



# OREGON FLORA

## *Newsletter*

VOLUME 10, NUMBERS 2&3

OREGON STATE UNIVERSITY

JUNE / OCTOBER 2004

### ANNOUNCING THE OREGON PLANT ATLAS!!

*This combined issue is devoted to the Oregon Plant Atlas, addressing its status as of our actual publication date, June 2005. After many years of work, we are making this resource available to the general public. This combined issue provides articles about the database, the mapping program, how the Atlas has evolved, and the people who have made it happen. Also included is a special pull-out guide to using the Atlas. The Atlas can be accessed through the Oregon Flora Project website at [www.oregonflora.org](http://www.oregonflora.org).*

#### **Scott Sundberg** **Oregon botanist, 1954-2004**

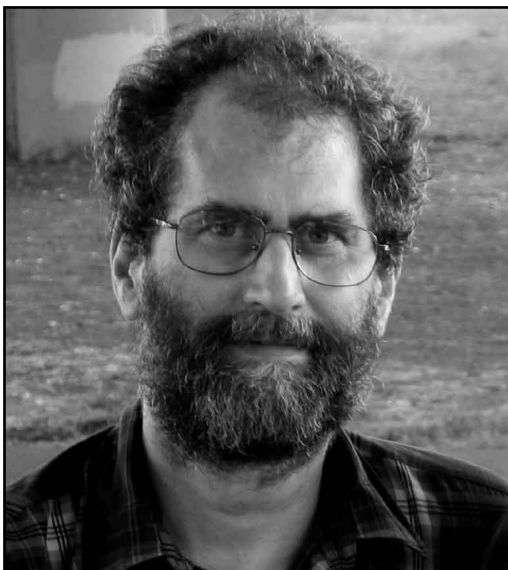
*by Aaron Liston*

*Oregon State University Herbarium Director*

Scott Sundberg, director of the Oregon Flora Project, died December 30, 2004 of cancer. He had struggled for many years, most of them privately, with the symptoms of multiple sclerosis. Yet it was cancer, diagnosed only in September 2004, which led to his passing.

Scott Donald Sundberg was born February 10, 1954 in Eugene, Oregon. Scott began his botanical career as an undergraduate at the University of Oregon. Among Scott's early scientific mentors were Prof. George Carroll and George's wife, Fannie. Scott was involved in studies at the H.J. Andrews Experimental Forest, where he collected the type specimen of a rare lichen, *Nephroma occultum*. Scott became fascinated with plant taxonomy, and soon was conducting independent study projects

*See Scott, page 8*



*Photo: Mark Sundberg*

*Scott Sundberg, 1954-2004.*

#### **The future of the** **Oregon Flora Project**

*by Linda Hardison*

*Oregon Flora Project Coordinator*

I have followed the progress of the Oregon Flora Project for many years due to my long and close relationship with Scott Sundberg (we had been together since 1983). I realize that Scott's goal to prepare a new flora for Oregon germinated long before I knew him; however, I have been witness to over two decades of its development and growth. The present public release of the Atlas represents a significant accomplishment and is one of many that will grow from the dream Scott nurtured.

The Flora will follow a well-planned path to its completion thanks to Scott's vision. Limited funds have kept our staff numbers small, yet our workers are highly skilled and dedicated. Collaborations with NACSE and the OSU Herbarium led to federal grants which have funded software development for the online presentation of data and the databasing of the Oregon specimens. As these projects approach completion their fruits can be seen in the rich data set supporting the Oregon Plant Atlas. They will also be evident in a Digital Field Guide soon to be launched on our website.

Scott developed collaborations with botanists, photographers, cartographers, and programmers throughout the state. Recognizing that skills do not lie exclusively with professionals or academics, he nurtured relationships with amateur plant enthusiasts, high schoolers, retirees, and others who, appreciating what the Flora Project can offer, have volunteered skills and support. Volunteerism will continue to be a key to the success of our undertaking; it is an aspect of our Project to which we owe both respect and gratitude.

