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Attorneys for Plaintiffs

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF IDAHO

IDAHO CONSERVATION LEAGUE, IDAHO RIVERS UNITED, and GOLDEN EAGLE AUDUBON SOCIETY *Plaintiffs*, vs. U.S. FOREST SERVICE *Defendant*.	No. 1:16-cv-25-EJL **DECLARATION OF ROGER ROSENTRETER**

I, Roger Rosentreter, declare as follows:

My name is Roger Rosentreter. I reside in Boise, Idaho. I am personally aware of the matters set forth below, and if called as a witness, I would and could truthfully testify thereto.

Statement of Qualifications and Basis for Testimony

1. I am a 1974 graduate of the University of Montana, where I earned a BA in Botany/Biology. I also have an MA in Biology from Clark University in 1976 and a Ph.D. in Botany from the University of Montana in 1984.

2. For more than 33 years, I worked as a botanist for the Department of Interior's Bureau of Land Management (BLM), and spent most of my later career in the BLM's Idaho State Office. I retired in January 2013. Although I was based in Boise for my entire BLM career, I typically worked both statewide and at the regional level, in the latter capacity most often as a vegetation scientist and educator.

3. Throughout my career, I performed a variety of programmatic and field-oriented botanical and vegetation science-based tasks. I administered the multi-district botany and weed programs for the twelve million acres managed by BLM in Idaho, taught courses for the Bureau's National Training Center in Phoenix, Arizona, conducted rare plant field inventories and monitored rare plant populations, and served as a team member in the preparation of numerous Environmental Assessments and Environmental Impact Statements (including serving as the lead for the lichen and bryophyte assessments for the President's Forest Ecosystem Management Assessment Team - FEMAT).

4. I authored numerous technical reports, and published more than 75 peer-reviewed papers or book chapters (see attached Curriculum Vitae).

5. During my career and continuing into retirement, I have collected more than 19,000 plant specimens, the vast majority being lichens. Duplicates of these specimens have been donated to scientific institutions (herbaria) around the world, with whom I have collaborated. Through my exploration of botanical resources around the U.S., I have observed

thousands of species, common and rare, including the U.S. Forest Service sensitive plant species, Sacajawea's bitterroot (*Lewisia sacajaweana*). I first observed Sacajawea's bitterroot on the Boise National Forest in the 1990s, before molecular analysis helped determine that it was separate and distinct from California's Sierra Nevada endemic Kellogg's bitterroot (*Lewisia kelloggii*). Through my 20+ year participation on Idaho's Interagency Rare Plant Working Group, I was informed and educated about all rare Idaho plant species, regardless of land ownership or management. This includes Sacajawea's bitterroot.

6. I am familiar with the scientific literature regarding *Lewisia sacajaweana* (Sacajawea's bitterroot), both in general and throughout its limited Idaho range, and with the management, monitoring, biological, and ecological literature of other Idaho native and rare plant species. I have observed Sacajawea's bitterroot in its natural (in situ) habitat, and also in experimental propagation containers (ex situ) at the Idaho Botanical Garden in Boise.

7. I have reviewed the USDA Forest Service's Supplemental Decision Notice and Finding of No Significant Impact (SDN/FONSI) (September 2015) and the Supplemental Environmental Assessment (SEA) (March 2015) for the CuMo Exploration Project. I have also reviewed the CuMo Exploration Project Reclamation Plan (prepared by Forsgren Associates Inc., June 2011), the *Lewisia sacajaweana* 2012 Monitoring Plan: Final Report (prepared by Conservation Seeding & Restoration, Inc., November 2012), Field Surveys for Sacajawea's Bitterroot (*Lewisia sacajaweana*) in the Central Idaho Mountains: 2013 Progress Report (prepared by Idaho Fish & Game Natural Heritage Program, 2013), and Sacajawea's Bitterroot and Other Sensitive Plant Survey Report (prepared by Tetra Tech, July 2015).

Overview of Sacajawea's Bitterroot And Risk of Irreparable Harm

8. Sacajawea's bitterroot is on the US Forest Service Region 4 sensitive plant species list, and has a NatureServe conservation rank of G1/S1 (Global 1, State 1), implying imperilment due to extreme rarity, or because other factors demonstrably make it very vulnerable to extinction. This is the highest rank (expressing the deepest concern) possible for a species. This diminutive plant, which typically spends less than 6 weeks above ground, is restricted to a swath across Idaho's central mountains, with populations known from the Boise, Trinity, Sawtooth, Salmon River, and Bighorn Crag mountain ranges. Its entire known distribution encompasses an area approximately 120 miles long by 75 miles wide, and includes portions of the Boise, Payette, Salmon-Challis, and Sawtooth National Forests (Mancuso et al. 2013). Sacajawea's bitterroot is known from approximately 39 Element Occurrences (EOs; or occurrences) in Idaho, with the largest number located on the Boise National Forest. This Boise National Forest population represents 80 percent or more of the global population of this species.

