



## Key Expertise

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- ❖ Rare Plant Clearance Surveys
- ❖ NEPA and ESA Compliance Documents: EIS, EA, BA/BE, CEX
- ❖ Wetland Delineations and CWA Section 404 Permitting
- ❖ Wetland Creation & Restoration Design and Monitoring
- ❖ Vegetation Mapping, Monitoring and Quantitative Data Collection
- ❖ Riparian and Wetland Functional Assessments and Buffer Analysis
- ❖ Floristic Inventories
- ❖ Noxious Weed Mapping and Management
- ❖ Ecological Restoration
- ❖ Technical Writing and Editing

## Education

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### 1999 - Master of Science

Museum & Field Studies.  
Botany Focus  
University of Colorado  
Boulder.

### 1997 - Bachelor of Arts.

Biology. Oberlin College,  
Oberlin, Ohio.

## Certifications & Skills

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- ❖ Professional Wetland Scientist (PWS)
- ❖ Riparian Assessments
- ❖ Floristic Inventories
- ❖ Qualified Botanical Contractor for USFS/BLM
- ❖ Rare Plant Clearance Surveys (Colorado Focus)
- ❖ Quantitative Vegetation Collection Protocols
- ❖ Advanced Hydric Soils
- ❖ Certified Commercial Pesticide Applicator
- ❖ AutoCAD/GIS
- ❖ Garmin & Trimble GPS

## Affiliations

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- ❖ CO Native Plant Society
- ❖ Society of Wetland Scientists
- ❖ Gilpin County Planning Commission

## Contact Info

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## Summary of Experience

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**NEPA/ESA Compliance.** Ms. Orthner has prepared and contributed to numerous NEPA and ESA compliance documents including Environmental Impact Statements (EIS), Environmental Assessments (EA), Categorical Exclusions (CEX), Biological Assessments / Biological Evaluations (BA/BE), and Environmental Impact Reports for governmental agencies. Clients include entities in the oil and gas sector, large land exchanges, residential and commercial developments, and ski resorts. In addition, she is a skilled technical writer and editor and regularly interprets and summarizes reports from a range of disciplines.

**Wetlands and CWA Permitting.** Ms. Orthner has completed dozens of wetland projects including wetland delineations, functional and ecological assessments, and nationwide and individual CWA Section 404 permit applications. In addition, she has worked on the design, implementation, and monitoring of numerous wetland creations and restorations leading to successful outcomes.

**Rare Plants.** Ms. Orthner has considerable experience with rare plants and is qualified by the U.S. Fish and Wildlife Service to conduct surveys for the federally listed Ute ladies' tresses orchid (*Spiranthes diluvialis*). In addition, she has completed dozens of surveys for other federally listed plants, United States Forest Service (USFS) and Bureau of Land Management (BLM) sensitive species, and species of concern tracked by Colorado, Wyoming, Utah, and California.

**Vegetation Mapping, Monitoring & Floristics.** Ms. Orthner routinely collects qualitative and quantitative vegetation information and maps vegetation resources via high quality aerial photography and ground-truthing. Ms. Orthner also collects baseline quantitative vegetation cover and species richness data using the Line Point-Intercept and Modified-Whittaker plot methodologies. Ms. Orthner has a strong background in plant identification and taxonomy and compiles plant species lists on each field project. During her graduate studies, she completed a floristic inventory of the Buffalo Peaks Wilderness Area, in central Colorado. In addition, Rea has made significant data and specimen contributions to several local herbaria.

**Noxious Weeds.** Rea is a certified commercial pesticide applicator and regularly uses integrated control methods to reduce weeds in habitat restoration projects. She also completes inventories and writes noxious weed management plans.

**Ecological Restoration.** Rea regularly designs custom seed mixes, planting plans and aids in designing grading plans in support of returning disturbed wetland and upland habitats to their natural state with a high-level of ecological integrity.

