

Ms. Marie Bruegmann  
41-555A Hihimanu Street  
Waimanalo, Hawaii 96795

Senator Laura H. Thielen  
Chair, Senate Committee on Water and Land  
The Senate  
State Capitol  
Honolulu, Hawaii 96813

April 9, 2015

Dear Senator Thielen:

Re: Governor's Message No. 705, Marie Bruegmann  
Academic Degree in Botany  
Natural Area Reserves System Commission  
Expiration Date: June 30, 2018

Thank you for considering me to serve a second term on the Natural Area Reserves System (NARS) Commission. To assist the Senate with its constitutionally mandated responsibility to confirm gubernatorial nominees, below are my responses to the questions you provided to be submitted as part of my testimony.

- (1) Why do you wish to be a member of the Natural Area Reserves System Commission?  
I believe that my experience studying and working in Hawaiian plant conservation for the last 33 years would continue to benefit the NARS Commission, particularly regarding issues that relate to plant conservation. I participate in several strategic conservation planning efforts, including the Hawaii and Pacific Rare Plant Recovery Coordinating Committee (as chairperson), which is developing a Hawaiian rare plant conservation strategy; reintroduction protocol development; co-chair the Hawaii Rare Plant Restoration Group which is also the IUCN Hawaii Plant Specialist Group; and on-the-ground management for 11 listed plants in the Alakai Wilderness Area. I am also a member of the Center for Plant Conservation's Science Advisory Council and Science Advisory Group of the Hawaiian Silversword Foundation. This array of experiences provides me with a strong background to advise the Natural Area Reserves staff on botanical conservation issues. I have enjoyed my last 4 years on this Commission, but feel I have only been able to scratch the surface of the challenges the NARS. I hope to continue helping guide the direction of the NARS to be efficient and effective at the protection and management of the unique natural resources under their jurisdiction.

- (2) How do you perceive the role and responsibilities of a member of the Natural Area Reserves System Commission?

As vice chair, if approved I plan to continue conducting meetings any time the chair is not available. Also if approved, I look forward to continuing to provide technical advice to the NARS staff on issues as divergent as the value of and protocols for rare plant reintroduction on NARS lands, when a particular NAR should be closed to the public for safety or for natural resources management, and how to best manage the NARS for the natural resources. I believe my background working with many different partners to achieve plant conservation in Hawaii places me in an ideal position to work collaboratively with the other members of the Commission and the NARS staff to protect Hawaii's unique resources.

- (3) What do you hope to accomplish during your term of service?

As vice chair, I will conduct meetings any time the chair is not available. One of my primary goals for this term, as a member of the committee reviewing the Natural Area Partnership Program (NAPP), is to provide a critical review of the NAPP and recommendations for improvements moving forward with the program. I also hope to continue working with other Commission members to solve challenges as they arise within the NARS.

- (4) Is there any other information regarding your experience and background that you believe should be considered by the committee?

In addition to 22 years at the U.S. Fish and Wildlife Service, I received my master's degree in botany at the University of Hawaii; worked for 4 years with The Nature Conservancy's Hawaii Heritage Program surveying and developing management plans for the NARS, among other duties, and worked for the national Center for Plant Conservation as a conservation project coordinator for Hawaii and 4 other high priority plant conservation sites. I believe that my experience in Hawaii and elsewhere suits me well to continue as the botanical expertise representative on the NARS Commission.

Thank you for considering me for this continued commission. If you have any additional information requests, you can reach me 808-792-9412 or [marie\\_bruegmann@fws.gov](mailto:marie_bruegmann@fws.gov).

Sincerely,

Signed Marie M. Bruegmann

## Marie M. Bruegmann

### WORK EXPERIENCE

***PLANT RECOVERY COORDINATOR***, December 15, 2000 to present

U.S. Fish and Wildlife Service

Pacific Islands Fish and Wildlife Office

GENERAL: As the plant recovery coordinator for the U.S. Fish and Wildlife Service (Service), I oversee all aspects of plant recovery in Hawaii and the Pacific. I serve as the principle contact and liaison for the Service partnering with other agencies, organizations, native Hawaiian and Pacific Island groups, private interest groups, and the public to develop and implement recovery programs to further the conservation and management of Hawaiian and Pacific plants, as well as develop guidelines and protocols for plant recovery actions. I am the current chair of the Hawaii and Pacific Plants Recovery Coordinating Committee (HPPRCC), a recovery team advising the Service on plant recovery issues. I provide botanical expertise to other programs of the Service regarding listing, critical habitat designations, and consultations with Federal agencies. I act for the Recovery/Partners Program lead when he/she is out of the office, which I have done for 5 months in the past year with a temporary GS13 salary, while the position was empty.