9. Based on my academic background and professional experience working as a botanist in Idaho (as outlined above and in my CV) for nearly forty years, my knowledge of the species and its habitat and other requirements and distribution, and my review of the above listed documents, it is my opinion that the proposed CuMo Exploration Project poses a definitive risk to the long-term survival of the narrow endemic plant, Sacajawea's bitterroot. If the CuMo Exploration Project goes forward under the Forest Service's current authorization, in my opinion there will be serious risks of irreparable harm caused to the Sacajawea's bitterroot population in the Project area, through the various impacts discussed below. Because that population is so important to the species across its limited range, this harm poses very real threats to the future health and survival of the species.

The Project's Adverse Impacts to Sacajawea's Bitterroot

10. According to the SEA, many of CuMo's approved exploration activities (road building, drill pad construction, regular vehicle travel and maintenance) can adversely affect Sacajawea's bitterroot populations by causing direct destruction, habitat fragmentation, introducing and spreading non-native invasive weeds, and otherwise degrading plant habitat and disrupting critical pollinators. I agree with this information, although I do not agree with the Forest Service's illogical conclusion that potential adverse impacts here will be "insignificant" to Sacajawea's bitterroot, as explained below.

11. Based upon my personal experience and my review of the Project documents, Sacajawea's bitterroot plants can be directly destroyed when soil with plants is dug up, cleared away, or covered with other soil to build and maintain roads or drill pads. Sacajawea's bitterroot plants can also be crushed when vehicles drive over them.

12. Constructing new roads and drill pads, and reopening and maintaining closed roads and old drill pads, causes habitat fragmentation. Habitat fragmentation is the process by which habitat loss results in the division of large, continuous habitats into progressively smaller patches of smaller total area isolated from each other by a matrix of habitats unlike the original.

13. Habitat fragmentation will potentially harm Sacajawea's bitterroot by the introduction of competitive, invasive plants to the habitat; by modification of the soil substrate such that plants have difficulty germinating, growing, and recruiting new individuals into the population; and by alteration and disruption of ecosystem processes such as pollinator visitation. Insect pollinators are essential for this species to produce seed, as it is not pollinated by other means (i.e., wind, self).

14. Constructing and maintaining roads and drill pads, and driving vehicles at the Project site, foster the spread of invasive plants and noxious weeds. Roads and trails serve as invasion corridors for plants that are not native to a region, including those that are invasive or noxious, which can have severe, long-term impacts on ecosystem conditions and processes. Non-native plants are those that are introduced with human help (intentionally or accidentally) to a new place or new type of habitat where they were not previously found (not all non-native plants are invasive). Invasive plants are those that are both non-native and able to establish on many sites, grow quickly, and spread to the point of disrupting plant communities or ecosystems. Noxious weeds are particularly troublesome. They include any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment. The State of Idaho and USDA APHIS (Animal and Plant Health Inspection Service) each maintain a list of noxious weeds, which are illegal to transport across state lines.

15. At the Project site, invasive (including noxious) plant seeds moved by vehicles and construction equipment would readily colonize disturbed areas and roadsides, and could eventually spread into Sacajawea's bitterroot habitat, competing for space and resources. Open disturbed sites are also more susceptible to invasion by wind borne seed. Because Sacajawea's bitterroot is diminutive, ephemeral, and grows in sparsely vegetated sites, it could easily be outcompeted by these taller, more aggressive non-native plant species that have a much longer growing season, and consequently, a greater opportunity to spread into new areas.

16. Although the Forest Service states that it will require CuMo to use high pressure washing systems to clean all construction equipment of noxious weed seeds, plants, dirt, and

debris, this construction equipment does not include cars, pickup trucks, and other vehicles that regularly travel between the construction site and areas outside of national forest lands.

17. Pollinators, including those of Sacajawea's bitterroot, are also harmed by these same activities. While we don't yet know what type(s) of insect(s) pollinates this rare bitterroot, it cannot produce the seed necessary to recruit new plants without this critical step in its biology. Sacajawea's bitterroot requires insect visitation to transfer pollen (due to the plant's small size, other pollinating organisms, such as birds and bats, can be ruled out). Pollination is the act of transferring pollen grains from the male anther of a flower to the female stigma. The goal of every living organism, including plants, is to create offspring for the next generation. One of the ways that plants can produce offspring is by making seeds which contain the genetic information to produce a new plant. Flowers are the tools that plants use to make their seeds and these can only be produced when pollen is transferred between flowers of the same species.