## Employment

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Peak Ecological Services, LLC. Nederland, CO. Sept. 2017 – present  
Western Ecological Resource Inc. Boulder, CO. Jan. 2000 – Sep. 2017  
CU Boulder Herbarium. Boulder, CO. June 1997-December 1999



## Additional Details

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**NEPA/ESA Compliance.** Rea has prepared and contributed to numerous National Environmental Policy Act (NEPA) and Endangered Species Act (ESA) compliance documents in the state of Colorado. Most recently, she has authored numerous Botanical Biological Assessment/ Biological Evaluations (BA/BEs) and Wetland Technical Reports for several ski area improvement projects in Colorado including those for: Vail Ski Resort, Beaver Creek Ski Resort, Breckenridge Ski Resort, Keystone Resort, Loveland Ski Area, Eldora Mountain Resort, Arapahoe Basin, Copper Mountain, Snowmass, and Steamboat Ski Area. Ms. Orthner has also worked on several forest health improvement projects including that for the Frisco Backyard Project in Summit County, Colorado and the Alpine Meadows Forest Health project in Placer County, California. She has also worked on large land exchanges within the state of Colorado including the Wolf Creek Land Exchange, Emerald Mountain Land Exchange, and the Salida Land Exchange. Finally, Rea has worked on several large oil and gas development projects in western Colorado for the Grand Junction and Colorado River Valley Field Offices of the Bureau of Land Management. For all these projects she completed vegetation mapping and plant community descriptions, floristic inventories, noxious weed mapping, and sensitive plant species surveys. In addition, she assisted with technical writing and editing of the Environmental Assessments (EAs) and BAs, and prepared detailed maps of vegetation communities and rare plant populations using Environmental Systems Research Institute ESRI Geographic Information Systems (GIS) software.

**Wetlands and CWA Permitting.** Ms. Orthner has considerable expertise in wetland ecology and has completed more than 100 wetland projects including U.S. Army Corps of Engineers (USACE) wetland delineations, functional and ecological assessments, and Clean Water Act (CWA) Section 404 permit applications. She has extensive experience delineating wetlands, having mapped and described hundreds of acres of wetlands in environments ranging from the plains to the subalpine. Rea regularly uses the CNHP's Ecological Integrity Assessment (EIA) methodology to evaluate the condition of wetlands, riparian habitats, as well as their adjacent buffers for local land management agencies in Colorado, but she has also used the FACWet approach for USACE projects. For wetlands influenced by flood irrigation, she has conducted complex groundwater monitoring studies to differentiate between man-made and natural wetlands. She has prepared numerous wetland permit applications for projects in Colorado, including residential and commercial developments, transportation projects, ski and golf resorts, and oil and gas exploration projects. In addition, she has worked on the design, implementation, and monitoring of numerous wetland creations and restorations. She has prepared wetland mitigation plans, specified wetland seed mixes, and developed planting plans for a variety of wetland types. Rea regularly oversees and aids in the construction and planting of wetland creations as well. Finally, Rea has monitored dozens of wetland creations and restorations and provided recommendations to successfully establish wetland vegetation in a timely and cost-effective manner.

**Rare Plants.** Ms. Orthner has considerable experience with rare plant studies and is qualified by the U.S. Fish and Wildlife Service (USFWS) to conduct surveys for Ute ladies' tresses orchid (*Spiranthes diluvialis*), a federally listed plant known from the Front Range of Colorado, Wyoming, and eastern Utah. In addition, she has completed dozens of surveys for other federally listed plants, USFS and BLM sensitive species, and species of concern tracked by the states of Colorado, Utah, Wyoming, and California. She has conducted surveys and prepared habitat assessments for species including, but not limited to, ladies' tresses orchid, Colorado butterfly plant (*Gaura neomexicana* subsp. *coloradensis*), giant helleborine orchid (*Epipactis gigantea*), Rabbit ear's gilia (*Ipomopsis aggregata* subsp. *weberi*), Harrington penstemon (*Penstemon harringtonii*), Penland penstemon (*Penstemon penlandii*), Osterhout milkvetch (*Astragalus osterhoutii*), North Park phacelia (*Phacelia formosula*), Colorado hookless cactus (*Sclerocactus glaucus*), DeBeque phacelia (*Phacelia submutica*), DeBeque milkvetch (*Astragalus debequaeus*), Naturita milkvetch (*Astragalus naturitensis*), and Adobe thistle (*Cirsium perplexans*) and has documented several new occurrences of these rare plants. Ms. Orthner is also skilled at finding and identifying many other plant species of concern including moonworts (*Botrychium* spp.), a group of rare primitive ferns that are of special concern on USFS lands in the mountains of Colorado.