The Oregon Flora Project will advance on several fronts in the upcoming year. To aid authors of our treatments of families and genera, the Checklist databases have been restructured, and the process for preparing manuscripts is being streamlined. An April meeting of the Checklist project leaders and

*See Future of OFP, page 9*

*Scott, continued from front page*

in the University of Oregon Herbarium. Scott benefited from working with two herbarium curators: recently-retired Georgia Mason, and newly-hired David Wagner. Scott graduated from the University of Oregon in 1978 with a B.Sc. (Honors) in Biology. From 1978 to 1980, Scott was employed as a botanist for the Bureau of Land Management, Coos Bay District. During that period, he gained considerable experience with the flora of southwestern Oregon. He made numerous noteworthy collections, and discovered new localities for many rare plant species.

In 1981, Scott moved to Austin, Texas, to begin graduate studies at the University of Texas. He worked under the supervision of Prof. Billie Turner, and, like almost of all of

Turner's students, Scott turned his attention to the composite family. Scott's taxonomic research in the Asteraceae continued throughout his career. Scott received his Ph.D. in Botany in 1986. His dissertation was entitled "The Systematics of Aster Subg. *Oxytripolium* (Compositae) and Historically Allied Species."

Scott met his wife, Linda Hardison, in Austin. They married in Jakarta, Indonesia on August 13, 1986. That year, Scott began a one-year post-doctoral position at Ohio State University, working with Prof. Tod Stuessy. The following year, the couple returned to the Pacific Northwest as

*"The Atlas is such a treasure. I keep finding new ways to use it, new kinds of questions for it to answer, new ways to answer old questions. It is a reference librarian's delight! Many thanks to Scott and to all of you good people who had the vision and perseverance to make it happen and who keep making it even better."*

— Connie Hopkins Battaile, retired librarian, Ashland, OR

Linda began her Ph.D. studies at the University of Washington. Over the next several years, Scott taught courses and conducted plant systematics research in the Department of Botany. From 1991-1994, Scott was a Botanical Consultant for Ebasco Environmental, Inc. in Bellevue, Washington. During that time he conducted rare plant surveys throughout Oregon and Washington.

Scott moved to Corvallis in early 1994, and Linda joined him in 1996 after completing her dissertation. Scott was hired to oversee the integration of the University of Oregon and Oregon State University Herbaria. Soon after, Scott initiated the Oregon Flora Project. In 1999, Scott was promoted to a Research Assistant Professor. The same year, Scott and Linda's son Matthew was born.

Scott's 29 scientific publications include taxonomic papers (descriptions of new species, nomenclatural changes, and new classifications), laboratory-based investigations in plant systematics, and treatments for checklists, field guides, and floras. The majority of his publications concern the composite family. In addition, Scott has contributed numerous articles to the *Oregon Flora Newsletter*. A complete list of his scientific publications will appear in the on-line version of this publication.

Scott devoted the last decade of his life to the Oregon Flora Project. As Coordinator, he directed over 230 volunteers and supervised over 60 student and several professional employees. He established the *Oregon Flora Newsletter*, the Oregon Vascular Plant Checklist, and the Oregon Plant Atlas. It is tragic that Scott did not live to see the completion of his dream, a comprehensive Flora for the approximately 4,500 Oregon plant species. However, his activities created an extremely strong foundation for the continued growth of the Oregon Flora Project. The Flora will serve as an enduring legacy to Scott's commitment to botanical education, and the documentation and conservation of Oregon's unique and diverse flora.

A memorial service celebrating Scott's life was held in January 2005 in Corvallis, OR. Memorial gifts in his honor can be made to NPSO, Oregon Flora Project, and mailed to P.O. Box 402, Corvallis, OR 97339. ☹

- Aaron Liston, Oregon State University Herbarium Director

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*Erythronium oregonum* logo and masthead designed by Tanya Harvey.

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The Oregon Flora Newsletter is published three times a year by the Oregon Flora Project and the Oregon State University Herbarium. The Editor is Rhoda Love and the Production Assistant is Rena Schlachter.

