monoensis</i> Rollins & R.A. Price	native
Brassicaceae	<i>Draba oligosperma</i> Hook. var. <i>oligosperma</i>	native
Brassicaceae	<i>Draba praealta</i> Greene	native
Brassicaceae	<i>Draba sharsmithii</i> Rollins & R.A. Price	native
Brassicaceae	<i>Draba verna</i> L. var. <i>verna</i>	native
Brassicaceae	<i>Erysimum capitatum</i> (Hook.) Greene var. <i>capitatum</i>	native
Brassicaceae	<i>Erysimum capitatum</i> (Hook.) Greene var. <i>perenne</i> (Coville) R.J. Davis	native
Brassicaceae	<i>Guillenia lasiophylla</i> (Hook. & Arn.) Greene	native
Brassicaceae	<i>Hirschfeldia incana</i> (L.) Lagr.-Fossat	non-native
Brassicaceae	<i>Lepidium dictyotum</i> A. Gray var. <i>dictyotum</i>	native
Brassicaceae	<i>Lepidium nitidum</i> Torr. & A. Gray var. <i>nitidum</i>	native
Brassicaceae	<i>Lepidium oblongum</i> Small	native
Brassicaceae	<i>Lepidium virginicum</i> L. var. <i>pubescens</i> (Greene) Thell.	native
Brassicaceae	<i>Raphanus raphanistrum</i> L.	non-native
Brassicaceae	<i>Raphanus sativus</i> L.	non-native
Brassicaceae	<i>Rorippa curvipes</i> Greene var. <i>truncata</i> (Jeps.) Rollins	native
Brassicaceae	<i>Rorippa curvisiliqua</i> (Hook.) Britton	native
Brassicaceae	<i>Rorippa nasturtium-aquaticum</i> (L.) Hayek	native
Brassicaceae	<i>Sisymbrium altissimum</i> L.	non-native
Brassicaceae	<i>Sisymbrium irio</i> L.	non-native
Brassicaceae	<i>Sisymbrium officinale</i> L.	non-native
Brassicaceae	<i>Sisymbrium orientale</i> L.	non-native
Brassicaceae	<i>Streptanthus diversifolius</i> S. Watson	native
Brassicaceae	<i>Streptanthus farnsworthianus</i> J.T. Howell	native
Brassicaceae	<i>Streptanthus fenestratus</i> (Greene) J.T. Howell	native
Brassicaceae	<i>Streptanthus gracilis</i> Eastw.	native
Brassicaceae	<i>Streptanthus tortuosus</i> Kellogg var. <i>orbiculatus</i> (Greene) H.M. Hall	native
Brassicaceae	<i>Streptanthus tortuosus</i> Kellogg var. <i>tortuosus</i>	native
Brassicaceae	<i>Thysanocarpus curvipes</i> Hook.	native
Brassicaceae	<i>Tropidocarpum gracile</i> Hook.	native
Callitrichaceae	<i>Callitriche hermaphroditica</i> L.	native
Callitrichaceae	<i>Callitriche verna</i> L.	native
Calycanthaceae	<i>Calycanthus occidentalis</i> Hook. & Arn.	native
Campanulaceae	<i>Campanula prenanthoides</i> Durand	native
Campanulaceae	<i>Githopsis specularioides</i> Nutt.	native
Campanulaceae	<i>Heterocodon rariflorum</i> Nutt.	native

Campanulaceae	<i>Nemacladus capillaris</i> Greene	native
Campanulaceae	<i>Nemacladus interior</i> (Munz) G.T. Robbins	native
Campanulaceae	<i>Porterella carnosula</i> (Hook. & Arn.) Torr.	native
Campanulaceae	<i>Triodanis biflora</i> (Ruiz & Pav.) Greene	native
Cannabaceae	<i>Cannabis sativa</i> L.	non-native
Caprifoliaceae	<i>Lonicera cauriana</i> Fernald	native
Caprifoliaceae	<i>Lonicera conjugialis</i> Kellogg	native
Caprifoliaceae	<i>Lonicera hispidula</i> Douglas var. <i>vacillans</i> A. Gray	native
Caprifoliaceae	<i>Lonicera interrupta</i> Benth.	native
Caprifoliaceae	<i>Lonicera involucrata</i> (Richardson) Banks var. <i>involucrata</i>	native
Caprifoliaceae	<i>Sambucus melanocarpa</i> A. Gray	native
Caprifoliaceae	<i>Sambucus mexicana</i> C. Presl ex DC.	native
Caprifoliaceae	<i>Sambucus racemosa</i> L. var. <i>microbotrys</i> (Rydb.) Kearney & Peebles	native
Caprifoliaceae	<i>Symphoricarpos mollis</i> Nutt.	native
Caprifoliaceae	<i>Symphoricarpos rotundifolius</i> A. Gray var. <i>parishii</i> (Rydb.) Dempster	native
Caprifoliaceae	<i>Symphoricarpos rotundifolius</i> A. Gray var. <i>rotundifolius</i>	native
Caryophyllaceae	<i>Arenaria congesta</i> Nutt. var. <i>suffrutescens</i> (A. Gray) B.L. Rob.	native
Caryophyllaceae	<i>Arenaria kingii</i> (S. Watson) M.E. Jones var. <i>glabrescens</i> (S. Watson) Maguire	native
Caryophyllaceae	<i>Arenaria serpyllifolia</i> L. ssp. <i>serpyllifolia</i>	non-native
Caryophyllaceae	<i>Cerastium fontanum</i> Baumg. ssp. <i>vulgare</i> (Hartm.) Greuter & Burdet	non-native
Caryophyllaceae	<i>Cerastium glomeratum</i> Thuill.	non-native
Caryophyllaceae	<i>Herniaria hirsuta</i> L. ssp. <i>cinerea</i> (DC.) Cout.	non-native
Caryophyllaceae	<i>Minuartia californica</i> (A. Gray) Mattf.	native
Caryophyllaceae	<i>Minuartia douglasii</i> (Torr. & A. Gray) Mattf.	native
Caryophyllaceae	<i>Minuartia nuttallii</i> (Pax) Briq. ssp. <i>gracilis</i> (B.L. Rob.) McNeill	native
Caryophyllaceae	<i>Minuartia rubella</i> (Wahlenb.) Hiern	native
Caryophyllaceae	<i>Minuartia stricta</i> (Sw.) Hiern	native
Caryophyllaceae	<i>Moehringia macrophylla</i> (Hook.) Fenzl	native
Caryophyllaceae	<i>Petrorhagia dubia</i> (Raf.) G. Lopez & Romo	non-native
Caryophyllaceae	<i>Polycarpon tetraphyllum</i> (L.) L.	non-native
Caryophyllaceae	<i>Pseudostellaria jamesiana</i> (Torr.) W.A. Weber & R.L. Hartm.	native
Caryophyllaceae	<i>Sagina apetala</i> Ard.	native
Caryophyllaceae	<i>Sagina decumbens</i> (Elliott) Torr. & A. Gray ssp. <i>occidentalis</i> (S. Watson) G. Crow	native
Caryophyllaceae	<i>Sagina saginoides</i> (L.) H. Karst.	native
Caryophyllaceae	<i>Scleranthus annuus</i> L. ssp. <i>annuus</i>	non-native
Caryophyllaceae	<i>Silene antirrhina</i> L.	native
Caryophyllaceae	<i>Silene aperta</i> Greene	native
Caryophyllaceae	<i>Silene bernardina</i> S. Watson	native

Caryophyllaceae	<i>Silene bridgesii</i> Rohrb.	native
Caryophyllaceae	<i>Silene californica</i> Durand	native
Caryophyllaceae	<i>Silene gallica</i> L.	non-native
Caryophyllaceae	<i>Silene lemmonii</i> S. Watson	native
Caryophyllaceae	<i>Silene menziesii</i> Hook.	native
Caryophyllaceae	<i>Silene occidentalis</i> S. Watson ssp. <i>occidentalis</i>	native
Caryophyllaceae	<i>Silene sargentii</i> S. Watson	native
Caryophyllaceae	<i>Silene verecunda</i> S. Watson ssp. <i>platyota</i> (S. Watson) C.L. Hitchc. & Maguire	native
Caryophyllaceae	<i>Spergularia bocconeii</i> (Scheele) Merino	non-native
Caryophyllaceae	<i>Spergularia rubra</i> (L.) J. Presl & C. Presl	non-native
Caryophyllaceae	<i>Stellaria borealis</i> Bigelow ssp. <i>sitchana</i> (Steudel) Piper	native
Caryophyllaceae	<i>Stellaria calycantha</i> (Ledeb.) Bong.	native
Caryophyllaceae	<i>Stellaria crispa</i> Cham. & Schldl.	native
Caryophyllaceae	<i>Stellaria longipes</i> Goldie var. <i>longipes</i>	native
Caryophyllaceae	<i>Stellaria media</i> (L.) Villars	non-native
Caryophyllaceae	<i>Stellaria nitens</i> Nutt.	native
Caryophyllaceae	<i>Stellaria umbellata</i> Karelín & Kir.	native
Chenopodiaceae	<i>Chenopodium album</i> L.	non-native
Chenopodiaceae	<i>Chenopodium atrovirens</i> Rydb.	native
Chenopodiaceae	<i>Chenopodium botrys</i> L.	non-native
Chenopodiaceae	<i>Chenopodium californicum</i> (S. Watson) S. Watson	native
Chenopodiaceae	<i>Chenopodium fremontii</i> S. Watson	native
Chenopodiaceae	<i>Chenopodium leptophyllum</i> Moq.	native
Chenopodiaceae	<i>Chenopodium pratericola</i> Rydb.	native
Chenopodiaceae	<i>Monolepis nuttalliana</i> (Schult.) Greene	native
Convolvulaceae	<i>Calystegia malacophylla</i> (Greene) Munz ssp. <i>malacophylla</i>	native
Convolvulaceae	<i>Calystegia occidentalis</i> (A. Gray) Brummitt ssp. <i>fulcrata</i> (A. Gray) Brummitt	native
Convolvulaceae	<i>Calystegia occidentalis</i> (A. Gray) Brummitt ssp. <i>occidentalis</i>	native
Convolvulaceae	<i>Convolvulus arvensis</i> L.	non-native
Cornaceae	<i>Cornus glabrata</i> Benth.	native
Cornaceae	<i>Cornus nuttallii</i> Audubon	native
Cornaceae	<i>Cornus sericea</i> L. ssp. <i>occidentalis</i> (Torr. & A. Gray) Fosb.	native
Cornaceae	<i>Cornus sericea</i> L. ssp. <i>sericea</i>	native
Crassulaceae	<i>Crassula connata</i> (Ruiz & Pav.) A. Berger	native
Crassulaceae	<i>Crassula tillaea</i> Lest.-Garl.	non-native
Crassulaceae	<i>Dudleya cymosa</i> (Lemaire) Britton & Rose	native
Crassulaceae	<i>Parvisedum congdonii</i> (Eastw.) R.T. Clausen	native
Crassulaceae	<i>Sedum lanceolatum</i> Torr.	native

Crassulaceae	<i>Sedum obtusatum</i> A. Gray ssp. <i>obtusatum</i>	native
Crassulaceae	<i>Sedum radiatum</i> S. Watson	native
Crassulaceae	<i>Sedum roseum</i> (L.) Scop. ssp. <i>integrifolium</i> (Raf.) Hultén	native
Crassulaceae	<i>Sedum stenopetalum</i> Pursh	native
Cucurbitaceae	<i>Marah horridus</i> (Congdon) Dunn	native
Cupressaceae	<i>Calocedrus decurrens</i> (Torr.) Florin	native
Cupressaceae	<i>Juniperus occidentalis</i> Hook. var. <i>australis</i> (Vasek) A.H. Holmgren & N.H. Holmgren	native
Cuscutaceae	<i>Cuscuta californica</i> Hook. & Arn. var. <i>breviflora</i> Engelm.	native
Cuscutaceae	<i>Cuscuta californica</i> Hook. & Arn. var. <i>californica</i>	native
Cuscutaceae	<i>Cuscuta subinclusa</i> Durand & Hilg.	native
Cyperaceae	<i>Carex abrupta</i> Mack.	native
Cyperaceae	<i>Carex albonigra</i> Mack.	native
Cyperaceae	<i>Carex amplifolia</i> Boott	native
Cyperaceae	<i>Carex angustata</i> Boott	native
Cyperaceae	<i>Carex aquatilis</i> Wahlenb. var. <i>aquatilis</i>	native
Cyperaceae	<i>Carex athrostachya</i> Olney	native
Cyperaceae	<i>Carex aurea</i> Nutt.	native
Cyperaceae	<i>Carex bolanderi</i> Olney	native
Cyperaceae	<i>Carex breweri</i> Boott var. <i>breweri</i>	native
Cyperaceae	<i>Carex canescens</i> L.	native
Cyperaceae	<i>Carex capitata</i> L.	native
Cyperaceae	<i>Carex congdonii</i> L.H. Bailey	native
Cyperaceae	<i>Carex deweyana</i> Schwein. ssp. <i>leptopoda</i> (Mack.) Calder & Roy L. Taylor	native
Cyperaceae	<i>Carex disperma</i> Dewey	native
Cyperaceae	<i>Carex douglasii</i> Boott	native
Cyperaceae	<i>Carex echinata</i> Murray ssp. <i>echinata</i>	native
Cyperaceae	<i>Carex feta</i> L.H. Bailey	native
Cyperaceae	<i>Carex filifolia</i> Nutt. var. <i>erostrata</i> Kük.	native
Cyperaceae	<i>Carex filifolia</i> Nutt. var. <i>filifolia</i>	native
Cyperaceae	<i>Carex fissuricola</i> Mack.	native
Cyperaceae	<i>Carex fracta</i> Mack.	native
Cyperaceae	<i>Carex geyeri</i> Boott	native
Cyperaceae	<i>Carex haydeniana</i> Olney	native
Cyperaceae	<i>Carex helleri</i> Mack.	native
Cyperaceae	<i>Carex heteroneura</i> W. Boott var. <i>epapillosa</i> (Mack.) F. Herm.	native
Cyperaceae	<i>Carex heteroneura</i> W. Boott var. <i>heteroneura</i>	native
Cyperaceae	<i>Carex hoodii</i> Boott	native
Cyperaceae	<i>Carex illota</i> L.H. Bailey	native