RECOVERY IMPLEMENTATION AND TRACKING (70%): I currently oversee the implementation of a plant extinction prevention program for plant species close to extinction. I participate with several partners to implement recovery efforts for two species of silverswords on the island of Hawaii. I continue to implement recovery actions for 11 plant species in Kauai montane bogs, as well as a monitoring program to ensure that management efforts are effective, working closely with my State partners. I provide technical expertise to numerous staff within the office as well as to partners outside the office on recovery planning and implementation projects. I also am responsible for tracking the recovery progress and ensuring quality production of approximately 100 5-year reviews annually and annual reports for 319 listed plants.

CONSERVATION PLANNING (30%): I currently participate in the assessment and development of models to determine the amount of area each species needs to achieve recovery. I am in the process of developing an online, dynamic recovery database that will allow continued updating as new information becomes available and as recovery actions are implemented. This prototype database addresses all recovery actions needed for all listed and candidate species on a given island, and will allow searches for only particular species, specific recovery actions for a given threat or a given area, etc. I participate in national-level development of a plant conservation strategy to bring plants more to the forefront of USFWS awareness, as well as national reviews of recovery planning and implementation to ensure that Hawaii's specific recovery issues are not overlooked in national guidance. I have recently been appointed the regional point of contact to the Plant Conservation Alliance.

PRELISTING (2%): I review the list of candidate species annually to determine if the status of the species has changed to warrant adding or deleting species from the list and provide this input to the listing and candidate program. I provide technical advice to the listing program on projects to implement recovery actions on candidate species and species of concern.

INTERAGENCY CONSULTATIONS (3%): I provide botanical expertise in section 7 consultations with other Federal agencies to ensure compliance with the Endangered Species Act and to assist these agencies with recovery actions.

SPECIFIC ACCOMPLISHMENTS:

- Chair of the Hawaii and Pacific Plant Recovery Coordinating Committee, providing plant recovery advice to the Service, including guidelines for plant recovery objectives.
- Co-chair of Hawaii Rare Plant Restoration Group, which is also the Hawaiian Plant Specialist Group for IUCN, developing protocols and implementation strategy for collection, storage, propagation, and reintroduction of endangered and threatened species. This included participating in the IUCN Species Survival Commission Specialist Group Chairs meeting in Abu Dhabi in 2012, where I gave a presentation on the Plant Extinction Prevention Program.
- Co-chair of the Mid-Elevation Steering Committee for mid-elevation rare plant propagation facilities, providing opportunities to develop protocols for sanitation, genetic founder representation, and sharing from lessons learned.
- Vice-chair Hawaii Division of Forestry and Wildlife's Natural Area Reserves Commission, and member of the commission's committee conducting the 20-year review of the Natural Areas Partnership Program.
- Development and implementation of vegetation and rare plant monitoring of a prelisting recovery effort for montane bogs on Kauai to prevent the need to list seven plant species.
- Maintain an endangered species tracking database system to monitor the status, threats, and listing and recovery progress of over 600 endangered, threatened, and at-risk Hawaii and Pacific plant species. Also maintain the list of accepted taxonomy for plant species in Hawaii.
- Provide botanical and ecological expertise to other biologists and program leaders within the Pacific Islands Office.
- Informally mentor the two island team recovery botanists, and meet with them monthly to discuss plant recovery issues and how best to approach them.
- Compiled the endangered species expenditures report for the Pacific Islands Fish and Wildlife Office for fiscal year 2013.
- Actively participate on committee ranking proposals for recovery, prelisting, and partners funding from the Pacific Islands Office.
- Volunteered with colleague to develop a reorganization of the Pacific Islands Fish and Wildlife Office server to match the new office reorganization and to oversee the completion of the server reorganization.

***FISH AND WILDLIFE BIOLOGIST***, May 02, 1993 to December 14, 2000

U.S. Fish and Wildlife Service  
Pacific Islands Office

**GENERAL:** As a biologist for the U.S. Fish and Wildlife Service, I participated in all aspects of the Service's activities, focusing on plant recovery and ecosystem conservation planning and implementation, as well as regulatory aspects of the Service. I was a member of the Hawaii and Pacific Plant Recovery Coordinating Committee, the recovery team advising the Service on plant recovery planning and implementation.

**RECOVERY IMPLEMENTATION (30%):** I designed and implemented recovery actions for seven plant species in Kauai montane bogs, as well as a monitoring program to ensure that management efforts are effective. I worked with several partners to implement recovery efforts for two species of silverswords on the island of Hawaii. I provided technical expertise to numerous staff within the office as well as to partners outside the office on recovery planning and implementation projects.

**CONSERVATION PLANNING (25%):** Participated in conservation planning efforts, including an ecosystem plan for the Service, a Hawaiian rare plant conservation strategy, reintroduction protocols, a plant restoration strategy for National Wildlife Refuges on the island of Kauai, a vegetation monitoring workshop to assist land managers in making management decisions, and an implementation plan for a Federal consultation involving efforts to stabilize 30 species.