18. The surface disturbance associated with building and maintaining roads and drill pads can destroy insect pollinator nests and can destroy and fragment habitat that these pollinators depend on. Invasive plants can also degrade pollinator habitat, as can the dust generated by vehicle travel and construction activities.

The Forest Service's Flawed Analysis of Impacts to Sacajawea's Bitterroot

19. While the SEA states that many of CuMo's approved exploration activities would directly and indirectly harm Sacajawea's bitterroot plants and its habitat, and disrupt pollinators, it then goes on to state that the project will have only minimal, unspecified impacts to Sacajawea's bitterroot. This analysis is flawed, incomplete, and inaccurate in my opinion.

20. Importantly, the SEA does <u>not</u> estimate how many acres of roads and drill pads would be built in occupied and suitable Sacajawea's bitterroot habitat, or in pollinator habitat.

The amount of vehicle travel and other dust-generating activities that would occur in occupied and suitable Sacajawea's bitterroot habitat is also not estimated.

21. In my opinion, without this information, the Forest Service had no basis for a quantified or detailed analysis of impacts, and no basis for asserting that impacts are likely to be insignificant. Sacajawea's bitterroot typically grows on the ridges and adjacent downslopes that likely provide some of the most preferable road corridors and drill pad sites; and as approved in the SEA and SDN/FONSI, CuMo may build new roads and drill pads, reopen existing closed roads, and drive vehicles in both occupied and suitable Sacajawea's bitterroot habitat. Given this, I see no scientific or logical basis for the Forest Service to conclude that impacts to Sacajawea's bitterroot could range from "no impact" to "may impact individuals, but would not likely contribute to a trend toward federal listing or loss of viability of populations or species."

Significant Adverse Impacts to Sacajawea's Bitterroot

22. In my opinion, the Project is likely to have substantial adverse and irreparable impacts to Sacajawea's bitterroot at the site and to the species as a whole if CuMo proceeds with exploration activities in occupied or potential habitat. Due to the large size of the population within the CuMo Project Area relative to other Idaho occurrences, these impacts could result in a significant loss of this species' genetic variability. The Forest Service itself notes that the CuMo site "is considered to be a stronghold for the species' future persistence", and warns that the CuMo population "remains at risk of extirpation from stochastic events including human disturbance and environmental stressors in the future.

23. In addition to the multiple risks from CuMo's exploratory activities, a large wildfire (Grimes Fire) burned through the site, including Sacajawea's bitterroot habitat, in July 2014. A potentially greater threat than the fire itself was the fire line construction. Fire lines are

notorious conduits for weed invasion. They can open up otherwise intact habitats to the spread of invasive plants from either the equipment used in fire line construction, or to wind borne invasive or even noxious weed seeds at a later date (ie. rush skeletonweed, various knapweeds, etc.). Additional unknowns since the 2014 fire include whether seeding was performed in an effort to restore the fire line, and if so, whether those restoration species themselves could "invade" Sacajawea's bitterroot habitat, and the impact the fire and fire line construction had on the population. Essentially, the Sacajawea's bitterroot population baseline is no longer known within the Project Area.

24. Given that as much as 75% of the known population at the Project site was affected by the fire and fire line construction, since both occurred within the densest Sacajawea's bitterroot habitat, it is imperative, in my opinion, to resurvey the site to establish a new baseline prior to approving the Project. Without knowing whether or to what extent plants and habitat survived the fire and fire-fighting activities, the Forest Service had no basis for evaluating the potential impacts of CuMo's exploration activities and was simply guessing. The importance of re-establishing this baseline cannot be overstated. It is not possible to analyze impacts to Sacajawea's bitterroot without knowing its current status within the Project area.

25. Furthermore, knowing where plants survived the fire is essential to avoiding and mitigating impacts of the Project and ensuring that no additional Sacajawea's plants or colonies are lost. For example, if areas of occupied habitat were significantly degraded or destroyed (which likely occurred based on the fire line construction alone, and may have also occurred due to the fire), then it is imperative to protect remaining areas of occupied habitat by prohibiting or limiting exploration activities in and near those areas. If areas of suitable habitat were rendered

uninhabitable by the fire or fire-fighting, then preserving the remaining suitable habitat may be critical to preserving the species.