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*“I’ve just used the website for the Atlas mapping program for the first time. The announcement in the NPSO bulletin asks for comments. My comment is “WOW!” This is a fantastic resource. Thank you for making it widely available. I’m sure I will be using it regularly for teaching and research.”*  
 — Prof. Mark Wilson, Dept. Botany & Plant Pathology, OSU

*Future of OFP, continued from front page*

advisory board infused new energy into this important facet; all participants will be helping us meet our goal of completing the Checklist by Spring 2006.

At the end of this summer, we will launch a prototype of the Digital Field Guide. Within its framework, a user visiting our website ([www.oregonflora.org](http://www.oregonflora.org)) will be able to key an unknown plant to family (and in some families, identify that plant to species), view photos, check nomenclature, and connect to the Atlas mapping program. While the number of taxa initially presented will be limited, the upcoming years will see the addition of depth and breadth to this framework. Current, accurate plant data is critical for progress in many arenas; the Oregon Flora Project is working to develop collaborations and joint grant proposals that will apply our data in new contexts, thereby increasing the value of the information.

What do I see for the future of the OFP? Through my lens of historical perspective and with my current view as coordinator, I see the continuing development of a carefully designed, rigorously curated body of plant information that will be the primary source for Oregon plant data tapped by users of all interests and abilities. I see our project as a model for others wanting to create a similar resource. I see our data being accessed through many online venues, contributing to a more comprehensive knowledge of biodiversity. I also see the need constantly to improve and monitor the information we present to the world. Oregon’s plant life is a dynamic system; as observers and disseminators of information about this system, we must keep pace with its changes.

Acquiring the financial means to accomplish this future goal is a constant challenge. The cost in knowledge lost to *not* develop and maintain this information, however, is too great. The Oregon Flora Project will continue to forge relationships and garner support, allowing us to spread the fruits of our efforts for the benefit of all. 🌱

## A databasing milestone

by Aaron Liston

*Atlas Project Leader, Checklist Project Leader, and Oregon State University Herbarium Director*

In April 2004, the Oregon State University Herbarium reached a milestone: a decade had passed since the first entries were made into a database of Oregon vascular plant specimens. The pioneer in those early efforts was Barbara Wilson, who together with the Carex Working Group (*OFN 2:1, 1996*) spearheaded the entry of *Carex* specimens into a relational database. Several later projects added data from the type specimens, the genus *Senecio*, and invasive plants. The database grew slowly through the 1990s reaching 20,000 specimens in late 1999.

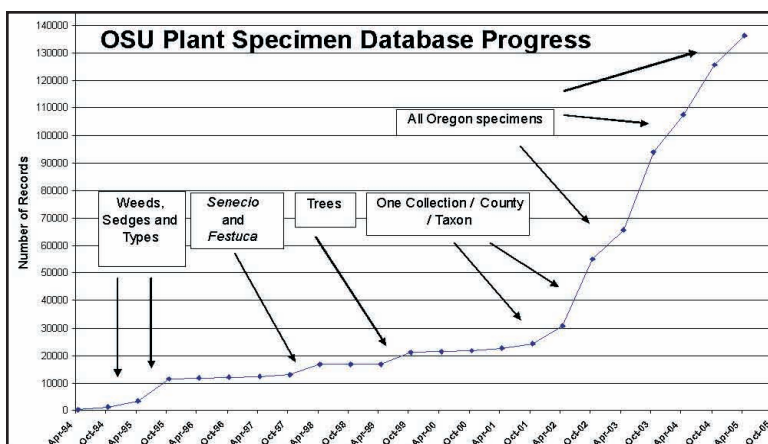
The database received a major boost in the fall of 2001, when Scott Sundberg received funding from the Bureau of Land Management to database one specimen per county of every Oregon taxon. That project (*OFN 8:3, 2002*) resulted in a database of 55,000 specimens, and provided the first comprehensive data set for mapping Oregon taxa to the county level. Based on the success of that project, Scott Sundberg and I submitted a proposal to the US National Science Foundation to complete a database of all Oregon vascular plant specimens in the OSU Herbarium. We were thrilled when that 3-year project was funded in February 2003. The NSF grant funds data entry, quality control, and georeferencing of localities. The latter is a critical step that allows the specimens to be mapped in the Oregon Plant Atlas.