Cyperaceae	Carex incurviformis Mack. var. danaensis (Stacey) F. Herm.	native
Cyperaceae	Carex integra Mack.	native
Cyperaceae	Carex jonesii L.H. Bailey	native
Cyperaceae	Carex lanuginosa Michx.	native
Cyperaceae	Carex lemmonii W. Boott	native
Cyperaceae	Carex lenticularis Michx. var. impressa (L.H. Bailey) L. Standley	native
Cyperaceae	Carex lenticularis Michx. var. lipocarpa (Holm) L. Standley	native
Cyperaceae	Carex leporinella Mack.	native
Cyperaceae	Carex luzulina Olney var. luzulina	native
Cyperaceae	Carex mariposana L.H. Bailey	native
Cyperaceae	Carex microptera Mack.	native
Cyperaceae	Carex multicaulis L.H. Bailey	native
Cyperaceae	Carex multicostata Mack.	native
Cyperaceae	Carex nebrascensis Dewey	native
Cyperaceae	Carex nervina L.H. Bailey	native
Cyperaceae	Carex nigricans C.A. Mey.	native
Cyperaceae	Carex pachystachya Cham.	native
Cyperaceae	Carex phaeocephala Piper	native
Cyperaceae	Carex praeceptorum Mack.	native
Cyperaceae	Carex praticola Rydb.	native
Cyperaceae	Carex preslii Steudel	native
Cyperaceae	Carex proposita Mack.	native
Cyperaceae	Carex raynoldsii Dewey	native
Cyperaceae	Carex rossii Boott	native
Cyperaceae	Carex scopulorum Holm var. bracteosa (L.H. Bailey) F. Herm.	native
Cyperaceae	Carex simulata Mack.	native
Cyperaceae	Carex specifica L.H. Bailey	native
Cyperaceae	Carex spectabilis Dewey	native
Cyperaceae	Carex straminiformis L.H. Bailey	native
Cyperaceae	Carex subfusca W. Boott	native
Cyperaceae	Carex subnigricans Stacey	native
Cyperaceae	Carex tahoensis F.J. Smiley	native
Cyperaceae	Carex tompkinsii J.T. Howell	native
Cyperaceae	Carex utriculata Boott	native
Cyperaceae	Carex vernacula L.H. Bailey	native
Cyperaceae	Carex vesicaria L.	native
Cyperaceae	Carex whitneyi Olney	native
Cyperaceae	Cyperus bipartitus Torr.	native
Cyperaceae	Cyperus eragrostis Lam.	native
Cyperaceae	Cyperus squarrosus L.	native

Cyperaceae	<i>Cyperus strigosus</i> L.	native
Cyperaceae	<i>Dulichium arundinaceum</i> (L.) Britton	native
Cyperaceae	<i>Eleocharis acicularis</i> (L.) Roem. & Schult. var. <i>acicularis</i>	native
Cyperaceae	<i>Eleocharis acicularis</i> (L.) Roem. & Schult. var. <i>bella</i> Piper	native
Cyperaceae	<i>Eleocharis macrostachya</i> Britton	native
Cyperaceae	<i>Eleocharis montevidensis</i> Kunth	native
Cyperaceae	<i>Eleocharis pauciflora</i> (Lightf.) Link	native
Cyperaceae	<i>Eriophorum criniger</i> (A. Gray) Beetle	native
Cyperaceae	<i>Fimbristylis vahlii</i> (Lam.) Link	native
Cyperaceae	<i>Lipocarpha occidentalis</i> (A. Gray) G.C. Tucker	native
Cyperaceae	<i>Scirpus clementis</i> M.E. Jones	native
Cyperaceae	<i>Scirpus congdonii</i> Britton	native
Cyperaceae	<i>Scirpus microcarpus</i> J. Presl & C. Presl	native
Datisceae	<i>Datisca glomerata</i> (C. Presl) Baill.	native
Dennstaedtiaceae	<i>Pteridium aquilinum</i> (L.) Kuhn var. <i>pubescens</i> L. Underw.	native
Droseraceae	<i>Drosera rotundifolia</i> L.	native
Dryopteridaceae	<i>Athyrium alpestre</i> (D.H. Hoppe) Clairv. var. <i>americanum</i> Butters	native
Dryopteridaceae	<i>Athyrium filix-femina</i> (L.) Roth var. <i>cyclosorum</i> Rupr.	native
Dryopteridaceae	<i>Cystopteris fragilis</i> (L.) Bernh.	native
Dryopteridaceae	<i>Dryopteris arguta</i> (Kaulf.) Maxon	native
Dryopteridaceae	<i>Polystichum imbricans</i> (D.C. Eaton) D.H. Wagner ssp. <i>imbricans</i>	native
Dryopteridaceae	<i>Woodsia oregana</i> D.C. Eaton	native
Dryopteridaceae	<i>Woodsia scopulina</i> D.C. Eaton	native
Equisetaceae	<i>Equisetum arvense</i> L.	native
Equisetaceae	<i>Equisetum hyemale</i> L. ssp. <i>affine</i> (Engelm.) Calder & Roy L. Taylor	native
Equisetaceae	<i>Equisetum laevigatum</i> A. Braun	native
Ericaceae	<i>Allotropa virgata</i> A. Gray	native
Ericaceae	<i>Arctostaphylos mewukka</i> Merriam	native
Ericaceae	<i>Arctostaphylos nevadensis</i> A. Gray	native
Ericaceae	<i>Arctostaphylos patula</i> Greene	native
Ericaceae	<i>Arctostaphylos viscida</i> Parry ssp. <i>mariposa</i> (Dudley) P. Wells	native
Ericaceae	<i>Arctostaphylos viscida</i> Parry ssp. <i>viscida</i>	native
Ericaceae	<i>Cassiope mertensiana</i> (Bong.) Don	native
Ericaceae	<i>Chimaphila menziesii</i> (D. Don) Sprengel	native
Ericaceae	<i>Chimaphila umbellata</i> (L.) Bartram	native
Ericaceae	<i>Gaultheria humifusa</i> (Graham) Rydb.	native
Ericaceae	<i>Hemitomes congestum</i> A. Gray	native
Ericaceae	<i>Kalmia polifolia</i> Wangenh. ssp. <i>microphylla</i> (Hook.) Calder & Roy L. Taylor	native
Ericaceae	<i>Ledum glandulosum</i> Nutt.	native

Ericaceae	<i>Orthilia secunda</i> (L.) House	native
Ericaceae	<i>Phyllodoce breweri</i> (A. Gray) Maxim.	native
Ericaceae	<i>Pityopus californica</i> (Eastw.) H.F. Copel.	native
Ericaceae	<i>Pleuricospora fimbriolata</i> A. Gray	native
Ericaceae	<i>Pterospora andromedea</i> Nutt.	native
Ericaceae	<i>Pyrola asarifolia</i> Michx. ssp. <i>asarifolia</i>	native
Ericaceae	<i>Pyrola minor</i> L.	native
Ericaceae	<i>Pyrola picta</i> Sm.	native
Ericaceae	<i>Rhododendron occidentale</i> (Torr. & A. Gray) A. Gray	native
Ericaceae	<i>Sarcodes sanguinea</i> Torr.	native
Ericaceae	<i>Vaccinium caespitosum</i> Michx.	native
Ericaceae	<i>Vaccinium uliginosum</i> L. ssp. <i>occidentale</i> (A. Gray) Hultén	native
Euphorbiaceae	<i>Chamaesyce maculata</i> (L.) Small	non-native
Euphorbiaceae	<i>Chamaesyce ocellata</i> (Durand & Hilg.) Millsp. ssp. <i>ocellata</i>	native
Euphorbiaceae	<i>Chamaesyce serpyllifolia</i> (Pers.) Small ssp. <i>hirtula</i> (S. Watson) Koutnik	native
Euphorbiaceae	<i>Chamaesyce serpyllifolia</i> (Pers.) Small ssp. <i>serpyllifolia</i>	native
Euphorbiaceae	<i>Eremocarpus setigerus</i> (Hook.) Benth.	native
Euphorbiaceae	<i>Euphorbia crenulata</i> Engelm.	native
Euphorbiaceae	<i>Euphorbia peplus</i> L.	non-native
Euphorbiaceae	<i>Euphorbia spathulata</i> Lam.	native
Fabaceae	<i>Astragalus bolanderi</i> A. Gray	native
Fabaceae	<i>Astragalus congdonii</i> S. Watson	native
Fabaceae	<i>Astragalus didymocarpus</i> Hook. & Arn.	native
Fabaceae	<i>Astragalus gambelianus</i> E. Sheldon	native
Fabaceae	<i>Astragalus kentrophyta</i> A. Gray var. <i>danaus</i> (Barneby) Barneby	native
Fabaceae	<i>Astragalus ravenii</i> Barneby	native
Fabaceae	<i>Cercis occidentalis</i> Torr.	native
Fabaceae	<i>Genista monspessulana</i> (L.) L.A.S. Johnson	non-native
Fabaceae	<i>Lathyrus jepsonii</i> Greene var. <i>californicus</i> (S. Watson) Hoover	native
Fabaceae	<i>Lathyrus latifolius</i> L.	non-native
Fabaceae	<i>Lathyrus sulphureus</i> A. Gray	native
Fabaceae	<i>Lotus argophyllus</i> (A. Gray) Greene var. <i>argophyllus</i>	native
Fabaceae	<i>Lotus crassifolius</i> (Benth.) Greene var. <i>crassifolius</i>	native
Fabaceae	<i>Lotus humistratus</i> Greene	native
Fabaceae	<i>Lotus micranthus</i> Benth.	native
Fabaceae	<i>Lotus nevadensis</i> (S. Watson) Greene var. <i>nevadensis</i>	native
Fabaceae	<i>Lotus oblongifolius</i> (Benth.) Greene var. <i>cupreus</i> (Greene) Ottley	native
Fabaceae	<i>Lotus oblongifolius</i> (Benth.) Greene var. <i>oblongifolius</i>	native
Fabaceae	<i>Lotus procumbens</i> (Greene) Greene var. <i>jepsonii</i> (Ottley) Ottley	native

Fabaceae	<i>Lotus purshianus</i> Clem. & E.G. Clem. var. <i>purshianus</i>	native
Fabaceae	<i>Lotus scoparius</i> (Nutt.) Ottley	native
Fabaceae	<i>Lotus stipularis</i> (Benth.) Greene var. <i>ottleyi</i> Isely	native
Fabaceae	<i>Lotus stipularis</i> (Benth.) Greene var. <i>stipularis</i>	native
Fabaceae	<i>Lotus strigosus</i> (Nutt.) Greene	native
Fabaceae	<i>Lotus wrangelianus</i> Fisch. & C.A. Mey.	native
Fabaceae	<i>Lupinus albicaulis</i> Hook	native
Fabaceae	<i>Lupinus albifrons</i> Benth. var. <i>albifrons</i>	native
Fabaceae	<i>Lupinus andersonii</i> S. Watson	native
Fabaceae	<i>Lupinus benthamii</i> A. Heller	native
Fabaceae	<i>Lupinus bicolor</i> Lindl.	native
Fabaceae	<i>Lupinus breweri</i> A. Gray var. <i>breweri</i>	native
Fabaceae	<i>Lupinus breweri</i> A. Gray var. <i>bryoides</i> C.P. Sm.	native
Fabaceae	<i>Lupinus breweri</i> A. Gray var. <i>grandiflorus</i> C.P. Sm.	native
Fabaceae	<i>Lupinus covillei</i> Greene	native
Fabaceae	<i>Lupinus fulcratus</i> Greene	native
Fabaceae	<i>Lupinus grayi</i> S. Watson	native
Fabaceae	<i>Lupinus latifolius</i> J. Agardh var. <i>columbianus</i> (A. Heller) C.P. Sm.	native
Fabaceae	<i>Lupinus lepidus</i> Douglas var. <i>confertus</i> (Kellogg) C.P. Sm.	native
Fabaceae	<i>Lupinus lepidus</i> Douglas var. <i>culbertsonii</i> (Greene) C.P. Sm.	native
Fabaceae	<i>Lupinus lepidus</i> Douglas var. <i>lobbii</i> (S. Watson) C. Hitchc	native
Fabaceae	<i>Lupinus lepidus</i> Douglas var. <i>ramosus</i> Jeps.	native
Fabaceae	<i>Lupinus lepidus</i> Douglas var. <i>sellulus</i> (Kellogg) Barneby	native
Fabaceae	<i>Lupinus microcarpus</i> Sims var. <i>microcarpus</i>	native
Fabaceae	<i>Lupinus nanus</i> Benth.	native
Fabaceae	<i>Lupinus polyphyllus</i> Lindl. var. <i>burkei</i> (S. Watson) C.L. Hitchc.	native
Fabaceae	<i>Lupinus pratensis</i> A. Heller var. <i>pratensis</i>	native
Fabaceae	<i>Lupinus stiversii</i> Kellogg	native
Fabaceae	<i>Medicago lupulina</i> L.	non-native
Fabaceae	<i>Medicago polymorpha</i> L.	non-native
Fabaceae	<i>Medicago sativa</i> L.	non-native
Fabaceae	<i>Melilotus albus</i> Medik.	non-native
Fabaceae	<i>Melilotus indicus</i> (L.) All.	non-native
Fabaceae	<i>Melilotus officinalis</i> (L.) Pall.	non-native
Fabaceae	<i>Oxytropis parryi</i> A. Gray	native
Fabaceae	<i>Spartium junceum</i> L.	non-native
Fabaceae	<i>Trifolium albopurpureum</i> Torr. & A. Gray var. <i>albopurpureum</i>	native
Fabaceae	<i>Trifolium breweri</i> S. Watson	native
Fabaceae	<i>Trifolium campestre</i> Schreb.	non-native
Fabaceae	<i>Trifolium ciliolatum</i> Benth.	native