**PARTNERSHIPS (15%):** Participated in a partnership for dry forest restoration and endangered species recovery in the North Kona area of the island of Hawaii. Also worked with private landowners in two other regions of North Kona to protect remnant dry forest parcels and recovery the endangered species found there. Moderated a dry forest restoration panel at the Hawaii Conservation Conference to share information from the North Kona dry forest project with other restoration projects, and am now working with panel members to develop a status report and web page to make information sharing an ongoing effort.

**LISTING (15%):** Conducted field studies and literature reviews to obtain data on the status, life history requirements, habitat preferences, and threats to various endangered and threatened species. Prepared listing documents for proposed and final rules using the data and information collected. Analyzed data and evaluate effect of recommendations on endangered species listing. Developed and maintained a tracking system on endangered and threatened species and species of concern.

**INTERAGENCY CONSULTATIONS (10%):** Participated in section 7 consultations with other Federal agencies, including Environmental Protection Agency, Federal Highways Administration, National Park Service, and U.S. Army, to ensure compliance with the Endangered Species Act and to assist these agencies with recovery actions.

**PUBLIC EDUCATION (5%):** Provided information and presentations on endangered species and their habitats when requested by the public.

#### **SPECIFIC ACCOMPLISHMENTS:**

- Active member of Hawaii and Pacific Plant Recovery Coordinating Committee, developing essential plant recovery habitat maps and a plant conservation strategy for Hawaii, at the request of the Service.
- Participated in dry forest restoration group to determine methods of dry forest restoration that can be applied to large-scale efforts.
- Member of Hawaii Rare Plant Restoration Group, developing protocols and implementation strategy for collection, storage, propagation, and reintroduction of endangered and threatened species.
- Participated in the development of plan for conservation in Hawaii and the Pacific that addresses ecosystem level threats.
- Development and implementation of vegetation and rare plant monitoring of a prelisting recovery effort for montane bogs on Kauai to prevent the need to list seven plant species.
- Member of an implementation planning team to develop adequate measures to stabilize 30 endangered plant species to allow the Army to continue training in Makua Military Reservation. Participation includes developing overall protocols for collection, propagation, and reintroduction in line with current conservation biology principles and techniques, as well as identifying specific actions to be implemented for each species.
- Wrote seven proposed rules for 85 plant species and 16 final rules for 127 plant species, including assessment of data, notification to landowners, and public notices.
- Provided technical review of recovery plans for 127 plant species, including review of data for accuracy and providing recovery recommendations.
- Developed and maintained an endangered species tracking database system to monitor the status, threats, and listing and recovery progress of over 500 Hawaii and Pacific plant species. Also, maintained the list of accepted taxonomy for plant species in Hawaii.
- Participated in interagency consultations for compliance with the Endangered Species Act for two large development projects and programmatic consultation for all Army lands in Hawaii.
- Provided botanical and ecological expertise to other biologists and program leaders within the Pacific Islands Ecoregion.

**CONSERVATION PROJECTS COORDINATOR**, September, 11, 1991 to April 23, 1993

Center for Plant Conservation  
Missouri Botanical Garden

**GENERAL:** As the Conservation Projects Coordinator, I assisted the Conservation Program Manager at the Center for Plant Conservation (CPC) in coordinating integrated conservation activities which involved cooperators throughout the United States working in rare plant conservation.

**PRIORITY REGION PROGRAM (50%):** Completed logistics and assisted with planning for annual task force meetings which brought together experts in endangered plant biology in the five areas of the country with the highest numbers of endangered plants, including Hawaii. The goal of these task forces was to compile the most current data on rare and endangered plant numbers and threats, and to recommend and begin to implement the conservation and resource management measures needed to recovery the species. Following each meeting I compiled a summary report presenting the latest data on plant numbers and threats, summary statistics, and recommendations to Federal and State agencies. These recommendations included plants to consider for candidate listing and those candidate species for which status reports were necessary before listing could be completed. I also conducted audits of cooperating botanical gardens in the priority areas to ensure that controlled propagation conservation work on endangered plants was conducted following the best conservation practices and was completed in partnership with other agencies and organizations.

**COOPERATIVE AGREEMENTS AND RESEARCH GRANTS (30%):** Assisted with the administration of cooperative agreements with government agencies and research grants from various foundations involving biological research or conservation activities conducted by biologists, researchers, or cooperating CPC gardens. Administration included overseeing budgets, drafting proposals, reviewing proposals for endangered plant biological research or recovery efforts and matching them to appropriate grants from foundations, and writing project reports.

**FIELD SURVEYS (5%):** Conducted field surveys with cooperating botanical gardens to locate endangered plant populations, assess habitat requirements and resource management needs, and collect genetically representative propagation materials for controlled propagation conservation efforts. Ensured cooperating gardens had appropriate government permits to collect endangered plant material.

**PUBLIC EDUCATION (15%):** Provided information on endangered plants when requested by public. Presented talks to public audiences on CPC's endangered plant program and on endangered plants in the US.