With the boost provided by that funding, and the herculean efforts of Ann Willyard, Thea Cook, Katie Mitchell, Stephen Meyers, and over 20 undergraduate students, the database now comprises nearly 140,000 Oregon specimens. Over 100,000 of these are georeferenced (see article by Katie Mitchell in this issue), and can be mapped through the Oregon Plant Atlas. We

anticipate completion of the database this summer. In addition to the vascular plants, databases of our type specimens and over 50,000 fungal specimens are also available. Of course, the database will never be truly complete, as we plan to continue entering all new specimens. We also anticipate future enhancements, such as adding specimen images, linking our records with other national and international databases, and eventually entering all of our non-Oregon specimens as well. 🌱

The vascular plant specimen database can be accessed online at:

<http://oregonstate.edu/dept/botany/herbarium/db.php>



From April 1996 to April 2005, almost 140,000 OSU Herbarium specimens have been databased.

## **The Oregon Flora Checklist: nomenclatural decisions and other considerations**

*by Kenton L. Chambers*

*Checklist Project Leader and Professor Emeritus in Botany*

Like any lengthy on-going project, the Oregon Flora Checklist has had to keep abreast of changing circumstances and new developments in relevant areas of science, in our case the rapidly advancing field of plant systematics. The Checklist Project began in 1989, when Karl Urban developed a computerized list of names drawn from the available floristic references that covered part or all of the geographical area of the state. Morton Peck's *A Manual of the Higher Plants of Oregon* was out of print and, in any case, was taxonomically far out of date. A checklist that would embody the latest taxonomic research to update the nomenclature of the flora was a necessary first step towards writing a new "Manual" for Oregon.

With the research herbaria of the University of Oregon, Oregon State University, and Willamette University now assembled in Corvallis, workers here can review all the specimens of each species, correct obvious errors in identification, and annotate each sheet with what we take to be its most accurate, up-to-date name. These names subsequently become incorporated in a computerized database, on which all other aspects of the Oregon Flora Project depend. The preparation of this database, comprising all the Oregon collections in the herbaria at OSU, is described by Aaron Liston on page nine.

The Checklist Project has proceeded much as planned, with the publication on family Asteraceae (574 taxa) appearing in 1998. Many other families have been completed, but some large, complex ones—grasses, roses, mustards, figworts, knotweeds, saxifrages, buttercups—are only partly finished. Databasing of species not yet revised for the checklist had to be done using whatever name or annotation existed on each specimen. If we modify these older annotations when we do a checklist treatment, the computer program easily adapts our changes to the database. Writing of the checklist is being done by volunteers, all of whom have professional taxonomic training.

In the time since the checklist was initiated, the field of plant taxonomy has undergone some major advances, which significantly affect our efforts. Many of the families and genera in our flora have been the object of molecular studies, principally involving DNA-based phylogenetics. Almost invariably this work leads to novel and sometimes surprising reinterpretations of species relationships, which in turn necessitate nomenclatural changes—often placing species in new, unfamiliar genera. We have noted such major changes occurring

in family Asteraceae, for example, *since* the time we published our Oregon Checklist booklet. The volumes of *Flora of North America* for Asteraceae, to be published in 2005, will reflect these changes. I envision us having to re-annotate hundreds of herbarium specimens with new generic and specific names, and similarly to modify the names in the specimen database. It is essential that a cross-reference to synonyms is provided to users of the Oregon Flora Atlas, to connect back to the previous species names in common usage up to now.