Fabaceae	<i>Trifolium cyathiferum</i> Lindl.	native
Fabaceae	<i>Trifolium dubium</i> Sibth.	non-native
Fabaceae	<i>Trifolium hirtum</i> All.	non-native
Fabaceae	<i>Trifolium longipes</i> Nutt.	native
Fabaceae	<i>Trifolium microcephalum</i> Pursh	native
Fabaceae	<i>Trifolium monanthum</i> A. Gray var. <i>monanthum</i>	native
Fabaceae	<i>Trifolium obtusiflorum</i> Hook. & Arn.	native
Fabaceae	<i>Trifolium oliganthum</i> Steudel	native
Fabaceae	<i>Trifolium repens</i> L.	non-native
Fabaceae	<i>Trifolium variegatum</i> Nutt.	native
Fabaceae	<i>Trifolium willdenovii</i> Sprengel	native
Fabaceae	<i>Trifolium wormskioldii</i> Lehm.	native
Fabaceae	<i>Vicia americana</i> Willd. var. <i>americana</i>	native
Fabaceae	<i>Vicia benghalensis</i> L.	non-native
Fabaceae	<i>Vicia sativa</i> L.	non-native
Fabaceae	<i>Vicia villosa</i> Roth ssp. <i>varia</i> (Host) Corbière	non-native
Fagaceae	<i>Chrysolepis sempervirens</i> (Kellogg) Hjelmq.	native
Fagaceae	<i>Quercus berberidifolia</i> Liebm.	native
Fagaceae	<i>Quercus chrysolepis</i> Liebm.	native
Fagaceae	<i>Quercus douglasii</i> Hook. & Arn.	native
Fagaceae	<i>Quercus garryana</i> Hook. var. <i>breweri</i> (Engelm.) Jeps.	native
Fagaceae	<i>Quercus kelloggii</i> Newb.	native
Fagaceae	<i>Quercus vacciniifolia</i> Kellogg	native
Fagaceae	<i>Quercus wislizeni</i> A.DC. var. <i>wislizeni</i>	native
Fagaceae	<i>Quercus x morehus</i> Kellogg	native
Garryaceae	<i>Garrya flavescens</i> S. Watson	native
Gentianaceae	<i>Centaurium venustum</i> (A. Gray) B.L. Rob.	native
Gentianaceae	<i>Gentiana calycosa</i> Griseb.	native
Gentianaceae	<i>Gentiana newberryi</i> A. Gray var. <i>tiogana</i> (A. Heller) J. Pringle	native
Gentianaceae	<i>Gentianella amarella</i> (L.) Boerner ssp. <i>acuta</i> (Michx.) J.M. Gillett	native
Gentianaceae	<i>Gentianella tenella</i> (Rottb.) Boerner ssp. <i>tenella</i>	native
Gentianaceae	<i>Gentianopsis holopetala</i> (A. Gray) H.H. Iltis	native
Gentianaceae	<i>Gentianopsis simplex</i> (A. Gray) H.H. Iltis	native
Gentianaceae	<i>Swertia perennis</i> L.	native
Gentianaceae	<i>Swertia radiata</i> (Kellogg) Kuntze	native
Gentianaceae	<i>Swertia tubulosa</i> (Coville) Jeps.	native
Geraniaceae	<i>Erodium botrys</i> (Cav.) Bertol.	non-native
Geraniaceae	<i>Erodium brachycarpum</i> (Godr.) Thell.	non-native
Geraniaceae	<i>Erodium cicutarium</i> (L.) L'Hér. ex Aiton	non-native
Geraniaceae	<i>Erodium moschatum</i> (L.) L'Hér. ex Aiton	non-native

Geraniaceae	Geranium californicum G.N. Jones & F.L. Jones	native
Geraniaceae	Geranium carolinianum L.	native
Geraniaceae	Geranium dissectum L.	non-native
Geraniaceae	Geranium molle L.	non-native
Geraniaceae	Geranium richardsonii Fisch. & Trautv.	native
Grossulariaceae	Ribes amarum McClatchie	native
Grossulariaceae	Ribes cereum Douglas var. inebrians (Lindl.) C.L. Hitchc.	native
Grossulariaceae	Ribes inerme Rydb. var. inerme	native
Grossulariaceae	Ribes lasianthum Greene	native
Grossulariaceae	Ribes menziesii Pursh	native
Grossulariaceae	Ribes menziesii Pursh var. ixoderme Quick	native
Grossulariaceae	Ribes montigenum McClatchie	native
Grossulariaceae	Ribes nevadense Kellogg	native
Grossulariaceae	Ribes quercetorum Greene	native
Grossulariaceae	Ribes roezlii Regel var. roezlii	native
Grossulariaceae	Ribes tularensis (Coville) Fedde	native
Grossulariaceae	Ribes velutinum Greene	native
Grossulariaceae	Ribes viscosissimum Pursh	native
Hippocastanaceae	Aesculus californica (Spach) Nutt.	native
Hydrophyllaceae	Draperia systyla (A. Gray) Torr.	native
Hydrophyllaceae	Emmenanthe penduliflora Benth. var. penduliflora	native
Hydrophyllaceae	Eriodictyon californicum (Hook. & Arn.) Torr.	native
Hydrophyllaceae	Hesperochiron californicus (Benth.) S. Watson	native
Hydrophyllaceae	Hesperochiron pumilus (Griseb.) Porter	native
Hydrophyllaceae	Hydrophyllum occidentale (S. Watson) A. Gray	native
Hydrophyllaceae	Nama rothrockii A. Gray	native
Hydrophyllaceae	Nemophila heterophylla Fisch. & C.A. Mey.	native
Hydrophyllaceae	Nemophila maculata Lindl.	native
Hydrophyllaceae	Nemophila menziesii Hook. & Arn. var. menziesii	native
Hydrophyllaceae	Nemophila pulchella Eastw. var. pulchella	native
Hydrophyllaceae	Nemophila spatulata Coville	native
Hydrophyllaceae	Phacelia austromontana J.T. Howell	native
Hydrophyllaceae	Phacelia cicutaria Greene var. cicutaria	native
Hydrophyllaceae	Phacelia congdonii Greene	native
Hydrophyllaceae	Phacelia cryptantha Greene	native
Hydrophyllaceae	Phacelia egena (Brand) J.T. Howell	native
Hydrophyllaceae	Phacelia eisenii Brandegee	native
Hydrophyllaceae	Phacelia hastata Lehm. ssp. compacta (Brand) Heckard	native
Hydrophyllaceae	Phacelia heterophylla Pursh ssp. virgata (Greene) Heckard	native
Hydrophyllaceae	Phacelia humilis Torr. & A. Gray var. humilis	native

Hydrophyllaceae	Phacelia hydrophylloides A. Gray	native
Hydrophyllaceae	Phacelia imbricata Greene ssp. imbricata	native
Hydrophyllaceae	Phacelia mutabilis Greene	native
Hydrophyllaceae	Phacelia orogenes Brand	native
Hydrophyllaceae	Phacelia purpusii Brandegee	native
Hydrophyllaceae	Phacelia ramosissima Lehm. var. eremophila (Greene) J.F. Macbr.	native
Hydrophyllaceae	Phacelia ramosissima Lehm. var. ramosissima	native
Hydrophyllaceae	Pholistoma auritum (Lindl.) Lilja	native
Hydrophyllaceae	Pholistoma membranaceum (Benth.) Constance	native
Hydrophyllaceae	Turricula parryi (A. Gray) J.F. Macbr.	native
Hypericaceae	Hypericum anagalloides Cham. & Schldl.	native
Hypericaceae	Hypericum formosum Kunth var. scouleri (Hook.) J.M. Coult.	native
Iridaceae	Iris hartwegii Baker ssp. hartwegii	native
Iridaceae	Iris munzii R.C. Foster	native
Iridaceae	Sisyrinchium elmeri Greene	native
Iridaceae	Sisyrinchium idahoense E.P. Bicknell	native
Isoetaceae	Isoetes bolanderi Engelm. var. bolanderi	native
Isoetaceae	Isoetes bolanderi Engelm. var. pygmaea (Engelm.) Clute	native
Isoetaceae	Isoetes howellii Engelm.	native
Isoetaceae	Isoetes nuttallii Engelm.	native
Juncaceae	Juncus balticus Willd.	native
Juncaceae	Juncus bryoides F.J. Herm.	native
Juncaceae	Juncus bufonius L. var. bufonius	native
Juncaceae	Juncus bufonius L. var. occidentalis F.J. Herm.	native
Juncaceae	Juncus capillaris F.J. Herm.	native
Juncaceae	Juncus drummondii E. Mey.	native
Juncaceae	Juncus effusus L. var. exiguus Fernald & Wiegand	native
Juncaceae	Juncus effusus L. var. pacificus Fernald & Wiegand	native
Juncaceae	Juncus ensifolius Wikstr.	native
Juncaceae	Juncus hemiendytus F.J. Herm. var. abjectus (F.J. Herm.) Ertter	native
Juncaceae	Juncus hemiendytus F.J. Herm. var. hemiendytus	native
Juncaceae	Juncus kelloggii Engelm.	native
Juncaceae	Juncus longistylis Torr.	native
Juncaceae	Juncus macrandrus Coville	native
Juncaceae	Juncus mertensianus Bong.	native
Juncaceae	Juncus mexicanus Willd.	native
Juncaceae	Juncus nevadensis S. Watson	native
Juncaceae	Juncus orthophyllus Coville	native
Juncaceae	Juncus oxymeris Engelm.	native
Juncaceae	Juncus parryi Engelm.	native

Juncaceae	Luzula comosa E. Mey.	native
Juncaceae	Luzula divaricata S. Watson	native
Juncaceae	Luzula orestera Sharsm.	native
Juncaceae	Luzula parviflora (Ehrh.) Desv.	native
Juncaceae	Luzula spicata (L.) DC.	native
Juncaceae	Luzula subcongesta (S. Watson) Jeps.	native
Juncaginaceae	Triglochin palustris L.	native
Lamiaceae	Agastache urticifolia (Benth.) Kuntze	native
Lamiaceae	Lamium amplexicaule L.	non-native
Lamiaceae	Lamium purpureum L.	non-native
Lamiaceae	Marrubium vulgare L.	non-native
Lamiaceae	Mentha arvensis L.	native
Lamiaceae	Mentha pulegium L.	non-native
Lamiaceae	Mentha spicata L. var. spicata	non-native
Lamiaceae	Monardella glauca Greene	native
Lamiaceae	Monardella lanceolata A. Gray	native
Lamiaceae	Monardella odoratissima Benth. ssp. pallida (A. Heller) Epling	native
Lamiaceae	Monardella sheltonii Torr.	native
Lamiaceae	Monardella villosa Benth. ssp. villosa	native
Lamiaceae	Prunella vulgaris L. var. lanceolata (Barton) Fernald	native
Lamiaceae	Salvia columbariae Benth.	native
Lamiaceae	Scutellaria bolanderi A. Gray ssp. bolanderi	native
Lamiaceae	Scutellaria siphocampyloides Vatke	native
Lamiaceae	Scutellaria tuberosa Benth.	native
Lamiaceae	Stachys albens A. Gray	native
Lamiaceae	Trichostema lanceolatum Benth.	native
Lamiaceae	Trichostema oblongum Benth.	native
Lauraceae	Umbellularia californica (Hook. & Arn.) Nutt.	native
Lemnaceae	Lemna minor L.	native
Lemnaceae	Lemna trisulca L.	native
Lentibulariaceae	Utricularia intermedia Hayne	native
Lentibulariaceae	Utricularia vulgaris L.	native
Liliaceae	Allium abramsii (Traub) McNeal	native
Liliaceae	Allium bisceptrum S. Watson var. bisceptrum	native
Liliaceae	Allium campanulatum S. Watson	native
Liliaceae	Allium hyalinum Curran	native
Liliaceae	Allium membranaceum Traub	native
Liliaceae	Allium obtusum Lemmon	native
Liliaceae	Allium parvum Kellogg	native
Liliaceae	Allium tribracteatum Torr.	native

Liliaceae	<i>Allium validum</i> S. Watson	native
Liliaceae	<i>Brodiaea coronaria</i> (Salisb.) Engl. ssp. <i>coronaria</i>	native
Liliaceae	<i>Brodiaea elegans</i> Hoover ssp. <i>elegans</i>	native
Liliaceae	<i>Calochortus amoenus</i> Greene	native
Liliaceae	<i>Calochortus invenustus</i> Greene	native
Liliaceae	<i>Calochortus leichtlinii</i> Hook. f.	native
Liliaceae	<i>Calochortus minimus</i> Ownbey	native
Liliaceae	<i>Calochortus superbus</i> J.T. Howell	native
Liliaceae	<i>Calochortus venustus</i> Benth.	native
Liliaceae	<i>Camassia quamash</i> (Pursh) Greene ssp. <i>quamash</i>	native
Liliaceae	<i>Chlorogalum pomeridianum</i> (DC.) Kunth var. <i>pomeridianum</i>	native
Liliaceae	<i>Clintonia uniflora</i> (Schult.) Kunth	native
Liliaceae	<i>Dichelostemma capitatum</i> (Benth.) A.W. Wood	native
Liliaceae	<i>Dichelostemma volubile</i> (Kellogg) A. Heller	native
Liliaceae	<i>Disporum hookeri</i> (Torr.) G. Nicholson	native
Liliaceae	<i>Erythronium pusaterii</i> (Munz & J.T. Howell) Shevock, Bartel, & G.A. Allen	native
Liliaceae	<i>Fritillaria atropurpurea</i> Nutt.	native
Liliaceae	<i>Fritillaria micrantha</i> A. Heller	native
Liliaceae	<i>Fritillaria pinetorum</i> Davidson	native
Liliaceae	<i>Lilium kelleyanum</i> Lemmon	native
Liliaceae	<i>Lilium pardalinum</i> Kellogg	native
Liliaceae	<i>Lilium parvum</i> Kellogg	native
Liliaceae	<i>Narthecium californicum</i> Baker	native
Liliaceae	<i>Smilacina racemosa</i> (L.) Link	native
Liliaceae	<i>Smilacina stellata</i> (L.) Desf.	native
Liliaceae	<i>Tofieldia occidentalis</i> S. Watson ssp. <i>occidentalis</i>	native
Liliaceae	<i>Triteleia ixioides</i> (S. Watson) Greene ssp. <i>anilina</i> (Greene) L.W. Lenz	native
Liliaceae	<i>Triteleia ixioides</i> (S. Watson) Greene ssp. <i>scabra</i> (Greene) L.W. Lenz	native
Liliaceae	<i>Triteleia laxa</i> Benth.	native
Liliaceae	<i>Veratrum californicum</i> Durand var. <i>californicum</i>	native
Liliaceae	<i>Yucca whipplei</i> Torr.	native
Liliaceae	<i>Zigadenus exaltatus</i> Eastw.	native
Liliaceae	<i>Zigadenus venenosus</i> S. Watson var. <i>venenosus</i>	native
Limnanthaceae	<i>Floerkea proserpinacoides</i> Willd.	native
Limnanthaceae	<i>Limnanthes montana</i> Jeps.	native
Linaceae	<i>Hesperolinon micranthum</i> (A. Gray) Small	native
Linaceae	<i>Linum lewisii</i> Pursh var. <i>alpicola</i> Jeps.	native
Loasaceae	<i>Mentzelia congesta</i> Torr. & A. Gray	native
Loasaceae	<i>Mentzelia crocea</i> Kellogg	native