**SPECIFIC ACCOMPLISHMENTS:**

- Developed and wrote a large portion of a proposal for conserving the endangered plants of Hawaii, which was aimed at expediting interagency cooperation, eliminating duplication of efforts, and ensuring a comprehensive approach to the conservation of the many endangered and threatened plants in Hawaii. The proposal was used to obtain funding from a major private foundation.
- Assisted in planning and conducting task force meetings and compiling the summary reports for Hawaii, California, Texas, Florida, and Puerto Rico.
- Conducted field surveys in Puerto Rico, Texas, and Hawaii to locate populations of rare and endangered plants; collect data on numbers, threats, and habitat requirements; collect propagation materials for controlled propagation conservation and recovery efforts; and assess the success of reintroduction actions as part of the recovery efforts for endangered plants.
- Wrote a draft recovery plan for an endangered Hawaiian fern, *Marsilea villosa*.

- Composed letters of comment on over 150 endangered or threatened plant species to the Fish and Wildlife Service, including responses to requests for information, status reviews, proposed rules, and draft recovery plans for the Conservation Program Manager's signature. The letters included support for listing of the endangered or threatened species, review of the biological data for accuracy, and recommendations for the use of controlled propagation conservation to enhance recovery efforts.
- Commented on the 1992 Notice of Review for plants, including recommendations of plants to add to the candidate list, based on an analysis of the data available at CPC.
- Conducted audits of 10 cooperating botanical gardens to ensure that conservation work on endangered plants was conducted using scientific methods and was done in cooperation with other agencies and organizations.
- Administered the Beattie Fellowship from the Garden Club of America (GCA), which provides \$5,000 to a graduate student each year to conduct research on the biology, horticultural needs, or resource management needs of endangered plants. I sent out announcements and schedules, reviewed proposals, recommended the most qualified proposal to GCA, and compiled the reports.
- Administered a cooperative agreement with US. Department of Agriculture (USDA) which provided USDA with endangered plants for testing biological control agents' host specificities. Worked with cooperating gardens to supply plants to USDA and kept government application records and payments up to date.
- Completed the majority of the planning and all of the logistics for CPC's Restoring Diversity Symposium, a conference to address the scientific and policy issues of the use of reintroduction in rare plant conservation.

***HAWAII HERITAGE PROGRAM BOTANIST/RESEARCH ASSISTANT/ECOSYSTEM INTERN***, October 1987 to September 1991

The Nature Conservancy of Hawaii

**GENERAL:** Staff botanist responsible for the botanical aspects of the Hawaii Heritage Program (HHP), including development of the botanical portions of the Hawaiian rare species and ecosystem database and the completion of botanical portions of contracts to assess biological value of surveyed land parcels, overseeing a staff of four to five people. This position was a promotion from botanical research assistant, which I held for one year. In the latter position, I assisted with populating the botanical portion of the HHP database and assisted with Hawaiian ecosystem classification and field surveys. Prior to this, I was an ecosystem conservation intern, in which position I assisted in compiling the ecological portion of the HHP database and assisted with the Hawaiian ecosystem classification and field surveys, and assisted with the production of database reports and drafting ecological portions of contract reports.

**DATABASE (60%):** My primary duty was the development of the botanical portion of the Hawaiian rare element (plants, animals, ecosystems) database. Evaluating available data and recommendations, I maintained a list of over 500 rare and endangered Hawaiian plant species for inclusion in the HHP database. My responsibilities included overseeing literature searches, contacting experts on specific species, and reviews of available data to map all known populations and to compile and enter data on location, habitat, threats, and population status into the database for rare and endangered Hawaiian plants, following the standard methodology devised by the national office of The Nature Conservancy. I also streamlined the database process and maintained records on which plants had been mapped statewide and were current, which had additional data to be entered, and ensured that all available information was entered into the database for areas covered by contracts with government and private landowners.

**FIELD SURVEYS (10%):** Conducted the botanical portions of surveys to locate rare plants and animals and to map native vegetation. These surveys involved reviewing available information and aerial photographs to locate transects so as to sample the greatest diversity of ecosystems and the areas least known biologically. The

botanical survey involved recording plant species associated with each ecosystem as well as resource management information on habitat, threats, and numbers in each life stage for rare plant populations encountered during the survey.

**REPORTS (20%):** Scheduled botanical portions of contract deadlines, oversaw production of database reports and wrote botanical portions of contract reports. These reports included detailed descriptions of the rare plants, rare animals, and ecosystems found on lands surveyed, as well as resource management recommendations to preserve areas of biological significance.

**SUPERVISION (25%):** Hired, supervised, and evaluated performances of four to five botanical staff, including an assistant botanist and three to four botanical research assistants. In addition, I frequently supervised one or more volunteers who assisted with mapping, database editing, and filing.