26. I agree with the findings in the SEA that the Plant Conservation Area (PCA) consists of areas that are "essential" to the conservation of this species, and that there is a "need" to protect all occupied and potential habitat at the site. However, I do not agree with the Forest Service's apparent conclusion that the Project's mitigation measures will protect the PCA and the potential habitat that has been mapped outside of the PCA.

27. While the SEA includes mitigation measures that ask CuMo to try to avoid activities such as road use, maintenance, construction/relocation, and drill pad construction within Sacajawea's bitterroot PCA, this is not absolute. Under the mitigation measures, if CuMo determines that drill pad construction or other exploration activities are necessary within a PCA, and that avoidance is not practicable, they can continue.

28. When CuMo does undertake exploration activities in the PCA, there are mitigation measures in place that the Forest Service hopes will minimize the adverse impacts; however, even with these measures (which may indeed reduce the impacts), there will still be very real adverse impacts. For example, any surface disturbance in the PCA, such as road or drill pad construction, will at a minimum destroy or seriously degrade "essential" plant and/or pollinator habitat. Even maintaining and using the existing but currently closed roads that are found throughout the PCA while adhering to the mitigation measures has impacts too, including generating dust, facilitating the spread of noxious weeds, and possibly crushing plants and degrading habitat on or adjacent to these roads.

29. Under the mitigation measures, when impacts cannot be avoided, the Forest Service botanist or other qualified individual will be required to document, through a checklist

process, that the location of the activity and techniques used to minimize impacts were sufficient to not change the current effects determination disclosed in the SEA. If the botanist determines that the effects determination would change, the Responsible Official will evaluate whether or not the new information or changed circumstances constitute unforeseen significant surface disturbance that would require modification of the plan of operations. If effects would be outside the scope and range of effects considered in the original analysis, correction, supplementation or revision of the SEA may be required to support modification of the plan of operations. However, the SEA does not disclose the amount of exploration activity the Forest Service anticipated CuMo would perform in the PCA when the agency evaluated the potential effects and concluded there would be little, or even "no impact" to Sacajawea's bitterroot, making it unclear what the Forest Service would consider to be effects that are outside the scope and range of the what was considered in the EA. In my opinion, allowing any surface disturbance in the PCA will have effects that go beyond the finding of no to small impacts disclosed in the SEA.

30. Additionally, CuMo is not required to try to avoid potential habitat outside of the PCA or to follow the same minimization measures unless plants are first found there. Over 200 acres of the Project site outside of the PCA has been modeled to be potential habitat. It is not known whether plants exist in potential habitat outside of the PCA. Given Sacajawea's bitterroot critically imperiled status, and since the PCA is home to more Sacajawea's bitterroot than anywhere in the world, protecting these nearby areas of potential habitat is important. Allowing roads and drill pads and other exploration activity in potential habitat outside the PCA will destroy and/or degrade potential habitat, which has potentially significant impacts to the survival of the species at the Project site.

31. I have reviewed the July 2015 Tetra Tech Survey Report, which indicates that CuMo intends to locate numerous drill pads and some road segments in the PCA and in or near other potential Sacajawea's bitterroot habitat. In my opinion, allowing any of these activities to proceed within the PCA or in potential habitat outside the PCA will have real, adverse impacts to plants, pollinators, and their habitat at the Project site, even if the Project's mitigation measures are followed.

32. In summary, in my expert opinion, the Forest Service's approval of the CuMo Project is not based on adequate information, since it is imperative that new surveys are conducted to establish the impacts of the 2014 fire and fire lines on the population of Sacajawea's bitterroot in and around the Project area; and further, that the Forest Service's approval of exploration activities include road and drill pad construction and vehicle traffic poses significant threats of adverse impacts to the remaining populations of Sacajawea's bitterroot at the site. Because of the importance of the populations at the Project site to the overall health of the species, it is imperative that Project activities not be authorized to proceed until adequate information and accurate analysis are provided by the Forest Service, in order to avoid the high likelihood (if not certainty) of irreparable harm occurring to the species.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct, executed this 4th day of April, 2016, at Boise, Idaho.

/s/ Roger Rosentreter
Roger Rosentreter, Ph.D.

Curriculum Vitae

Roger Rosentreter
2032 S. Crystal Way, Boise, Idaho 83706
E-mail roger.rosentreter0@gmail.com

Degrees

B.A. Botany/Biology	1974	University of Montana, Missoula, MT
M.A. Biology	1976	Clark University, Worcester, MA
Ph.D. Botany	1984	University of Montana, Missoula, MT

Most recent Position

Teaching field workshops in Idaho for the Idaho Dept. of Fish and Game on sage-grouse food habits. Spring/summer 2014 - 2015.