Loasaceae	Mentzelia dispersa S. Watson	native
Loasaceae	Mentzelia laevicaulis (Hook.) Torr. & A. Gray	native
Lythraceae	Lythrum hyssopifolia L.	non-native
Malvaceae	Malacothamnus fremontii A. Gray	native
Malvaceae	Malva neglecta Wallr.	non-native
Malvaceae	Malva parviflora L.	non-native
Malvaceae	Sidalcea oregana (Torr. & A. Gray) A. Gray ssp. spicata (Regel) C.L. Hitchc.	native
Malvaceae	Sidalcea ranunculacea Greene	native
Malvaceae	Sidalcea reptans Greene	native
Molluginaceae	Mollugo verticillata L.	non-native
Moraceae	Ficus carica L.	non-native
Moraceae	Morus alba L.	non-native
Myrtaceae	Eucalyptus citriodora Hook.	non-native
Oleaceae	Fraxinus dipetala Hook. & Arn.	native
Oleaceae	Ligustrum sinense Lour.	non-native
Oleaceae	Olea europaea L.	non-native
Onagraceae	Camissonia campestris (Greene) P.H. Raven	native
Onagraceae	Camissonia graciliflora (Hook. & Arn.) P.H. Raven	native
Onagraceae	Camissonia hirtella (Greene) P.H. Raven	native
Onagraceae	Camissonia ignota (Jeps.) P.H. Raven	native
Onagraceae	Circaea alpina L. ssp. pacifica (Asch. & Magnus) P.H. Raven	native
Onagraceae	Clarkia cylindrica (Jeps.) F.H. Lewis & M.R. Lewis	native
Onagraceae	Clarkia dudleyana (Abrams) J.F. Macbr.	native
Onagraceae	Clarkia heterandra (Torr.) F.H. Lewis & P.H. Raven	native
Onagraceae	Clarkia purpurea (Curtis) Nelson & J.F. Macbr. ssp. quadrivulnera (Lindl.) F.H. Lewis & M.R. Lewis	native
Onagraceae	Clarkia purpurea (Curtis) Nelson & J.F. Macbr. ssp. viminea (Hook.) F.H. Lewis & M.R. Lewis	native
Onagraceae	Clarkia rhomboidea Douglas	native
Onagraceae	Clarkia speciosa F.H. Lewis & M.R. Lewis ssp. nitens (F.H. Lewis & M.R. Lewis) F.H. Lewis	native
Onagraceae	Clarkia unguiculata Lindl.	native
Onagraceae	Epilobium anagallidifolium Lam.	native
Onagraceae	Epilobium angustifolium L. ssp. circumvagum Mosq.	native
Onagraceae	Epilobium brachycarpum C. Presl	native
Onagraceae	Epilobium canum (Greene) P.H. Raven ssp. latifolium (Hook.) P.H. Raven	native
Onagraceae	Epilobium ciliatum Raf. ssp. ciliatum	native
Onagraceae	Epilobium ciliatum Raf. ssp. glandulosum (Lehm.) Hoch & P.H. Raven	native

Onagraceae	<i>Epilobium densiflorum</i> (Lindl.) Hoch & P.H. Raven	native
Onagraceae	<i>Epilobium glaberrimum</i> Barbey ssp. <i>fastigiatum</i> (Nutt.) Hoch & P.H. Raven	native
Onagraceae	<i>Epilobium glaberrimum</i> Barbey ssp. <i>glaberrimum</i>	native
Onagraceae	<i>Epilobium hallianum</i> Hausskn.	native
Onagraceae	<i>Epilobium hornemannii</i> Reichb. ssp. <i>hornemannii</i>	native
Onagraceae	<i>Epilobium lactiflorum</i> Hausskn.	native
Onagraceae	<i>Epilobium latifolium</i> L.	native
Onagraceae	<i>Epilobium minutum</i> Lehm.	native
Onagraceae	<i>Epilobium obcordatum</i> A. Gray	native
Onagraceae	<i>Epilobium oreganum</i> Greene	native
Onagraceae	<i>Epilobium oregonense</i> Hausskn.	native
Onagraceae	<i>Epilobium torreyi</i> (S. Watson) Hoch & P.H. Raven	native
Onagraceae	<i>Gayophytum decipiens</i> F.H. Lewis & J. Szweykowski	native
Onagraceae	<i>Gayophytum diffusum</i> Torr. & A. Gray ssp. <i>diffusum</i>	native
Onagraceae	<i>Gayophytum diffusum</i> Torr. & A. Gray ssp. <i>parviflorum</i> F.H. Lewis & J. Szweykowski	native
Onagraceae	<i>Gayophytum eriospermum</i> Coville	native
Onagraceae	<i>Gayophytum heterozygum</i> F.H. Lewis & J. Szweykowski	native
Onagraceae	<i>Gayophytum humile</i> Juss.	native
Onagraceae	<i>Gayophytum racemosum</i> Torr. & A. Gray	native
Onagraceae	<i>Ludwigia palustris</i> (L.) Elliott	native
Onagraceae	<i>Oenothera elata</i> Kunth ssp. <i>hirsutissima</i> (S. Watson) W. Dietr.	native
Onagraceae	<i>Oenothera laciniata</i> Hill	non-native
Ophioglossaceae	<i>Botrychium minganense</i> Victorin	native
Ophioglossaceae	<i>Botrychium multifidum</i> (S.G. Gmel.) Rupr.	native
Ophioglossaceae	<i>Botrychium simplex</i> E. Hitchc.	native
Orchidaceae	<i>Cephalanthera austiniae</i> (A. Gray) A. Heller	native
Orchidaceae	<i>Corallorhiza maculata</i> (Raf.) Raf.	native
Orchidaceae	<i>Epipactis gigantea</i> Hook.	native
Orchidaceae	<i>Goodyera oblongifolia</i> Raf.	native
Orchidaceae	<i>Listera convallarioides</i> (Sw.) Nutt.	native
Orchidaceae	<i>Piperia elegans</i> (Lindl.) Rydb.	native
Orchidaceae	<i>Piperia transversa</i> Suksd.	native
Orchidaceae	<i>Piperia unalascensis</i> (Sprengel) Rydb.	native
Orchidaceae	<i>Platanthera hyperborea</i> (L.) Lindl.	native
Orchidaceae	<i>Platanthera leucostachys</i> Lindl.	native
Orchidaceae	<i>Platanthera sparsiflora</i> (S. Watson) Schltr.	native
Orchidaceae	<i>Spiranthes porrifolia</i> Lindl.	native
Orchidaceae	<i>Spiranthes romanzoffiana</i> Cham.	native

Orobanchaceae	Orobanche bulbosa G. Beck	native
Orobanchaceae	Orobanche fasciculata Nutt.	native
Orobanchaceae	Orobanche uniflora L.	native
Oxalidaceae	Oxalis corniculata L.	non-native
Oxalidaceae	Oxalis pes-caprae L.	non-native
Papaveraceae	Corydalis caseana A. Gray ssp. caseana	native
Papaveraceae	Dendromecon rigida Benth.	native
Papaveraceae	Dicentra chrysantha (Hook. & Arn.) Walp.	native
Papaveraceae	Dicentra formosa (Haw.) Walp.	native
Papaveraceae	Dicentra nevadensis Eastw.	native
Papaveraceae	Dicentra pauciflora S. Watson	native
Papaveraceae	Dicentra uniflora Kellogg	native
Papaveraceae	Eschscholzia caespitosa Benth.	native
Papaveraceae	Eschscholzia lobbii Greene	native
Papaveraceae	Meconella californica Torr.	native
Papaveraceae	Platystemon californicus Benth.	native
Papaveraceae	Stylomecon heterophylla (Benth.) G.C. Taylor	native
Philadelphaceae	Jamesia americana Torr. & A. Gray var. rosea C.K. Schneid.	native
Philadelphaceae	Philadelphus lewisii Pursh	native
Pinaceae	Abies concolor (Gordon & Glend.) Lindl. ex Hildebr.	native
Pinaceae	Abies magnifica A. Murray bis var. magnifica	native
Pinaceae	Abies magnifica A. Murray bis var. shastensis Lemmon	native
Pinaceae	Pinus albicaulis Engelm.	native
Pinaceae	Pinus balfouriana Grev. & Balf. ssp. austrina Mastrogiuseppe & Mastrogiuseppe	native
Pinaceae	Pinus contorta Loudon ssp. murrayana (Grev. & Balf.) Critchf.	native
Pinaceae	Pinus flexilis James	native
Pinaceae	Pinus jeffreyi Grev. & Balf.	native
Pinaceae	Pinus lambertiana Douglas	native
Pinaceae	Pinus monophylla Torr. & Frémont	native
Pinaceae	Pinus monticola Douglas	native
Pinaceae	Pinus ponderosa Laws.	native
Pinaceae	Pinus ponderosa x jeffreyi	native
Pinaceae	Pinus sabiniana D. Don	non-native
Pinaceae	Tsuga mertensiana (Bong.) Carrière	native
Plantaginaceae	Plantago erecta E. Morris	native
Plantaginaceae	Plantago lanceolata L.	non-native
Plantaginaceae	Plantago major L.	non-native
Platanaceae	Platanus racemosa Nutt.	native
Poaceae	Achnatherum coronatum (Thurber) Barkworth	native

Poaceae	<i>Achnatherum hymenoides</i> (Roem. & Schult.) Barkworth	native
Poaceae	<i>Achnatherum latiglume</i> (Swallen) Barkworth	native
Poaceae	<i>Achnatherum lemmonii</i> (Vasey) Barkworth	native
Poaceae	<i>Achnatherum lettermanii</i> (Vasey) Barkworth	native
Poaceae	<i>Achnatherum nelsonii</i> (Scribner) Barkworth ssp. <i>dorei</i> (Barkworth & J.R. Maze) Barkworth	native
Poaceae	<i>Achnatherum nevadense</i> (B.L. Johnson) Barkworth	native
Poaceae	<i>Achnatherum occidentale</i> (Thurber) Barkworth ssp. <i>californicum</i> (Merr. & Burt Davy) Barkworth	native
Poaceae	<i>Achnatherum occidentale</i> (Thurber) Barkworth ssp. <i>occidentale</i>	native
Poaceae	<i>Achnatherum occidentale</i> (Thurber) Barkworth ssp. <i>pubescens</i> (Vasey) Barkworth	native
Poaceae	<i>Achnatherum parishii</i> (Vasey) Barkworth	native
Poaceae	<i>Achnatherum pinetorum</i> (M.E. Jones) Barkworth	native
Poaceae	<i>Achnatherum speciosum</i> (Trin. & Rupr.) Barkworth	native
Poaceae	<i>Agrostis exarata</i> Trin.	native
Poaceae	<i>Agrostis humilis</i> Vasey	native
Poaceae	<i>Agrostis idahoensis</i> Nash	native
Poaceae	<i>Agrostis oregonensis</i> Vasey	native
Poaceae	<i>Agrostis pallens</i> Trin.	native
Poaceae	<i>Agrostis scabra</i> Willd.	native
Poaceae	<i>Agrostis stolonifera</i> L.	non-native
Poaceae	<i>Agrostis thurberiana</i> Hitchc.	native
Poaceae	<i>Agrostis variabilis</i> Rydb.	native
Poaceae	<i>Aira caryophyllea</i> L.	non-native
Poaceae	<i>Alopecurus aequalis</i> Sobol.	native
Poaceae	<i>Alopecurus geniculatus</i> L.	native
Poaceae	<i>Aristida ternipes</i> Cav. var. <i>hamulosa</i> (Henrard) J.S. Trent	native
Poaceae	<i>Arrhenatherum elatius</i> (L.) J. Presl & C. Presl	non-native
Poaceae	<i>Arundo donax</i> L.	non-native
Poaceae	<i>Avena barbata</i> Link	non-native
Poaceae	<i>Avena fatua</i> L.	non-native
Poaceae	<i>Briza maxima</i> L.	non-native
Poaceae	<i>Briza minor</i> L.	non-native
Poaceae	<i>Bromus arenarius</i> Labill.	non-native
Poaceae	<i>Bromus carinatus</i> Hook. & Arn. var. <i>carinatus</i>	native
Poaceae	<i>Bromus catharticus</i> Vahl	non-native
Poaceae	<i>Bromus ciliatus</i> L.	native
Poaceae	<i>Bromus diandrus</i> Roth	non-native
Poaceae	<i>Bromus hordeaceus</i> L.	non-native