**PUBLIC EDUCATION (5%):** Presented seminars and provided information on endangered and native Hawaiian plants and ecosystems to various scientific and public groups and individuals.

#### **SPECIFIC ACCOMPLISHMENTS:**

- Supervised completion of the first phase of the database development for over 500 rare Hawaiian plant species, which included mapping and compiling database records on all available information.
- Conducted botanical field surveys for areas on Oahu, Maui, and Hawaii.
- Developed a tracking system to monitor progress on mapping and database entry for over 500 rare and endangered Hawaiian plants, which was then converted for zoology and ecosystem branches as well.
- Developed a computer program to input data directly into the standard computer format, rather than hand transcribing data first.
- Developed a computer program to generate rare species tables and counts for given parcels of land directly from the database rather than creating tables and counts manually from maps.
- Developed a computer program to generate species lists for each ecosystem encountered on a survey.
- Completed final reviews and edits of 26 contract reports and database reports to ensure consistency and accuracy.
- Presented a seminar on the classification of Hawaiian ecosystems at the 1991 American Institute for Biological Sciences (AIBS) Conference.
- Presented results of research on the life history requirements and tissue water relations of the endangered Hawaiian fern, *Marsilea villosa*, at the 1989 AIBS Conference.

#### **SUMMARY OF POSITIONS, 1977 through 1987**

**STEWARDSHIP INTERN (1987):** Compiled biological inventories, text and maps for preserve designs and government permit applications for The Nature Conservancy. Assisted in biological monitoring programs, including pig and deer exclusion plots on Molokai.

**CONSULTANT (1986):** Contracted by the National Park Service's Cooperative Parks Studies Unit to compile National Natural Landmark Designation reports for 15 Hawaiian ecosystems, including summary of known sites, selection of premier examples, and management recommendations. Preparation included site surveys, literature searches, interviews with experts, and analysis of data to determine most suitable and intact representative of each ecosystem type.

**TEACHING ASSISTANT (1980-1986):** Prepared and taught labs in introductory botany, Hawaiian natural history, computer analysis of biological data, plant anatomy, general biology, and introductory and intermediate plant taxonomy at University of Hawaii and Michigan State University.



GREENHOUSE SUPERVISOR (1978-1981): Supervised organization and maintenance of Michigan State University tropical teaching greenhouse.

FIELD SURVEY VOLUNTEER (1977-1981): Volunteered with Michigan Natural Features Inventory to collect site survey summary data for rare plant locations in all of Berrien County, including searches for existing data in literature and local herbaria for historic sites to survey, as well as site surveys of historic and present sites and likely habitat.

GROUNDS MAINTENANCE (1977-1979): At Fernwood Nature Center, maintained flower and plant beds, including weed control and dead-heading plants. Assisted in prairie restoration, including seed collection and cleaning, outplanting, weed control, and controlled burns.

## EDUCATION

University of Hawaii, M.S. in Botany, August 1982 to May 1986

Michigan State University, B.S. in Botany, September 1977 to June 1981

Universidad de Costa Rica (Organization for Tropical Studies), Tropical Ecology, June to August 1987

Andrews University, Biological Survey of Australia and New Zealand, August to December 1985

## PUBLICATIONS AND REPORTS

Brueggemann, M.M. 2004. A Plan for Hawaiian Plants and Their Ecosystems. *Endangered Species Bulletin* 28(4): 28-29.

----- 2001. Hawaii Rare Plant Restoration Group – partners in plant conservation. *Plant Conservation* 15(10): 2.

----- 1999a. Report on a botanical survey of Midway Atoll, April 1-7, 1995. Prepared for U.S. Fish and Wildlife Service, Oahu National Wildlife Refuge Complex, Honolulu, Hawaii. Unpublished.

----- 1999b. New island records from Midway and Laysan. *Bishop Museum Occasional Papers* 59: 1.

----- 1996a. Endangered and Threatened Wildlife and Plants; Final Rule to Delist *Bidens cuneata* (cuneate bidens), a Hawaiian Plant. *Federal Register* 61(25): 4972-4973.

----- 1996b. Hawaii's Dry Forests. *Endangered Species Bulletin* 11(1): 26-27.

----- 1996c. Endangered and Threatened Wildlife and Plants; Endangered Status for the Plant *Delissea undulata* (No Common Name). *Federal Register* 61(198): 53124-53130.

----- 1996d. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Three Plant Species (*Cyanea dunbarii*, *Lysimachia maxima*, and *Schiedea sarmentosa*) from the Island of Molokai, Hawaii. *Federal Register* 61(198): 53130-53137.

----- 1996e. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Thirteen Plants from the Island of Hawaii, State of Hawaii. *Federal Register* 61(198): 53137-53153.

----- 1996f. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for 10 Plant Taxa from Maui Nui, Hawaii. *Federal Register* 62(94): 26757-26770.

----- 1995a. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Nineteen Plant Species from the Island of Kauai, Hawaii. *Federal Register* 60(185): 49359- 49377.