Academic Affiliation

Teaching Assist. 1974-1976 Clark University, Worcester, MA. Courses taught: Plant Taxonomy (2x), General Biology, Botany of the Maine Coast.

Teacher 1976-77 Secondary Science, Browning, MT. Biology and Earth Science, cross-country and track coach.

Teaching Assist. 1979-84 Univ. of MT, Missoula. Courses taught: Plant Taxonomy, Plant Physiology, Agrostology, Genetics, General Biology, General Botany.
1980-1983 summers, Univ. of MT Biological Station, Flathead Lake.
Courses taught: Plant Ecology, Mycology, Lichenology.

Instructor/ Adjunct Faculty 1985-present, Biology Dept., Boise State Univ., Boise, ID
Courses taught: Wildlife Management, Subtropical Field Biology, Ecology of the Boise River, Plants of the Boise Foothills, Graduate Seminar, Aquatic Ecology.
Directed independent study in: Herbarium Curation Techniques, Lichen Ecology, Edible Plants.
Occasional substitute for General Botany, Mycology, Plant Systematics, Mammology

Instructor 1985-1989 Physical Education Dept., Boise State Univ., Boise, ID.
Courses taught: Flatwater and Whitewater Canoeing.
2001-2012 Horticulture Program, BSU, Landscaping with Native Plants.

Graduate Faculty Committee Member

1988-present, Boise State Univ., Boise, ID; Idaho State Univ., Pocatello, ID; U of ID, Moscow, ID; Brigham Young University, Provo, and UT; Utah State University, Logan, UT, ten completed M.S. students, four completed PhD students.

Herbarium lichen/bryophyte herbarium at BSU, approximately 20,000 specimens donated. http://symbiota.org/nalichens/collections/index.php

Other Teaching Experience

Instructor Trainer Certified by the American Canoe Association to teach canoeing

Instructor Bureau of Land Management interagency courses: Rare Plant Monitoring Techniques, the Endangered Species Act, Ecology and Management of Biological Soil Crusts, Sagebrush Ecology and Identification

Ski Instructor Recreation Unlimited, Physically Challenged Skiers Program, Bogus Basin Recreation Area, Boise, ID

Professional Service

Chairman
Idaho Interagency Rare Plant Working Committee 1989-1994
Society of Range Management - Idaho Rangeland Reference Area Committee 1980-1994
ID Weed Coordinating Committee 2005-2007
Idaho Weed Hall of Fame recipient 2008

Board Member
Former President, American Bryological and Lichenological Association
Idaho Weed Control Board 1989-1991
Northwest Scientific Association 1994-1999
Pahove Chapter, Idaho Native Plant Society 1985-1989

Member
USFS (Idaho) Old Growth Forest Definition Team
NRCS Riparian Plant Improvement Advisory Committee
International Forest Health Monitoring Program for Eastern Europe
President's Forest Ecosystem Management Assessment Team (FEMAT) lead for lichen and bryophyte assessments

Peer-reviewed Journal Publications

1973 Sheridan R.P. and R. Rosentreter The effect of hydrogen ion concentrations in simulated rain on the moss *Tortula ruralis* (Hedw.) Sm. The Bryologist Vol. 76:1:168-173.

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of the Symposium: Biology of *Artemisia* and *Chrysothamnus*. Gen. Tech. Report INT-200, Ogden, UT.

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1991 Rosentreter, R. and R.G. Kelsey. Xeric big sagebrush, a new subspecies in the *Artemisia tridentata* complex. Journal of Range Management 44:330-335.

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1992 Owen, W.R. and R. Rosentreter. Monitoring rare perennial plants: techniques for demographic study. Natural Areas Journal 12:32-38.

1992 McCune, B. and R. Rosentreter. Distribution and abundance of a rare lichen species, *Texosporium sancti-jacobi*. The Bryologist 95:329- 333.

1993 Stolte, K. et al. Lichens as bioindicators of air quality. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, Gen. Tech. Rep. RM-224. Fort Collins, CO. 131 p.

1993 Rosentreter, R. Vagrant lichens in North America. The Bryologist 96:333-338.

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1993 Thomas, J.W. et al. Forest ecosystem management: an ecological, economic, and social assessment. Report of the Forest Ecosytem Management Assessment Team, USDA Forest Service, Portland, Oregon.

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Professional Organizations

American Bryological and Lichenological Society (President 2011-2014)
International Lichenological Association
Northwest Lichenologists
North American Mycological Society
Northwest Scientific Association (former board member)
Idaho Chapter of the Wildlife Society