Poaceae	<i>Bromus laevipes</i> Shear	native
Poaceae	<i>Bromus madritensis</i> L. ssp. <i>madritensis</i>	non-native
Poaceae	<i>Bromus madritensis</i> L. ssp. <i>rubens</i> (L.) Husn.	non-native
Poaceae	<i>Bromus orcuttianus</i> Vasey	native
Poaceae	<i>Bromus sterilis</i> L.	non-native
Poaceae	<i>Bromus suksdorfii</i> Vasey	native
Poaceae	<i>Bromus tectorum</i> L.	non-native
Poaceae	<i>Bromus trinii</i> Desv.	non-native
Poaceae	<i>Calamagrostis breweri</i> Thurber	native
Poaceae	<i>Calamagrostis canadensis</i> (Michx.) P. Beauv.	native
Poaceae	<i>Calamagrostis purpurascens</i> R.Br.	native
Poaceae	<i>Calamagrostis stricta</i> (Timm) Koeler ssp. <i>inexpansa</i> (A. Gray) C.W. Greene	native
Poaceae	<i>Cinna bolanderi</i> Scribner	native
Poaceae	<i>Cinna latifolia</i> (Goepp.) Griseb.	native
Poaceae	<i>Crypsis schoenoides</i> (L.) Lam.	non-native
Poaceae	<i>Cynodon dactylon</i> (L.) Pers.	non-native
Poaceae	<i>Cynosurus echinatus</i> L.	non-native
Poaceae	<i>Dactylis glomerata</i> L.	non-native
Poaceae	<i>Danthonia californica</i> Bol. var. <i>americana</i> (Scribner) Hitchc.	native
Poaceae	<i>Danthonia intermedia</i> Vasey	native
Poaceae	<i>Danthonia unispicata</i> (Thurber) Macoun	native
Poaceae	<i>Deschampsia atropurpurea</i> (Wahlenb.) Scheele	native
Poaceae	<i>Deschampsia cespitosa</i> (L.) P. Beauv. ssp. <i>cespitosa</i>	native
Poaceae	<i>Deschampsia danthonioides</i> (Trin.) Munro	native
Poaceae	<i>Deschampsia elongata</i> (Hook.) Munro	native
Poaceae	<i>Digitaria sanguinalis</i> (L.) Scop.	non-native
Poaceae	<i>Echinochloa crus-galli</i> (L.) P. Beauv.	non-native
Poaceae	<i>Elymus elymoides</i> (Raf.) Swezey ssp. <i>californicus</i> (J.G. Sm.) Barkworth	native
Poaceae	<i>Elymus elymoides</i> (Raf.) Swezey ssp. <i>elymoides</i>	native
Poaceae	<i>Elymus glaucus</i> Buckley ssp. <i>glaucus</i>	native
Poaceae	<i>Elymus glaucus</i> Buckley ssp. <i>jepsonii</i> (Burt Davy) Gould	native
Poaceae	<i>Elymus multisetus</i> (J.G. Sm.) Burt Davy	native
Poaceae	<i>Elymus scribneri</i> (Vasey) M.E. Jones	native
Poaceae	<i>Elymus sierrae</i> Gould	native
Poaceae	<i>Elymus stebbinsii</i> Gould	native
Poaceae	<i>Elymus trachycaulus</i> (Link) Shinn. ssp. <i>subsecundus</i> (Link) Gould	native
Poaceae	<i>Elymus trachycaulus</i> (Link) Shinn. ssp. <i>trachycaulus</i>	native
Poaceae	<i>Elymus</i> x <i>saundersii</i> Vasey (pro sp.)	native

Poaceae	<i>Eragrostis cilianensis</i> (All.) Janch.	non-native
Poaceae	<i>Eragrostis pectinacea</i> (Michx.) Nees var. <i>pectinacea</i>	native
Poaceae	<i>Festuca arundinacea</i> Schreb.	non-native
Poaceae	<i>Festuca brachyphylla</i> Schult. & Schult. f. ssp. <i>breviculmis</i> Fred.	native
Poaceae	<i>Festuca idahoensis</i> Elmer	native
Poaceae	<i>Festuca kingii</i> (S. Watson) Cassidy	native
Poaceae	<i>Festuca occidentalis</i> Hook.	native
Poaceae	<i>Festuca pratensis</i> Huds.	non-native
Poaceae	<i>Festuca rubra</i> L.	native
Poaceae	<i>Festuca saximontana</i> Rydb. var. <i>purpusiana</i> (St.-Yves) Fred. & Pavlick	native
Poaceae	<i>Festuca subulata</i> Trin.	native
Poaceae	<i>Gastridium ventricosum</i> (Gouan) Schinz & Thell.	non-native
Poaceae	<i>Glyceria elata</i> (Nash) M.E. Jones	native
Poaceae	<i>Glyceria striata</i> (Lam.) Hitchc.	native
Poaceae	<i>Hesperostipa comata</i> (Trin. & Rupr.) Barkworth ssp. <i>comata</i>	native
Poaceae	<i>Hesperostipa comata</i> (Trin. & Rupr.) Barkworth ssp. <i>intermedia</i> (Scribner & Tweedy) Barkworth	native
Poaceae	<i>Holcus lanatus</i> L.	non-native
Poaceae	<i>Hordeum brachyantherum</i> Nevski ssp. <i>brachyantherum</i>	native
Poaceae	<i>Hordeum brachyantherum</i> Nevski ssp. <i>californicum</i> (Covas & Stebb.) Bothmer, N. Jacobsen & Seberg	native
Poaceae	<i>Hordeum marinum</i> Huds. ssp. <i>gussoneanum</i> (Parl.) Thell.	non-native
Poaceae	<i>Hordeum murinum</i> L. ssp. <i>leporinum</i> (Link) Arcang.	non-native
Poaceae	<i>Hordeum murinum</i> L. ssp. <i>murinum</i>	non-native
Poaceae	<i>Koeleria macrantha</i> (Ledeb.) Schult.	native
Poaceae	<i>Lamarckia aurea</i> (L.) Moench	non-native
Poaceae	<i>Leptochloa fascicularis</i> (Lam.) A. Gray	native
Poaceae	<i>Leymus triticoides</i> (Buckley) Pilg.	native
Poaceae	<i>Lolium multiflorum</i> Lam.	non-native
Poaceae	<i>Lolium perenne</i> L.	non-native
Poaceae	<i>Lolium temulentum</i> L.	non-native
Poaceae	<i>Melica aristata</i> Bol.	native
Poaceae	<i>Melica bulbosa</i> Geyer	native
Poaceae	<i>Melica californica</i> Scribn. var. <i>nevadensis</i> Boyle	native
Poaceae	<i>Melica imperfecta</i> Trin.	native
Poaceae	<i>Melica stricta</i> Bol.	native
Poaceae	<i>Muhlenbergia andina</i> (Nutt.) Hitchc.	native
Poaceae	<i>Muhlenbergia asperifolia</i> (Nees & Meyen) Parodi	native
Poaceae	<i>Muhlenbergia filiformis</i> (Thurber) Rydb.	native
Poaceae	<i>Muhlenbergia montana</i> (Nutt.) Hitchc.	native

Poaceae	Muhlenbergia richardsonis (Trin.) Rydb.	native
Poaceae	Muhlenbergia rigens (Benth.) Hitchc.	native
Poaceae	Nassella lepida (Hitchc.) Barkworth	native
Poaceae	Nassella pulchra (Hitchc.) Barkworth	native
Poaceae	Panicum acuminatum Sw. var. acuminatum	native
Poaceae	Panicum capillare L.	native
Poaceae	Panicum dichotomiflorum Michx.	non-native
Poaceae	Pascopyrum smithii (Rydb.) A. Löve	native
Poaceae	Paspalum dilatatum Poiret	non-native
Poaceae	Paspalum notatum J. Fleugge	non-native
Poaceae	Phalaris arundinacea L.	non-native
Poaceae	Phalaris minor Retz.	non-native
Poaceae	Phalaris paradoxa L.	non-native
Poaceae	Phleum alpinum L.	native
Poaceae	Phleum pratense L.	non-native
Poaceae	Piptatherum miliaceum (L.) Coss.	non-native
Poaceae	Poa annua L.	non-native
Poaceae	Poa bolanderi Vasey	native
Poaceae	Poa bulbosa L.	non-native
Poaceae	Poa compressa L.	non-native
Poaceae	Poa cusickii Vasey ssp. cusickii	native
Poaceae	Poa cusickii Vasey ssp. epilis (Scribner) W.A. Weber	native
Poaceae	Poa fendleriana (Steudel) Vasey ssp. longiligula (Scribner & Williams) R. Soreng	native
Poaceae	Poa glauca M. Vahl. ssp. rupicola (Nash) W.A. Weber	native
Poaceae	Poa keckii R. Soreng	native
Poaceae	Poa leptocoma Trin. ssp. leptocoma	native
Poaceae	Poa lettermanii Vasey	native
Poaceae	Poa nevadensis Scribner	native
Poaceae	Poa palustris L.	non-native
Poaceae	Poa pratensis L. ssp. pratensis	non-native
Poaceae	Poa secunda J. Presl ssp. secunda	native
Poaceae	Poa stebbinsii R. Soreng	native
Poaceae	Poa wheeleri Vasey	native
Poaceae	Polypogon interruptus Kunth	non-native
Poaceae	Polypogon maritimus Willd.	non-native
Poaceae	Polypogon monspeliensis (L.) Desf.	non-native
Poaceae	Ptilagrostis kingii (Bol.) Barkworth	native
Poaceae	Puccinellia nuttalliana (Schult.) Hitchc.	native
Poaceae	Schismus barbatus (L.) Thell.	non-native

Poaceae	<i>Scribneria bolanderi</i> (Thurber) Hack.	native
Poaceae	<i>Setaria pumila</i> (Poiret) Roem. & Schult.	non-native
Poaceae	<i>Setaria viridis</i> (L.) P. Beauv.	non-native
Poaceae	<i>Sorghum bicolor</i> (L.) Moench	non-native
Poaceae	<i>Sorghum halepense</i> (L.) Pers.	non-native
Poaceae	<i>Torreyochloa erecta</i> (Hitchc.) G.L. Church	native
Poaceae	<i>Torreyochloa pallida</i> (J. Presl) G.L. Church var. <i>pauciflora</i> (J. Presl) J.I. Davis	native
Poaceae	<i>Trisetum canescens</i> Buckley	native
Poaceae	<i>Trisetum spicatum</i> (L.) K. Richt.	native
Poaceae	<i>Trisetum wolfii</i> Vasey	native
Poaceae	<i>Triticum aestivum</i> L.	non-native
Poaceae	<i>Vulpia bromoides</i> (L.) Gray	non-native
Poaceae	<i>Vulpia microstachys</i> (Nutt.) Munro var. <i>ciliata</i> (Beal) Lonard & Gould	native
Poaceae	<i>Vulpia microstachys</i> (Nutt.) Munro var. <i>confusa</i> (Piper) Lonard & Gould	native
Poaceae	<i>Vulpia microstachys</i> (Nutt.) Munro var. <i>microstachys</i>	native
Poaceae	<i>Vulpia microstachys</i> (Nutt.) Munro var. <i>pauciflora</i> (Beal) Lonard & Gould	native
Poaceae	<i>Vulpia myuros</i> (L.) C.C. Gmel. var. <i>hirsuta</i> Hack.	non-native
Poaceae	<i>Vulpia myuros</i> (L.) C.C. Gmel. var. <i>myuros</i>	non-native
Poaceae	<i>Vulpia octoflora</i> (Walter) Rydb. var. <i>hirtella</i> (Piper) Henrard	native
Polemoniaceae	<i>Allophyllum divaricatum</i> (Nutt.) A.D. Grant & V.E. Grant	native
Polemoniaceae	<i>Allophyllum gilioides</i> (Benth.) A.D. Grant & V.E. Grant ssp. <i>violaceum</i> (A. Heller) A.G. Day	native
Polemoniaceae	<i>Allophyllum integrifolium</i> (Brand) A.D. Grant & V.E. Grant	native
Polemoniaceae	<i>Collomia grandiflora</i> Lindl.	native
Polemoniaceae	<i>Collomia heterophylla</i> Hook.	native
Polemoniaceae	<i>Collomia linearis</i> Nutt.	native
Polemoniaceae	<i>Collomia tinctoria</i> Kellogg	native
Polemoniaceae	<i>Eriastrum pluriflorum</i> (A. Heller) H. Mason	native
Polemoniaceae	<i>Eriastrum sparsiflorum</i> (Eastw.) H. Mason	native
Polemoniaceae	<i>Gilia campanulata</i> A. Gray	native
Polemoniaceae	<i>Gilia capillaris</i> Kellogg	native
Polemoniaceae	<i>Gilia capitata</i> Sims ssp. <i>abrotanifolia</i> (Greene) V.E. Grant	native
Polemoniaceae	<i>Gilia leptalea</i> (A. Gray) Greene	native
Polemoniaceae	<i>Gilia tricolor</i> Benth. ssp. <i>diffusa</i> (Congdon) H. Mason & A.D. Grant	native
Polemoniaceae	<i>Gilia tricolor</i> Benth. ssp. <i>tricolor</i>	native
Polemoniaceae	<i>Ipomopsis aggregata</i> (Pursh) V.E. Grant ssp. <i>formosissima</i> (Greene) Wherry	native
Polemoniaceae	<i>Leptodactylon pungens</i> (Torr.) Rydb.	native