----- 1995b. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Thirteen Plants from the Island of Hawaii, State of Hawaii. *Federal Register* 60(185): 49377- 49392.

----- 1995c. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Twenty-five Plant Species from the Island of Oahu, Hawaii. *Federal Register* 60(190): 51398- 51417.

----- 1995d. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Fourteen Plants from the Hawaiian Islands. *Federal Register* 60(190): 51417-51432.

- 1995e. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Three Plant Species (*Cyanea dunbarii*, *Lysimachia maxima*, and *Schiedea sarmentosa*) from the Island of Molokai, Hawaii. Federal Register 60(190): 514360-51443.
  - 1994. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for the Plant *Delissea undulata* (No Common Name). Federal Register 59(122): 32946-32951.
  - 1987a. Coastal Scrub on Basaltic Rock. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1987b. Dryland Sclerophyll Forest. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1987c. *Pili* Grassland. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1987d. *Kakonakona-ilima* Seasonally Dry Scrub-grassland. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1987e. *Eragrostis variabilis* Grassland. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1987f. Mixed Lowland Forest. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1987g. Sparse Moss, Lichen and Grass Stone Desert. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1987h. *Rhacomitrium* Stone Desert. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1987i. *Pandanus* Forest. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1987j. Montane Bogs. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1986a. Coastal Scrub on Lithified Dunes. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1986b. Coastal Scrub on Sand Dunes. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1986c. Grasses and Herbs on Coastal Dunes. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1986d. Coastal Scrub on Raised Coral Reef. Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1986e. Low Wetlands (Coastal Marshes). Landmark Evaluation Report for National Park Service Cooperative Parks Studies Unit. Honolulu, Hawaii.
  - 1986f. Taxonomy, survivorship, and tissue water relations of *Marsilea villosa*. Master's thesis, University of Hawaii. Unpublished.
  - 1982. Endangered and threatened plants of Berrien County, Michigan. Prepared for Michigan Natural Heritage Program, August 4, 1982. Unpublished.
- Bruegmann, M.M., V. Caraway, and M. Maunder. 2002. A safety net for Hawaii's rarest plants. *Endangered Species Bulletin* 28(3): 8-11.
- Bruegmann, M.M., L.A. Mehrhoff, and J.M. Yoshioka. 1994. Endangered and Threatened Wildlife and Plants; Endangered Status for 11 Plants from the Koolau Mountain Range, Island of Oahu, Hawaii. Federal Register 59(59): 14482-14493.
- Bruegmann, M.M., L.A. Mehrhoff, and D.R. Herbst. 1994. Endangered and Threatened Wildlife and Plants; Endangered Status for Three Plants from the Waianae Mountains, Island of Oahu, Hawaii. Federal Register 59(122): 32932-32938.
- Bruegmann, M.M., J.E. Canfield, and D.R. Herbst. 1994. Endangered and Threatened Wildlife and Plants; Endangered Status for Four Ferns from the Hawaiian Islands. Federal Register 59(185): 49025-49863.
- Bruegmann, M.M. and Z.E. Ellshoff. 1994. Endangered and Threatened Wildlife and Plants; Endangered Status for the Plant *Tetramolopium capillare* (*Pamakani*). Federal Register 59(189): 49060- 49863.

- 1994. Endangered and Threatened Wildlife and Plants; Endangered Status for the Plant *Poa mannii* (Mann's bluegrass). Federal Register 59(217): 56330- 56333.
- 1994. Endangered and Threatened Wildlife and Plants; Endangered Status for Three Hawaiian Plant Species of the Genus *Melicope*. Federal Register 59(232): 62346-62352.
- 1996. Endangered and Threatened Wildlife and Plants; Endangered Status for the Hawaiian Plant *Pritchardia aylmer-robinsonii* (wahane). Federal Register 61(153): 41020-41024.
- 1996. Endangered and Threatened Wildlife and Plants; Endangered Status for Three Plants from the Island of Nihoa, Hawaii. Federal Register 61(163): 43178- 43184.
- Center for Plant Conservation. 1992a. A strategy for conserving the endangered plants of Hawaii. March 6, 1992. Center for Plant Conservation, St. Louis, Missouri. Unpublished.
- 1992b. Report on the rare plants of Puerto Rico. July 15, 1992. Center for Plant Conservation, St. Louis, Missouri. Unpublished.
- 1992c. Summary of the Texas rare plant task force meetings (1989-1992). December 15, 1992. Center for Plant Conservation, St. Louis, Missouri. Unpublished.
- 1992d. Report on the rare plants of Hawaii. December 18, 1992. Center for Plant Conservation, St. Louis, Missouri. Unpublished.
- 1992e. Monitoring methods for *Helonias bullata*. Prepared for U.S. Fish and Wildlife Service, Newton Corner, Massachusetts. Center for Plant Conservation, St. Louis, Missouri. Unpublished.
- 1992f. Recovery plan for *Marsilea villosa*. Prepared for U.S. Fish and Wildlife Service, Portland, Oregon. Center for Plant Conservation, St. Louis, Missouri. Unpublished.
- Hawaii Heritage Program. 1988a. Kaena Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1988.
- 1988b. Puu Makaala Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1988.
- 1989a. Native biological resources of Amfac lands, West Maui, Hawaii. Prepared for Amfac, Hawaii, Inc., Honolulu, Hawaii. January 1989.
- 1989b. Hanawi Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. February 1989.
- 1989c. Rare plants, animals and natural communities reports from Maui Land and Pineapple Company lands, West Maui, Hawaii. Prepared for Maui Land and Pineapple Company, Inc., Kahului, Hawaii. March 1989.
- 1989d. West Maui Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. April 1989.
- 1989e. Waimanu National Estuarine Research Reserve. Rare plants, animals and natural communities database records and maps. Prepared for State of Hawaii, Natural Area Reserves System, Honolulu, Hawaii.
- 1989f. Ahihi-Kinau Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. July 1989.
- 1989g. Hono o Na Pali Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. November 1989.
- 1989h. Kipahoe Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. November 1989.
- 1989i. Kahaualea Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1989.
- 1989j. Kuia Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1989.
- 1989k. Manuka Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1989.
- 1989l. Puu o Umi Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1989.