The second area of scientific advance to be mentioned is that of computerization of taxonomic information and electronic access to keys, descriptions, illustrations, maps, specimen label data, specimen images, and taxonomic literature. Wireless access even allows such information to be obtained while in the field, not just at one's computer desk. To what extent this "information revolution" will take the place of traditional printed floras and checklists is a subject now being debated by taxonomists and floristics research specialists around the country. With the input of ideas and suggestions from those who will be using the results of the Oregon Flora Project, we will continue to evaluate these advances, so as best to steer the project in the direction of optimum usefulness and accessibility. 🌿

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## **Building the online Plant Atlas**

*by Clayton Gautier,*

*Atlas Project Leader and Software Developer*

Successful software design often depends on finding a good balance between dreams and reality. Consequently, when Scott Sundberg and I began discussing the Oregon Plant Atlas project almost a decade ago, our primary goal was to formulate an overall vision for the project that we felt would be achievable within the practical constraints of currently available technology and the project's limited resources. We must have done a pretty good job because what we decided we wanted to build back then is basically what we have today—a highly interactive, Web based client-server application that creates plant distribution maps on the fly and lets users "drill down" to get details on specific mapped locations by simply clicking on them.

This was definitely a tall order back in 1996 when building sophisticated software for the Web was still in its infancy, but we were fortunate. Sun Microsystems' Java was just then emerging as a popular and affordable enabling technology for Web development and Java appeared to have everything we

*See Building the Atlas, page 11*

*"Thomas Jefferson told Lewis and Clark to go out there and identify everything. Well, it's been two hundred years and it is high time we had an inventory.*

*"In a way, it is fitting that this should be such a grassroots sort of thing. Instead of a huge federal agency that could have put a few million into a Flora Project, but hasn't and won't, it is heartening to see that many dedicated people will get the job done."*

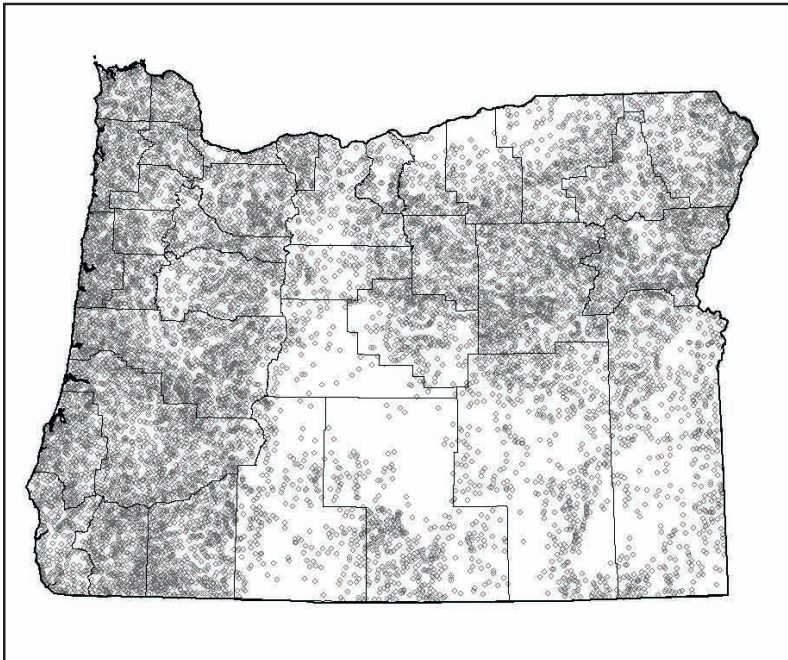
*— Jerry Igo, naturalist & botanist, Mosier, OR*

*Building the Atlas, continued from page 10*

needed: a full featured, modern programming language; write-once/run-everywhere multi-platform support; ability to automatically download executable code to client workstations from a Web server; and support for client-server database connectivity. The Atlas makes use of all of these features of Java and in large part, owes its success to them.