Polemoniaceae	<i>Linanthus bicolor</i> (Nutt.) Greene	native
Polemoniaceae	<i>Linanthus ciliatus</i> (Benth.) Greene	native
Polemoniaceae	<i>Linanthus dichotomus</i> Benth.	native
Polemoniaceae	<i>Linanthus filipes</i> (Benth.) Greene	native
Polemoniaceae	<i>Linanthus harknessii</i> (Curran) Greene	native
Polemoniaceae	<i>Linanthus montanus</i> (Greene) Greene	native
Polemoniaceae	<i>Linanthus nuttallii</i> (A. Gray) Milliken	native
Polemoniaceae	<i>Linanthus oblongeolatus</i> (Brand) Jeps.	native
Polemoniaceae	<i>Linanthus pachyphyllus</i> R. Patt.	native
Polemoniaceae	<i>Navarretia breweri</i> (A. Gray) Greene	native
Polemoniaceae	<i>Navarretia divaricata</i> (A. Gray) Greene	native
Polemoniaceae	<i>Navarretia pubescens</i> (Benth.) Hook. & Arn.	native
Polemoniaceae	<i>Phlox austromontana</i> Coville	native
Polemoniaceae	<i>Phlox condensata</i> (A. Gray) E.E. Nelson	native
Polemoniaceae	<i>Phlox diffusa</i> Benth.	native
Polemoniaceae	<i>Phlox dispersa</i> Sharsm.	native
Polemoniaceae	<i>Phlox gracilis</i> (Hook.) Greene	native
Polemoniaceae	<i>Phlox speciosa</i> Pursh ssp. <i>occidentalis</i> (Torr.) Wherry	native
Polemoniaceae	<i>Polemonium californicum</i> Eastw.	native
Polemoniaceae	<i>Polemonium eximium</i> Greene	native
Polygalaceae	<i>Polygala cornuta</i> Kellogg var. <i>cornuta</i>	native
Polygonaceae	<i>Chorizanthe membranacea</i> Benth.	native
Polygonaceae	<i>Eriogonum hirtiflorum</i> S. Watson	native
Polygonaceae	<i>Eriogonum incanum</i> Torr. & A. Gray	native
Polygonaceae	<i>Eriogonum marifolium</i> Torr. & A. Gray	native
Polygonaceae	<i>Eriogonum nudum</i> Benth. var. <i>deductum</i> (Greene) Jeps.	native
Polygonaceae	<i>Eriogonum nudum</i> Benth. var. <i>murinum</i> Reveal	native
Polygonaceae	<i>Eriogonum nudum</i> Benth. var. <i>nudum</i>	native
Polygonaceae	<i>Eriogonum nudum</i> Benth. var. <i>pubiflorum</i> Benth.	native
Polygonaceae	<i>Eriogonum nudum</i> Benth. var. <i>scapigerum</i> (Eastw.) Jeps.	native
Polygonaceae	<i>Eriogonum ovalifolium</i> Nutt. var. <i>nivale</i> (Canby) M.E. Jones	native
Polygonaceae	<i>Eriogonum polypodium</i> Small	native
Polygonaceae	<i>Eriogonum prattenianum</i> Durand var. <i>avium</i> Reveal & Shevock	native
Polygonaceae	<i>Eriogonum rosense</i> A. Nelson & P.B. Kenn.	native
Polygonaceae	<i>Eriogonum roseum</i> Durand & Hilg.	native
Polygonaceae	<i>Eriogonum saxatile</i> S. Watson	native
Polygonaceae	<i>Eriogonum spergulinum</i> A. Gray var. <i>pratense</i> (S. Stokes) J.T. Howell	native
Polygonaceae	<i>Eriogonum spergulinum</i> A. Gray var. <i>reddingianum</i> (M.E. Jones) J.T. Howell	native
Polygonaceae	<i>Eriogonum spergulinum</i> A. Gray var. <i>spergulinum</i>	native

Polygonaceae	Eriogonum umbellatum Torr. var. covillei (Small) Munz & Reveal	native
Polygonaceae	Eriogonum umbellatum Torr. var. furcosum Reveal	native
Polygonaceae	Eriogonum umbellatum Torr. var. nevadense Gand.	native
Polygonaceae	Eriogonum wrightii Benth. var. subscaposum S. Watson	native
Polygonaceae	Eriogonum wrightii Benth. var. trachygonum (Benth.) Jeps.	native
Polygonaceae	Oxyria digyna (L.) Hill	native
Polygonaceae	Polygonum amphibium L. var. stipulaceum N. Coleman	native
Polygonaceae	Polygonum arenastrum Boreau	non-native
Polygonaceae	Polygonum argyrocoleon Kunze	non-native
Polygonaceae	Polygonum bistortoides Pursh	native
Polygonaceae	Polygonum convolvulus L.	non-native
Polygonaceae	Polygonum douglasii Greene ssp. douglasii	native
Polygonaceae	Polygonum douglasii Greene ssp. johnstonii (Munz) J.C. Hickman	native
Polygonaceae	Polygonum lapathifolium L.	native
Polygonaceae	Polygonum minimum S. Watson	native
Polygonaceae	Polygonum parryi Greene	native
Polygonaceae	Polygonum persicaria L.	non-native
Polygonaceae	Polygonum polygaloides Meisn. ssp. kelloggii (Greene) J.C. Hickman	native
Polygonaceae	Polygonum punctatum Elliott	native
Polygonaceae	Polygonum shastense A. Gray	native
Polygonaceae	Pterostegia drymarioides Fisch. & C.A. Mey.	native
Polygonaceae	Rumex acetosella L.	non-native
Polygonaceae	Rumex conglomeratus Murray	non-native
Polygonaceae	Rumex crispus L.	non-native
Polygonaceae	Rumex dentatus L.	non-native
Polygonaceae	Rumex paucifolius S. Watson	native
Polygonaceae	Rumex salicifolius J.A. Weinm. var. denticulatus Torr.	native
Polygonaceae	Rumex salicifolius J.A. Weinm. var. salicifolius	native
Polygonaceae	Rumex salicifolius J.A. Weinm. var. transitorius (Rech.f.) J.C. Hickman	native
Polygonaceae	Rumex salicifolius J.A. Weinm. var. triangulivalvis (Danser) J.C. Hickman	native
Polypodiaceae	Polypodium californicum Kaulf.	native
Polypodiaceae	Polypodium hesperium Maxon	native
Portulacaceae	Calandrinia ciliata (Ruiz & Pav.) DC.	native
Portulacaceae	Calyptridium monospermum Greene	native
Portulacaceae	Calyptridium parryi A. Gray	native
Portulacaceae	Calyptridium pygmaeum Rydb.	native
Portulacaceae	Calyptridium umbellatum (Torr.) Greene var. caudiciferum (A. Gray) Jeps.	native

Portulacaceae	<i>Calyptidium umbellatum</i> (Torr.) Greene var. <i>umbellatum</i>	native
Portulacaceae	<i>Claytonia exigua</i> Torr. & A. Gray ssp. <i>exigua</i>	native
Portulacaceae	<i>Claytonia nevadensis</i> S. Watson	native
Portulacaceae	<i>Claytonia palustris</i> Swanson & Kelley	native
Portulacaceae	<i>Claytonia parviflora</i> Hook. ssp. <i>grandiflora</i> John M. Mill. & K.L. Chambers	native
Portulacaceae	<i>Claytonia perfoliata</i> Willd. ssp. <i>perfoliata</i>	native
Portulacaceae	<i>Claytonia rubra</i> (Howell) Tidestrom ssp. <i>depressa</i> (A. Gray) John M. Mill. & K.L. Chambers	native
Portulacaceae	<i>Claytonia sibirica</i> L.	native
Portulacaceae	<i>Lewisia glandulosa</i> (Rydb.) Dempster	native
Portulacaceae	<i>Lewisia nevadensis</i> (A. Gray) B.L. Rob.	native
Portulacaceae	<i>Lewisia pygmaea</i> (A. Gray) B.L. Rob.	native
Portulacaceae	<i>Lewisia triphylla</i> (S. Watson) B.L. Rob.	native
Portulacaceae	<i>Montia chamissoi</i> (Sprengel) Greene	native
Portulacaceae	<i>Montia fontana</i> L.	native
Potamogetonaceae	<i>Potamogeton gramineus</i> L.	native
Potamogetonaceae	<i>Potamogeton natans</i> L.	native
Primulaceae	<i>Anagallis arvensis</i> L.	non-native
Primulaceae	<i>Androsace septentrionalis</i> L. ssp. <i>subumbellata</i> G.T. Robbins	native
Primulaceae	<i>Dodecatheon alpinum</i> (A. Gray) Greene	native
Primulaceae	<i>Dodecatheon hendersonii</i> A. Gray	native
Primulaceae	<i>Dodecatheon jeffreyi</i> Van Houtte	native
Primulaceae	<i>Dodecatheon redolens</i> (H.M. Hall) H.J. Thompson	native
Primulaceae	<i>Dodecatheon subalpinum</i> Eastw.	native
Primulaceae	<i>Primula suffrutescens</i> A. Gray	native
Pteridaceae	<i>Adiantum aleuticum</i> (Rupr.) C.A. Paris	native
Pteridaceae	<i>Argyrochosma jonesii</i> (Maxon) M.D. Windham	native
Pteridaceae	<i>Aspidotis californica</i> (Hook.) Copel.	native
Pteridaceae	<i>Aspidotis densa</i> (Brack.) Lellinger	native
Pteridaceae	<i>Cheilanthes cooperae</i> D.C. Eaton	native
Pteridaceae	<i>Cheilanthes gracillima</i> D.C. Eaton	native
Pteridaceae	<i>Cheilanthes intertexta</i> (Maxon) Maxon	native
Pteridaceae	<i>Cryptogramma acrostichoides</i> R. Br.	native
Pteridaceae	<i>Pellaea andromedifolia</i> (Kaulf.) Fée	native
Pteridaceae	<i>Pellaea breweri</i> D.C. Eaton	native
Pteridaceae	<i>Pellaea bridgesii</i> Hook.	native
Pteridaceae	<i>Pellaea mucronata</i> (D.C. Eaton) D.C. Eaton var. <i>californica</i> (Lemmon) Munz & I.M. Johnst.	native
Pteridaceae	<i>Pellaea mucronata</i> (D.C. Eaton) D.C. Eaton var. <i>mucronata</i>	native

Pteridaceae	<i>Pentagramma pallida</i> (Weath.) G. Yatskievych, M.D. Windham & E. Wollenweber	native
Pteridaceae	<i>Pentagramma triangularis</i> (Kaulf.) G. Yatskievych, M.D. Windham & E. Wollenweber ssp. <i>triangularis</i>	native
Punicaceae	<i>Punica granatum</i> L.	non-native
Ranunculaceae	<i>Aconitum columbianum</i> Nutt.	native
Ranunculaceae	<i>Actaea rubra</i> (Aiton) Willd.	native
Ranunculaceae	<i>Anemone occidentalis</i> S. Watson	native
Ranunculaceae	<i>Aquilegia formosa</i> Fisch. ex DC.	native
Ranunculaceae	<i>Aquilegia pubescens</i> Coville	native
Ranunculaceae	<i>Aquilegia pubescens</i> x <i>formosa</i>	native
Ranunculaceae	<i>Caltha leptosepala</i> DC. var. <i>biflora</i> (DC.) G. Lawson	native
Ranunculaceae	<i>Clematis lasiantha</i> Nutt.	native
Ranunculaceae	<i>Clematis ligusticifolia</i> Nutt.	native
Ranunculaceae	<i>Delphinium gracilentum</i> Greene	native
Ranunculaceae	<i>Delphinium hansenii</i> (Greene) Greene	native
Ranunculaceae	<i>Delphinium nuttallianum</i> Pritz.	native
Ranunculaceae	<i>Delphinium polycladon</i> Eastw.	native
Ranunculaceae	<i>Isopyrum occidentale</i> Hook. & Arn.	native
Ranunculaceae	<i>Kumlienia hystricula</i> (A. Gray) Greene	native
Ranunculaceae	<i>Ranunculus alismifolius</i> Benth. var. <i>alismellus</i> A. Gray	native
Ranunculaceae	<i>Ranunculus alismifolius</i> Benth. var. <i>alismifolius</i>	native
Ranunculaceae	<i>Ranunculus aquatilis</i> L. var. <i>capillaceus</i> (Thuill.) DC.	native
Ranunculaceae	<i>Ranunculus cymbalaria</i> Pursh var. <i>saximontanus</i> Fernald	native
Ranunculaceae	<i>Ranunculus eschscholtzii</i> Schldl. var. <i>oxynotus</i> (A. Gray) Jeps.	native
Ranunculaceae	<i>Ranunculus hebecarpus</i> Hook. & Arn.	native
Ranunculaceae	<i>Ranunculus occidentalis</i> Nutt.	native
Ranunculaceae	<i>Ranunculus parviflorus</i> L.	non-native
Ranunculaceae	<i>Ranunculus testiculatus</i> Crantz	non-native
Ranunculaceae	<i>Thalictrum fendleri</i> A. Gray var. <i>fendleri</i>	native
Ranunculaceae	<i>Thalictrum sparsiflorum</i> Fisch. & C.A. Mey.	native
Rhamnaceae	<i>Ceanothus cordulatus</i> Kellogg	native
Rhamnaceae	<i>Ceanothus cuneatus</i> (Hook.) Nutt.	native
Rhamnaceae	<i>Ceanothus diversifolius</i> Kellogg	native
Rhamnaceae	<i>Ceanothus integerrimus</i> Hook. & Arn. var. <i>californicus</i> (Kellogg) G. T. Benson	native
Rhamnaceae	<i>Ceanothus leucodermis</i> Greene	native
Rhamnaceae	<i>Ceanothus palmeri</i> Trel.	native
Rhamnaceae	<i>Ceanothus parvifolius</i> (S. Watson) Trel.	native
Rhamnaceae	<i>Ceanothus pinetorum</i> Coville	native