- 1989m. Laupahoehoe Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1989.
- 1989n. Olokui Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1989.
- 1989o. Puu Alii Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1989.
- 1989p. Mt. Kaala Natural Area Reserve management plan. Prepared for State of Hawaii, Department of Land and Natural Resources, Natural Area Reserve System, Honolulu, Hawaii. December 1989.
- 1990a. Native biological resources of Pelekunu Preserve, Molokai, Hawaii. Prepared for The Nature Conservancy of Hawaii, Molokai Preserves, Kaluapuu, Hawaii. February 1990.
- 1990b. Biological database and reconnaissance survey of the Department of Hawaiian Home Lands Kawaihae Parcel. Prepared for State of Hawaii, Department of Hawaiian Home Lands, Honolulu, Hawaii. April 1990.
- 1990c. Biological database and reconnaissance survey of Na Pali Coast State Park, Halelea District, Island of Kauai. Prepared for State of Hawaii, Department of Land and Natural Resources, Division of State Parks, Outdoor Recreation and Historic Sites, Honolulu, Hawaii. June 1990.
- 1990d. Biological database and reconnaissance survey of rare species and natural communities in the Kahuku study area. Prepared for The Estate of James Campbell, Honolulu, Hawaii. June 1990.
- 1990e. Biological database and reconnaissance survey of the Department of Hawaiian Home Lands Kula Parcel. Prepared for State of Hawaii, Department of Hawaiian Home Lands, Honolulu, Hawaii. October 1990.
- 1991a. Biological database and reconnaissance survey of the Department of Hawaiian Home Lands Hoolehua Parcel. Prepared for State of Hawaii, Department of Hawaiian Home Lands, Honolulu, Hawaii. January 1991.
- 1991b. Biological database and reconnaissance survey of Waianapanapa State Park, Hana District, Island of Maui. Prepared for State of Hawaii, Department of Land and Natural Resources, Division of State Parks, Outdoor Recreation and Historic Sites, Honolulu, Hawaii. 1991.
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- 2012. Revised recovery objective guidelines, draft. Prepared for the Pacific Islands Fish and Wildlife Office, U.S. Fish and Wildlife Service, Honolulu, Hawaii. 12 pages. Unpublished.
- In prep. An integrated plan for the conservation of Hawaii's unique plants and their ecosystems. Prepared for U.S. Fish and Wildlife Service, Pacific Islands Office, Ecological Services, Honolulu, Hawaii.
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- Russell, C. and M.M. Bruegmann. 1996a. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Nineteen Plant Species from the Island of Kauai, Hawaii. *Federal Register* 61(198): 53070-53089.
- 1996b. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Twenty-five Plant Species from the Island of Oahu, Hawaii. *Federal Register* 61(198): 53089-53108.
- 1996c. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Fourteen Plant Taxa from the Hawaiian Islands. *Federal Register* 61(198): 53108-53124.
- Wagner, W.L., M.M. Bruegmann, D.R. Herbst, and J.Q.C. Lau. 1999. Hawaiian Vascular Plants at Risk: 1999. *Bishop Museum Occasional Papers*: 60: 1-58.