Throughout most of its life, the Atlas has been based on the version 1.1 release of Java. This version, which first became available to developers in early 1997, has some serious shortcomings including limited user interface support and little or no support for printing and copy/paste operations. Sun addressed these problems with the release of Java 2.0 in late 1998. Unfortunately, this newer version of Java caused developers (including us) some serious headaches. For one thing, most popular browsers failed to provide full Java 2.0 support until just recently (in large part because of the Sun-Microsoft lawsuit). For another, Sun changed many of Java's programming interfaces (API's) which means that converting programs from Java 1.1 to Java 2.0 requires considerable rewriting of code and additional testing work. Despite the hurdles, we have recently managed to complete a much improved Java 2.0 version of the Atlas and are pleased to include it as part of the public release. ☺

*Acknowledgments: Thanks go to Dr. Jon Kimerling in the OSU Department of Geosciences for providing the base maps used by the Atlas and the cartographic projection logic for the algorithm that converts decimal longitude and latitude coordinates into base map plot points.*



*Map: Midpoints, locations along the stream equidistant from the mouth and the source, of named rivers and streams in Oregon created using a GIS (Geographic Information System) and recently added to the locality data set.*

### Atlas observation sources

- Oregon Natural Heritage Information Center (ORNHIC)
- Mt. Hood National Forest
- NPSO field trip species lists
- Personal observations
- Many other organizations, groups, and individuals

### From data to dots

*by Katie Mitchell*

*Oregon Flora Project Data Manager*

For several years, the Oregon Flora Project has been assembling data about plant distributions to create a comprehensive, interactive atlas of vascular plants in Oregon. With over 4,500 taxa and approximately 96,000 square miles of land in Oregon, this requires an abundance of data. Plant lists from the Native Plant Society of Oregon, individual botanists, government agencies and scientific publications comprise the bulk of the Atlas data set. Herbarium specimen data from OSU herbaria and other herbaria (see *A reference for the future*, page 12) are also used.

Each source of data presents a challenge for incorporation into the Atlas. Whether an observation or collection, for the occurrence to be mapped, it must be given a set of latitude and longitude coordinates. Sometimes, plant occurrence records already have coordinates, in particular more recent records, due to the growing popularity of personal GPS units. Most often, the coordinates must be interpreted from other location information using the Project's locality data set. This is a list of standardized location names with corresponding center coordinates and fuzz values. The fuzz value represents the radius around the center which encompasses the entire area described by the location name. The fuzz value is displayed in the Atlas as the accuracy of the mapped location.

Nearly two thirds of the herbarium specimens entered into the database today have locations that are interpreted automatically, based on exact matches with the locality data set. For the other specimens, locations are interpreted by student workers. The students use a variety of tools and resources to determine the location described by the collector. Most commonly used are electronic maps, paper maps and online resources. In some cases, historic place names have been used and books on Oregon history are useful. Observations may also be interpreted, although most have township, range and section information and are interpreted automatically. Finally, the online Oregon Plant Atlas assembles all of the occurrences for each taxon selected, and plots them on a selected base map. ☺

*“What can I say about the Oregon Plant Atlas - FANTASTIC! I have spent a happy hour (or two) mapping the Calochortus species we saw, the Penstemon species we saw, Xerophyllum on the rainfall map, the rocky habitat Silene species we saw, etc. Really great. I hope to put some of the maps, of course with acknowledgment, in our Alpine Garden Society species list/report.*

*“It really is the neatest on-line mapping scheme I have ever seen. I am lecturing at the British Ecological Society in September at a symposium to celebrate 50 years of the Biological Records Centre - they should see the Oregon Plant Atlas, which I will be plugging!”*

— Dr. John Birks, visiting scholar, University of Bergen, Norway

## **A reference for the future: database management to accommodate growth**

*by Thea Cook*

*Oregon Flora Project Data Manager*

The Atlas is one of the most exciting products of the Oregon Flora Project. Containing over 386,000 data points, this resource is the first comprehensive on-line mapping tool for Oregon plants to become available to the public. At the foundation of the Atlas are specimen and observation databases which are constantly updated by a combination of avid field workers and those who carefully perform the data entry. Launching of the Atlas at this time has required dedication and commitment by our staff and many volunteers who have, together, spent thousands of hours databasing, georeferencing and performing quality control.