## Additional Details (continued)

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**Vegetation Mapping, Monitoring & Floristic Inventories.** Rea routinely maps vegetation using the United States National Vegetation Classification (USNVC) protocol. By using high quality aerial imagery, 2-ft contours derived from LIDAR technology, and ground-truthing, vegetation maps can be generated with high precision and accuracy. In addition, details on species composition and vegetation structure are generated for each mapping polygon and the resulting maps are provided in digital format, i.e., GIS shapefile/geodatabase. Other information collected during vegetation mapping includes the location of weed infestations and/or rare plant occurrences. Another important component of Rea's work has been the development and implementation of vegetation monitoring for baseline inventories, evaluation of the success of wetland creations and restorations, and to detect year-to-year changes in sensitive plant communities. She has been actively involved several long-term ecological monitoring studies in Colorado. These studies include the seven-year quantitative monitoring of a subalpine wetland restoration near Vail Pass, a long-term monitoring study (20 years+) of high-quality fen wetlands near Breckenridge, baseline information supporting plant community descriptions for Pitkin County Open Space and Trails and the Aspen Global Change Institute, and vegetation mapping for Boulder County Open Space and Trails, and the City of Boulder Open Space and Mountain Parks in Colorado. These studies highlight Ms. Orthner's proficiency in plant identification and quantitative data analysis, and her ability to critically evaluate data to make recommendations for the successful restoration and conservation of botanical resources.

Ms. Orthner has a strong background in plant identification and taxonomy. She regularly compiles plant species list on each field project. She has also been the principal investigator on two floristic surveys for Army National Guard installations near Sheridan and Guernsey, Wyoming. In addition, Rea has made significant contributions to several local herbaria, and to the Colorado Natural Heritage Program (CNHP) and the Wyoming Natural Diversity Database (WYNDD), which are state repositories for rare plant information. Finally, during her graduate studies (1997-1999) in Boulder, Colorado, she completed a floristic inventory of the Buffalo Peaks Wilderness Area, at the southern tip of the Mosquito Range in Chaffee, Park, and Lake Counties. She collected and identified more than 750 plant specimens.

**Noxious Weed Mapping and Management Plans.** Ms. Orthner regularly maps and describes noxious and other invasive weed species using GPS and GIS technologies. She also develops Integrated Weed Management Plans that outline how to control weeds utilizing a variety of techniques including mechanical, chemical, cultural and biological control. Rea is registered with the Colorado Department of Agriculture as a Commercial Pesticide Applicator and utilizes environmentally friendly pesticides and other integrated treatment methods (i.e., hand pulling, weed-steaming, mowing) to control weeds for various habitat restoration projects as well as for small municipalities. Rea sits on the Gilpin County Noxious Weed Advisory Board and has helped to develop the Gilpin County and the Town of Nederland Noxious Weed Management Plans.

**Ecological Restoration.** Rea has been involved in numerous ecological restoration projects. She regularly aids in developing concept restoration plans, review of final engineering plans, and designs seed mixes and planting plans. Ms. Orthner also supervises and actively installs vegetation materials for the restoration sites. Finally, she conducts annual monitoring and maintenance including integrated weed control for restoration projects.

**Project Management.** Ms. Orthner has experience in project management, including managing the On-Call Ecological Services Team for Pitkin County Open Space and Trails in Colorado and leading a Wetlands Team for the Ecological Integrity Assessment in Boulder County, Colorado.

**References.** References are available upon request. Please contact me: [rea@peakecological.com](mailto:rea@peakecological.com)