## **SPECIAL SKILLS, ACCOMPLISHMENTS, AND AWARDS**

### **SKILLS**

- Biology:** Familiar with conservation biology theory and practice, especially of subtropical insular and tropical ecosystems. Knowledge of temperate ecosystems of northeastern North America. Monitoring and experimental research - research design, data collection (under harsh conditions), statistical analysis, and report writing.
- Computers:** Skilled in several word processing programs, especially MS Word 2010. Familiar with Access database software, including creating and maintaining databases and producing lists and report. Familiar with ARCMAP software for data analysis and map making. Skilled in use of spreadsheets in Excel. Learning MS Project for project management.
- Administration:** Schedule and attain goals for multiple projects. Have taken seminars in time management, supervisory skills, and project management. Recruit and supervise staff. Devise procedures to increase efficiency and accuracy. Identify problems and offer solutions. Strong organizational skills.
- Teaching:** Prepare and teach laboratories and field trips. Present complex concepts to various types of audiences, including the Endangered Species Act, conservation biology, water relations, ecosystem planning, and taxonomy.
- Other:** Work well unsupervised. Fast learner. Willing to work long, flexible hours under harsh conditions. Photography.

### **TRAINING COURSES**

- Basic Aviation Safety (8 hrs) 1993, 1996, 1998, 2001, 2004, 2007, 2010, 2012, 2014
- Basic Data Analysis and Experimental Design (40 hrs) 2002
- Communicate for Results (8 hrs) 2007
- Data Analysis II: Statistical Techniques (40 hrs) 2007
- Detail to Regional Office, Portland, Listing Branch (2 wks) 1994
- An Ecosystem Approach to Conservation (40 hrs) 1996
- Effective Communication Skills for Managing Conflict and Confrontation (8 hrs) 2007
- Endangered Species Recovery Implementation (40 hrs) 2001
- Endangered Species Recovery Planning (40 hrs) 2004
- Evaluating Reintroductions As a Plant Conservation Strategy: Two Decades of Evidence (36 hrs) 2009
- First Aid and CPR (8 hrs) 2009
- Getting It All Done (8 hrs) 2009
- GIS Introduction for Conservation Professionals (24 hrs) 2004, 2009, 2013
- Grant Writing for Conservation (24 hrs) 2004
- Introduction to Grants and Cooperative Agreements for Federal Personnel, 2010
- Habitat Conservation Planning for Endangered Species (40 hrs) 1997
- Hawaii Conservation Conference 1996 through 2010
- Hawaii Hunter Education (13 hrs) 2003

Hawaiian Language, ongoing online course since 2008  
How to Lead a Team (8 hrs) 1996  
How to Manage Multiple Projects, Meet Deadlines, and Achieve Objectives (8 hrs) 1998  
Intermediate WordPerfect for Windows (8 hrs) 1995  
Introduction to Conservation Biology (40 hrs) 2009  
Introduction to Federal Grants and Cooperative Agreements for Federal Employees (36 hrs) 2010  
Introduction to Paradox (16 hrs) 1996  
Introduction to Quattro Pro for Windows (8 hrs) 1995  
Introduction to Windows (8 hrs) 1995  
Introduction to Windows 95 (7 hrs) 1997  
Introduction to WordPerfect for Windows (16 hrs) 1995  
Learning to Lead Collaboratively (16 hrs) 2007  
Monitoring Database Administrators' Workshop (16 hrs) 1997  
Measuring and Monitoring Plant Populations (48 hrs) 1999  
Monitoring Federal Grants and Cooperative Agreements for Federal Employees (24 hrs) 2010  
Negotiation Strategies and Techniques (16 hrs) 1995  
NEPA Cumulative Effects Training (8 hrs) 1996  
Principles of Modeling for Conservation Planning and Analysis (40 hrs) 2006  
Recovery and section 7 national workshop (40 hrs) 2009  
Sling-Load and Hover Hook-up/Long-line and Remote Hook-up (8 hrs) 1996  
Scientific Principles and Techniques for Endangered Species Conservation (40 hrs) 2000  
Stress Reduction (8 hrs) 1997  
Successful Communication Skills (8 hrs) 1997  
Team Effectiveness Training (48 hrs) 1999  
Water Ditching and Survival (4 hrs) 1994, 2001, 2003  
Wilderness First Aid 2012  
Word 2002 – Level 1 and 2 (16 hrs) 2003

### ***AWARDS***

Superior Performance Award 1993, 1994, 1995, 2007, 2008, 2009, 2010, 2011  
Special Thanks for Achieving Results 1996, 1997, 1998, 1999, 2003, 2005, 2010, 2012  
On-the-Spot Awards - three in 1997, one in 1999, one in 2001, one in 2003, one in 2005  
Time Off Recognition 2007  
Graduated Michigan State University with honors  
Michigan Competitive Scholarship 1997-1981

### ***MEMBERSHIPS***

Society for Conservation Biology 1987-present  
Natural Areas Association 1987-present  
Hawaii Audubon Society, 1987-2005  
The Nature Conservancy, 1983-2000  
Hawaiian Botanical Society, 1982-present, vice-president 1989  
Sigma Xi, 1986-1992  
Michigan Natural Areas Council, 1979-1990  
Michigan Nature Association, 1978-1984  
Michigan Botanical Club, 1978-1982, environment committee