Various data sources have been used to compose the Atlas. Our most reliable source is over 119,000 herbarium specimens. Approximately 102,000 of these are housed at OSU. The OSU collection also includes herbarium sheets originally from the University of Oregon and Willamette University. The latter is the collection that was maintained by Morton Peck, who used them to create the original *A Manual of the Higher Plants of Oregon* in 1941. Maps are periodically updated as new specimens are added to the herbarium. Data sets from 13 other herbaria have also been donated, representing over 17,000 mapped points. Their housing institutions are listed below.

Our most populous data set, made up of field observations, has created over 267,000 Atlas points. The data comes from

### **Atlas herbarium sources**

- Bureau of Land Management, Burns
- Bureau of Land Management, Lakeview
- Central Oregon Community College
- College of Idaho
- Eastern Oregon State College
- H.J. Andrews Experimental Forest
- Harvard University
- Lane Community College
- Linfield College
- New York Botanical Gardens
- Oregon State University
- Southern Oregon University
- Utah State University

individuals and organizations such as the Native Plant Society of Oregon and the Oregon Natural Heritage Information Network. They primarily originate from species lists but also include associated species cited on herbarium labels. Additional field information is always desired. To find out how you can contribute your field research to the OFP or otherwise become involved, please contact us at: [OFPAtlas@oregonflora.org](mailto:OFPAtlas@oregonflora.org).

Our data is constantly being updated, often by readers of the *Oregon Flora Newsletter*. Various individuals help us by supplying new information and assessing Atlas data and reporting errors they may discover. If you see an error in the current version of the Atlas, please report it by clicking on the erroneous point, then clicking the *Report Possible Errors* button and following instructions.

We at the Oregon Flora Project take our hats off to everyone who has helped bring the Atlas to life. Without you, the Atlas would still be a dream of many Oregon botanists. Instead, it is now one of the cornerstones of the new Flora of Oregon. Thank you. 🌿



*We extend our hearty congratulations to staff member Thea Cook. She and husband Jeff are the proud parents of:*

**Henry Cameron Cook**  
**born November 2, 2004**

## **10th Anniversary Challenge Drive**

*by Linda Hardison*

*Oregon Flora Project Coordinator*

The Tenth Anniversary Challenge Drive, held from November 2004 - January 2005, received wonderful support from 300 individual donors, the Native Plant Society of Oregon, and NPSO chapters. These generous donors contributed \$39,597. With the matching \$26,000 from anonymous donors, providing the impetus for this fund-raiser, the Oregon Flora Project has received \$65,597! This money is a critical part of our budget; it helps pay the salaries of our staff and covers the *Oregon Flora Newsletter* publication costs. We are extremely grateful for the generosity shown by the many donors who are included in the list on page 13, and extend a special thanks to the contributors of our matching funds. The Oregon Plant Atlas is one of the many benefits your dollars have made possible—thanks to *all* donors for your support!

## Thanks

### **Do you enjoy using the Atlas? Will you help keep it going?**

The development of the Atlas and its continued support depends significantly on contributions from individual donors. Your dollars also go toward salaries for the staff and students who keep the Flora Project moving forward, as well as all newsletter expenses.

Donations to the Oregon Flora Project are tax-deductible, and can be made by sending a check made out either to the Oregon State University Foundation, or to the Native Plant Society of Oregon. In either case, please note on the check that it is for the Oregon Flora Project.

**Mail to:**

**Dr. Linda Hardison  
Oregon Flora Project  
P.O. Box 402  
Corvallis, OR 97339-0402**

With your contribution, please let us know if you do *not* wish to have your name listed in our "Thanks" column, and if you would like to be added to our *Oregon Flora Newsletter* mailing list.



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### Did you know?

- Bear Creek is the most popular stream name in Oregon. According to the GIS data set, there are 94 Bear Creeks in our state.
- The ten most popular stream names in Oregon are listed below in descending in order.

1. Bear Creek	94
2. Dry Creek	92
3. Rock Creek	88
4. Mill Creek	64
5. Cedar Creek	64
6. Spring Creek	59
7. Beaver Creek	59
8. Deer Creek	58
9. Indian Creek	55
10. Camp Creek	54

*Special double issue  
devoted to the Atlas*