Rhamnaceae	Ceanothus velutinus Dougl. var. velutinus	native
Rhamnaceae	Rhamnus ilicifolia Kellogg	native
Rhamnaceae	Rhamnus rubra Greene	native
Rhamnaceae	Rhamnus tomentella Benth. ssp. cuspidata (Greene) Sawyer	native
Rhamnaceae	Rhamnus tomentella Benth. ssp. tomentella	native
Rosaceae	Adenostoma fasciculatum Hook. & Arn.	native
Rosaceae	Amelanchier alnifolia (Nutt.) Nutt. var. pumila (Nutt.) Nelson	native
Rosaceae	Amelanchier utahensis Koehne	native
Rosaceae	Aphanes occidentalis (Nutt.) Rydb.	native
Rosaceae	Cercocarpus betuloides Torr. & A. Gray	native
Rosaceae	Cercocarpus intricatus S. Watson	native
Rosaceae	Cercocarpus ledifolius Nutt. var. ledifolius	native
Rosaceae	Chamaebatia foliolosa Benth.	native
Rosaceae	Fragaria vesca L.	native
Rosaceae	Fragaria virginiana Duchesne	native
Rosaceae	Geum macrophyllum Willd.	native
Rosaceae	Heteromeles arbutifolia (Lindl.) M. Roem.	non-native
Rosaceae	Holodiscus microphyllus Rydb. var. microphyllus	native
Rosaceae	Horkelia tridentata Torr. ssp. tridentata	native
Rosaceae	Horkeliella congdoni (Rydb.) Rydb.	native
Rosaceae	Horkeliella purpurascens (S. Watson) Rydb.	native
Rosaceae	Ivesia campestris (M.E. Jones) Rydb.	native
Rosaceae	Ivesia gordonii (Hook.) Torr. & A. Gray	native
Rosaceae	Ivesia lycopodioides A. Gray ssp. megalopetala (Rydb.) D.D. Keck	native
Rosaceae	Ivesia lycopodioides A. Gray ssp. scandularis (Rydb.) D.D. Keck	native
Rosaceae	Ivesia muirii A. Gray	native
Rosaceae	Ivesia pygmaea A. Gray	native
Rosaceae	Ivesia santolinoides A. Gray	native
Rosaceae	Ivesia unguiculata A. Gray	native
Rosaceae	Malus sylvestris Mill.	non-native
Rosaceae	Oemleria cerasiformis (Hook. & Arn.) J.W. Landon	native
Rosaceae	Petrophyton caespitosum (Nutt.) Rydb. ssp. acuminatum (Rydb.) Munz	native
Rosaceae	Physocarpus capitatus (Pursh) Kuntze	native
Rosaceae	Potentilla diversifolia Lehm. var. diversifolia	native
Rosaceae	Potentilla drummondii Lehm. ssp. breweri (S. Watson) Ertter	native
Rosaceae	Potentilla drummondii Lehm. ssp. bruceae (Rydb.) D.D. Keck	native
Rosaceae	Potentilla drummondii Lehm. ssp. drummondii	native
Rosaceae	Potentilla flabellifolia Hook.	native
Rosaceae	Potentilla fruticosa L.	native

Rosaceae	Potentilla glandulosa Lindl. ssp. glandulosa	native
Rosaceae	Potentilla glandulosa Lindl. ssp. hansenii (Greene) D.D. Keck	native
Rosaceae	Potentilla glandulosa Lindl. ssp. nevadensis (S. Watson) D.D. Keck	native
Rosaceae	Potentilla glandulosa Lindl. ssp. pseudorupestris (Rydb.) D.D. Keck	native
Rosaceae	Potentilla glandulosa Lindl. ssp. reflexa (Greene) D.D. Keck	native
Rosaceae	Potentilla gracilis Hook. var. elmeri (Rydb.) Jeps.	native
Rosaceae	Potentilla gracilis Hook. var. fastigiata (Nutt.) S. Watson	native
Rosaceae	Potentilla grayi S. Watson	native
Rosaceae	Potentilla pensylvanica L. var. strigosa Pursh	native
Rosaceae	Potentilla pseudosericea Rydb.	native
Rosaceae	Potentilla wheeleri S. Watson	native
Rosaceae	Prunus emarginata (Hook.) Walp.	native
Rosaceae	Prunus subcordata Benth.	native
Rosaceae	Prunus virginiana L. var. demissa (Nutt.) Torr.	native
Rosaceae	Pyracantha angustifolia (Franchet) C.K. Schneid.	non-native
Rosaceae	Rosa bridgesii Crépin	native
Rosaceae	Rosa californica Cham. & Schldl.	native
Rosaceae	Rosa pinetorum A. Heller	native
Rosaceae	Rosa spithamea S. Watson	native
Rosaceae	Rosa woodsii Lindl. var. ultramontana (S. Watson) Jeps.	native
Rosaceae	Rubus discolor Weihe & Nees	non-native
Rosaceae	Rubus glaucifolius Kellogg	native
Rosaceae	Rubus leucodermis Torr. & A. Gray	native
Rosaceae	Rubus parviflorus Nutt.	native
Rosaceae	Rubus ursinus Cham. & Schldl.	native
Rosaceae	Sibbaldia procumbens L.	native
Rosaceae	Sorbus californica Greene	native
Rosaceae	Spiraea densiflora Torr. & A. Gray	native
Rubiaceae	Cephalanthus occidentalis L. var. californicus Benth.	native
Rubiaceae	Galium aparine L.	native
Rubiaceae	Galium bifolium S. Watson	native
Rubiaceae	Galium bolanderi A. Gray	native
Rubiaceae	Galium hypotrichium A. Gray ssp. subalpinum (Hilend & J.T. Howell) Ehrend.	native
Rubiaceae	Galium multiflorum Kellogg	native
Rubiaceae	Galium murale (L.) All.	non-native
Rubiaceae	Galium parisiense L.	non-native
Rubiaceae	Galium porrigens Dempster var. tenue (Dempster) Dempster	native
Rubiaceae	Galium sparsiflorum Wight ssp. sparsiflorum	native
Rubiaceae	Galium trifidum L. var. pacificum Wiegand	native

Rubiaceae	<i>Galium trifidum</i> L. var. <i>pusillum</i> A. Gray.	native
Rubiaceae	<i>Galium triflorum</i> Michx.	native
Rubiaceae	<i>Kelloggia galioides</i> Torr.	native
Rubiaceae	<i>Sherardia arvensis</i> L.	non-native
Salicaceae	<i>Populus balsamifera</i> L. ssp. <i>trichocarpa</i> (Torr. & A. Gray) Brayshaw	native
Salicaceae	<i>Populus fremontii</i> S. Watson ssp. <i>fremontii</i>	native
Salicaceae	<i>Populus tremuloides</i> Michx.	native
Salicaceae	<i>Salix arctica</i> Pall.	native
Salicaceae	<i>Salix boothii</i> Dorn	native
Salicaceae	<i>Salix drummondiana</i> Hook.	native
Salicaceae	<i>Salix eastwoodiae</i> A. Heller	native
Salicaceae	<i>Salix exigua</i> Nutt.	native
Salicaceae	<i>Salix gooddingii</i> C.R. Ball	native
Salicaceae	<i>Salix jepsonii</i> C.K. Schneid.	native
Salicaceae	<i>Salix laevigata</i> Bebb	native
Salicaceae	<i>Salix lasiolepis</i> Benth.	native
Salicaceae	<i>Salix lemmonii</i> Bebb	native
Salicaceae	<i>Salix ligulifolia</i> (C.R. Ball) C.R. Ball	native
Salicaceae	<i>Salix lucida</i> Muhlenb. ssp. <i>lasiandra</i> (Benth.) E. Murray	native
Salicaceae	<i>Salix melanopsis</i> Nutt.	native
Salicaceae	<i>Salix orestera</i> C.K. Schneid.	native
Salicaceae	<i>Salix planifolia</i> Cham. ssp. <i>planifolia</i>	native
Salicaceae	<i>Salix scouleriana</i> Hook.	native
Santalaceae	<i>Comandra umbellata</i> (L.) Nutt. ssp. <i>californica</i> (Rydb.) Piehl	native
Saururaceae	<i>Anemopsis californica</i> (Nutt.) Hook. & Arn.	native
Saxifragaceae	<i>Darmera peltata</i> (Torr.) Voss	native
Saxifragaceae	<i>Heuchera micrantha</i> Lindl. var. <i>erubescens</i> (A. Braun & Bouché) Rosend.	native
Saxifragaceae	<i>Heuchera rubescens</i> Torr. var. <i>alpicola</i> Jeps.	native
Saxifragaceae	<i>Heuchera rubescens</i> Torr. var. <i>rydbergiana</i> Rosend. et al.	native
Saxifragaceae	<i>Lithophragma bolanderi</i> A. Gray	native
Saxifragaceae	<i>Lithophragma glabrum</i> Nutt.	native
Saxifragaceae	<i>Lithophragma heterophyllum</i> (Hook. & Arn.) Torr. & A. Gray	native
Saxifragaceae	<i>Lithophragma parviflorum</i> (Hook.) Torr. & A. Gray	native
Saxifragaceae	<i>Mitella breweri</i> A. Gray	native
Saxifragaceae	<i>Mitella pentandra</i> Hook.	native
Saxifragaceae	<i>Parnassia californica</i> (A. Gray) Greene	native
Saxifragaceae	<i>Saxifraga aprica</i> Greene	native
Saxifragaceae	<i>Saxifraga bryophora</i> A. Gray	native
Saxifragaceae	<i>Saxifraga californica</i> Greene	native

Saxifragaceae	Saxifraga nidifica Greene var. nidifica	native
Saxifragaceae	Saxifraga odontoloma Piper	native
Saxifragaceae	Saxifraga oregana Howell	native
Saxifragaceae	Saxifraga rivularis L.	native
Saxifragaceae	Saxifraga tolmiei Torr. & A. Gray	native
Saxifragaceae	Tellima grandiflora (Pursh) Lindl.	native
Scrophulariaceae	Antirrhinum cornutum Benth.	native
Scrophulariaceae	Antirrhinum leptaleum A. Gray	native
Scrophulariaceae	Castilleja applegatei Fernald ssp. disticha (Eastw.) Chuang & Heckard	native
Scrophulariaceae	Castilleja applegatei Fernald ssp. pallida (Eastw.) Chuang & Heckard	native
Scrophulariaceae	Castilleja attenuata (A. Gray) Chuang & Heckard	native
Scrophulariaceae	Castilleja exserta (A. Heller) Chuang & Heckard ssp. exserta	native
Scrophulariaceae	Castilleja lemmonii A. Gray	native
Scrophulariaceae	Castilleja lineariloba (Benth.) Chuang & Heckard	native
Scrophulariaceae	Castilleja miniata Hook. ssp. miniata	native
Scrophulariaceae	Castilleja nana Eastw.	native
Scrophulariaceae	Castilleja tenuis (A. Heller) Chuang & Heckard	native
Scrophulariaceae	Collinsia childii A. Gray	native
Scrophulariaceae	Collinsia heterophylla Graham	native
Scrophulariaceae	Collinsia parviflora Lindl.	native
Scrophulariaceae	Collinsia sparsiflora Fisch. & C.A. Mey. var. collina (Jeps.) Newsom	native
Scrophulariaceae	Collinsia tinctoria Benth.	native
Scrophulariaceae	Collinsia torreyi A. Gray var. brevicarinata Newsom	native
Scrophulariaceae	Collinsia torreyi A. Gray var. torreyi	native
Scrophulariaceae	Collinsia torreyi A. Gray var. wrightii (S. Watson) I.M. Johnst.	native
Scrophulariaceae	Cordylanthus rigidus (Benth.) Jeps. ssp. brevibracteatus (A. Gray) Munz	native
Scrophulariaceae	Cordylanthus rigidus (Benth.) Jeps. ssp. rigidus	native
Scrophulariaceae	Digitalis purpurea L.	non-native
Scrophulariaceae	Keckiella breviflora (Lindl.) Straw var. breviflora	native
Scrophulariaceae	Keckiella breviflora (Lindl.) Straw var. glabrisepala (D.D. Keck) N.H. Holmgren	native
Scrophulariaceae	Keckiella rothrockii (A. Gray) Straw var. rothrockii	native
Scrophulariaceae	Limosella acaulis Sessé & Mociño	native
Scrophulariaceae	Limosella aquatica L.	native
Scrophulariaceae	Lindernia dubia (L.) Pennell var. anagallidea (Michx.) Cooperr.	native
Scrophulariaceae	Mimulus aurantiacus Curtis	native
Scrophulariaceae	Mimulus bicolor Benth.	native
Scrophulariaceae	Mimulus bolanderi A. Gray	native
Scrophulariaceae	Mimulus breweri (Greene) Coville	native

Scrophulariaceae	Mimulus cardinalis Benth.	native
Scrophulariaceae	Mimulus congdonii B.L. Rob.	native
Scrophulariaceae	Mimulus floribundus Lindl.	native
Scrophulariaceae	Mimulus guttatus DC.	native
Scrophulariaceae	Mimulus inconspicuus A. Gray	native
Scrophulariaceae	Mimulus kelloggii (Greene) A. Gray	native
Scrophulariaceae	Mimulus laciniatus A. Gray	native
Scrophulariaceae	Mimulus layneae (Greene) Jeps.	native
Scrophulariaceae	Mimulus leptaleus A. Gray	native
Scrophulariaceae	Mimulus lewisii Pursh	native
Scrophulariaceae	Mimulus mephiticus Greene	native
Scrophulariaceae	Mimulus montioides A. Gray	native
Scrophulariaceae	Mimulus moschatus Lindl.	native
Scrophulariaceae	Mimulus norrisii Heckard & Shevock	native
Scrophulariaceae	Mimulus palmeri A. Gray	native
Scrophulariaceae	Mimulus pilosus (Benth.) S. Watson	native
Scrophulariaceae	Mimulus primuloides Benth. ssp. primuloides	native
Scrophulariaceae	Mimulus suksdorfii A. Gray	native
Scrophulariaceae	Mimulus tilingii Regel	native
Scrophulariaceae	Mimulus torreyi A. Gray	native
Scrophulariaceae	Mimulus viscidus Congdon	native
Scrophulariaceae	Mimulus whitneyi A. Gray	native
Scrophulariaceae	Pedicularis attollens A. Gray	native
Scrophulariaceae	Pedicularis densiflora Hook.	native
Scrophulariaceae	Pedicularis groenlandica Retz.	native
Scrophulariaceae	Pedicularis semibarbata A. Gray	native
Scrophulariaceae	Penstemon azureus Benth. var. azureus	native
Scrophulariaceae	Penstemon caesius A. Gray	native
Scrophulariaceae	Penstemon davidsonii Greene var. davidsonii	native
Scrophulariaceae	Penstemon grinnellii Eastw. var. scrophularioides (M.E. Jones) N.H. Holmgren	native
Scrophulariaceae	Penstemon heterodoxus A. Gray var. cephalophorus (Greene) N.H. Holmgren	native
Scrophulariaceae	Penstemon heterodoxus A. Gray var. heterodoxus	native
Scrophulariaceae	Penstemon laetus A. Gray var. laetus	native
Scrophulariaceae	Penstemon newberryi A. Gray var. newberryi	native
Scrophulariaceae	Penstemon parvulus (A. Gray) Krautter	native
Scrophulariaceae	Penstemon rostriflorus Kellogg	native
Scrophulariaceae	Penstemon rydbergii Nelson var. oreocharis (Greene) N.H. Holmgren	native
Scrophulariaceae	Scrophularia californica Cham. & Schldl. ssp. floribunda (Greene) R.J.	native

	Shaw	
Scrophulariaceae	Scrophularia desertorum (Munz) R.J. Shaw	native
Scrophulariaceae	Triphysaria eriantha (Benth.) Chuang & Heckard	native
Scrophulariaceae	Verbascum thapsus L.	non-native
Scrophulariaceae	Verbascum virgatum Stokes	non-native
Scrophulariaceae	Veronica americana (Raf.) Benth.	native
Scrophulariaceae	Veronica arvensis L.	non-native
Scrophulariaceae	Veronica peregrina L. ssp. xalapensis (Kunth) Pennell	native
Scrophulariaceae	Veronica persica Poiret	non-native
Scrophulariaceae	Veronica serpyllifolia L. ssp. humifusa (Dickson) Syme	native
Scrophulariaceae	Veronica wormskjoldii Roem. & Schult.	native
Selaginellaceae	Selaginella hansenii Hieron.	native
Selaginellaceae	Selaginella watsonii L. Underw.	native
Solanaceae	Datura wrightii Regel	native
Solanaceae	Nicotiana attenuata Torr.	native
Solanaceae	Physalis philadelphica Lam.	non-native
Solanaceae	Solanum americanum Mill.	native
Solanaceae	Solanum xanti A. Gray	native
Staphyleaceae	Staphylea bolanderi A. Gray	native
Sterculiaceae	Fremontodendron californicum (Torr.) Coville ssp. californicum	native
Taxaceae	Torreya californica Torr.	native
Taxodiaceae	Sequoiadendron giganteum (Lindl.) Buchholz	native
Typhaceae	Sparganium angustifolium Michx.	native
Typhaceae	Sparganium emersum Rehmann ssp. emersum	native
Typhaceae	Typha domingensis Pers.	native
Typhaceae	Typha latifolia L.	native
Urticaceae	Hesperocnide tenella Torr.	native
Urticaceae	Parietaria hespera Hinton	native
Urticaceae	Urtica dioica L. ssp. holosericea (Nutt.) Thorne	native
Urticaceae	Urtica urens L.	non-native
Valerianaceae	Plectritis ciliosa (Greene) Jeps.	native
Valerianaceae	Valeriana californica A. Heller	native
Verbenaceae	Phyla nodiflora (L.) Greene var. nodiflora	native
Verbenaceae	Verbena lasiostachys Link	native
Violaceae	Viola adunca Sm.	native
Violaceae	Viola glabella Nutt.	native
Violaceae	Viola lobata Benth. ssp. lobata	native
Violaceae	Viola macloskeyi F.E. Lloyd	native
Violaceae	Viola pinetorum Greene ssp. pinetorum	native
Violaceae	Viola purpurea Kellogg ssp. integrifolia M.S. Baker & J.C. Clausen	native

Violaceae	<i>Viola purpurea</i> Kellogg ssp. <i>purpurea</i>	native
Violaceae	<i>Viola purpurea</i> Kellogg ssp. <i>quercetorum</i> (M.S. Baker & J.C. Clausen) R.J. Little	native
Violaceae	<i>Viola sheltonii</i> Torr.	native
Viscaceae	<i>Arceuthobium abietinum</i> (Engelm.) Hawksw. & Wiens	native
Viscaceae	<i>Arceuthobium americanum</i> Engelm.	native
Viscaceae	<i>Arceuthobium campylopodum</i> Engelm.	native
Viscaceae	<i>Phoradendron densum</i> Trel.	native
Viscaceae	<i>Phoradendron juniperinum</i> A. Gray	native
Viscaceae	<i>Phoradendron libocedri</i> (Engelm.) Howell	native
Viscaceae	<i>Phoradendron macrophyllum</i> (Engelm.) Cockerell	native
Viscaceae	<i>Phoradendron pauciflorum</i> Torr.	native
Viscaceae	<i>Phoradendron villosum</i> (Nutt.) Nutt.	native
Vitaceae	<i>Ampelopsis arborea</i> (L.) Koehne	non-native
Vitaceae	<i>Parthenocissus vitacea</i> (Knerr) Hitchc.	native
Vitaceae	<i>Vitis californica</i> Benth.	native
Zygophyllaceae	<i>Tribulus terrestris</i> L.	non-native

Appendix U – Verify Potentially New Taxa to the Vascular Plant Species Checklist of Sequoia and Kings Canyon National Parks residing in regional herbaria

This table contains a list of 73 potential new taxa to the parks vascular plant species checklist housed within regional herbaria. Taxa collected within Sequoia and Kings Canyon National Parks new to the parks checklist were noted while evaluating specimen records provided by regional herbaria. Specimens representing these taxa will need to be located, identified and verified by comparison with holdings at regional herbaria. It is important to note, that specimens representing taxa on this list may have been misidentified and actually represent taxa already on the parks checklist (names in bold represent suspect identifications).

The following lists the specimen's location corresponding to the repositories acronym in the field SpecimenID:

<u>Herbarium Acronym:</u>	<u>Location:</u>
FSC	Fresno State College Herbarium at California State University, Fresno
JEPS	Jepson Herbarium at the University of California, Berkeley
SJSU	Carl W. Sharsmith Herbarium at San Jose State University, San Jose
THRI	Sequoia and Kings Canyon National Parks Herbarium, Three Rivers (SEKI)
UC	University Herbarium at the University of California, Berkeley
DAV	University of California Davis Herbarium at the University of California, Davis

Table 10: Potential New Taxa residing in Regional Herbaria

Family	Taxon	SpecimenID
Apiaceae	<i>Osmorhiza occidentalis</i> (Nutt.) Torr.	SJSU-2141
Asteraceae	<i>Antennaria rosea</i> Greene ssp. <i>rosea</i>	FSC-28925
Asteraceae	<i>Aster foliaceus</i> Lindl. var. <i>parryi</i> (Eaton) A.	DAV-23283

	Gray	
Asteraceae	<i>Ericameria cuneata</i> (A. Gray) McClatchie var. <i>cuneata</i>	JEPS19169, JEPS19178, JEPS34265, UC1118704, UC1118706, UC1564061, UC63163, UC669357
Asteraceae	<i>Erigeron barbellulatus</i> Greene	UC87519
Asteraceae	<i>Erigeron compactus</i> S.F. Blake	UC1215509, UC712600, UC712601
Asteraceae	<i>Erigeron inornatus</i> A. Gray var. <i>inornatus</i>	UC55126
Asteraceae	<i>Erigeron strigosus</i> Willd.	DAV-22785
Asteraceae	<i>Gnaphalium canescens</i> DC. ssp. <i>thermale</i> (E.E. Nelson) Stebb. & D.J. Keil	JEPS16651, JEPS57838, SJSU2970, UC1118250, UC472346
Asteraceae	<i>Machaeranthera canescens</i> (Pursh) A. Gray var. <i>canescens</i>	UC669335
Asteraceae	<i>Micropus californicus</i> Fisch. & C.A. Mey. var. <i>californicus</i>	JEPS40643
Asteraceae	<i>Pericome caudata</i> A. Gray	UC85453
Asteraceae	<i>Petradoria pumila</i> (Nutt.) Greene ssp. <i>pumila</i>	UC1564068
Asteraceae	<i>Solidago spectabilis</i> (D.C. Eaton) A. Gray	DAV-22814
Boraginaceae	<i>Plagiobothrys stipitatus</i> (Greene) I.M. Johnst.	UC205049
Crassulaceae	<i>Dudleya cymosa</i> (Lemaire) Britton & Rose ssp. <i>cymosa</i>	SEKI 19866, SEKI 19936
Cupressaceae	<i>Juniperus californica</i> Carrière	UC1564207
Cuscutaceae	<i>Cuscuta salina</i> Engelm.	UC124476
Cyperaceae	<i>Carex hassei</i> L.H. Bailey	UC1149744
Cyperaceae	<i>Carex sartwelliana</i> Olney	UC1149876
Cyperaceae	<i>Carex serratodens</i> W. Boott	UC830133
Cyperaceae	<i>Scirpus cernuus</i> Vahl	UC841150
Cyperaceae	<i>Scirpus diffusus</i> Schuyler	UC674765
Ericaceae	<i>Arctostaphylos pungens</i> Kunth	UC214415
Fabaceae	<i>Lupinus microcarpus</i> Sims var. <i>densiflorus</i> (Benth.) Jeps.	UC1514488
Fagaceae	<i>Lithocarpus densiflorus</i> (Hook. & Arn.) Rehder	UC1565073, UC1565078
Garryaceae	<i>Garrya fremontii</i> Torr.	UC1324038
Grossulariaceae	<i>Ribes cereum</i> Douglas var. <i>cereum</i>	UC1736499
Hydrophyllaceae	<i>Phacelia californica</i> Cham.	UC126065
Hydrophyllaceae	<i>Phacelia distans</i> Benth.	JEPS2382
Hydrophyllaceae	<i>Phacelia quickii</i> J.T. Howell	UC133060
Hydrophyllaceae	<i>Phacelia ramosissima</i> Lehm. var. <i>austrolitoralis</i> Munz	UC107405
Hydrophyllaceae	<i>Phacelia ramosissima</i> Lehm. var. <i>latifolia</i>	UC1565066, UC1565158

	(Torr.) Cronquist	
Hydrophyllaceae	Phacelia ramosissima Lehm. var. subglabra M. Peck	JEPS1344, UC63349, UC702981
Hydrophyllaceae	Phacelia tanacetifolia Benth.	JEPS1283
Hydrophyllaceae	Phacelia vallis-mortae J. Voss	UC1514492
Juncaceae	Juncus bufonius L. var. congestus Wahlenb.	UC984844
Juncaceae	Juncus dubius Engelm.	UC1149770
Juncaceae	Juncus xiphioides E. Mey.	UC198476
Loasaceae	Mentzelia lindleyi Torr. & A. Gray	UC1540323
Loasaceae	Mentzelia montana (Davidson) Davidson	UC1540266
Malvaceae	Malacothamnus fasciculatus (Torr. & A. Gray) Greene	UC1122038, UC527374
Menyanthaceae	Menyanthes trifoliata L.	JEPS20794
Onagraceae	Camissonia subacaulis (Pursh) P.H. Raven	UC721983
Orchidaceae	Platanthera stricta Lindl.	JEPS64454
Polemoniaceae	Eriastrum densifolium (Benth.) H. Mason ssp. austromontanum (Craig) H. Mason	UC1123859
Polemoniaceae	Gilia capitata Sims ssp. capitata	UC1397127
Polemoniaceae	Gilia capitata Sims ssp. mediomontana V.E. Grant	UC1564095
Polemoniaceae	Gilia capitata Sims ssp. pedemontana V.E. Grant	JEPS69563
Polemoniaceae	Gilia leptalea (A. Gray) Greene ssp. leptalea	FSC-27325
Polemoniaceae	Navarretia divaricata (A. Gray) Greene ssp. divaricata	FSC-31598
Polypodiaceae	Polypodium calirhiza S.A. Whitmore & A.R. Sm.	UC1063658, UC43118, UC62428
Portulacaceae	Claytonia parviflora Hook. ssp. parviflora	JEPS43301
Portulacaceae	Claytonia perfoliata Willd. ssp. intermontana John M. Mill. & K.L. Chambers	UC1564211, UC1564994, UC452680
Pteridaceae	Pellaea x glaciogena W. H. Wagner	UC1178417
Ranunculaceae	Delphinium andersonii A. Gray	JEPS2556
Rhamnaceae	Ceanothus cuneatus (Hook.) Nutt. var. cuneatus	UC1324066, UC1558433, UC1558452
Rhamnaceae	Rhamnus californica Eschsch. ssp. californica	UC1324037
Rosaceae	Cercocarpus ledifolius Nutt. X Cercocarpus betuloides Torr. & A. Gray	SEKI 13320
Salicaceae	Salix geyeriana Andersson	UC721881, UC724933
Salicaceae	Salix prolixa Andersson	UC481752
Scrophulariaceae	Castilleja applegatei Fernald ssp. pinetorum	JEPS16365, JEPS21481, JEPS33822,

	(Fernald) Chuang & Heckard	JEPS57201, JEPS57475, JEPS81694, JEPS9049, UC1063045, UC1215055, UC126460, UC198497, UC421163
Scrophulariaceae	Castilleja pilosa (S. Watson) Rydb.	JEPS16318, JEPS16321
Scrophulariaceae	Castilleja praeterita Heckard & Bacigal.	JEPS6951, JEPS6952, JEPS7055
Scrophulariaceae	Castilleja subinclusa Greene	UC1558418
Scrophulariaceae	Collinsia bartsiiifolia Benth. var. davidsonii (Parish) Newsom	JEPS6313
Scrophulariaceae	Cordylanthus tenuis A. Gray	SJSU-13588
Scrophulariaceae	Mimulus constrictus (A.L. Grant) Pennell	JEPS2993, JEPS57902, JEPS5793, JEPS86959, UC1063566, UC1564163
Scrophulariaceae	Mimulus primuloides Benth. ssp. linearifolius (A.L. Grant) Munz	UC125191
Scrophulariaceae	Penstemon grinnellii Eastw. var. grinnellii	JEPS14297
Scrophulariaceae	Penstemon speciosus Lindl.	JEPS11388
Urticaceae	Parietaria hespera Hinton var. hespera	JEPS82025
Valerianaceae	Plectritis ciliosa (Greene) Jeps. ssp. ciliosa	JEPS5152