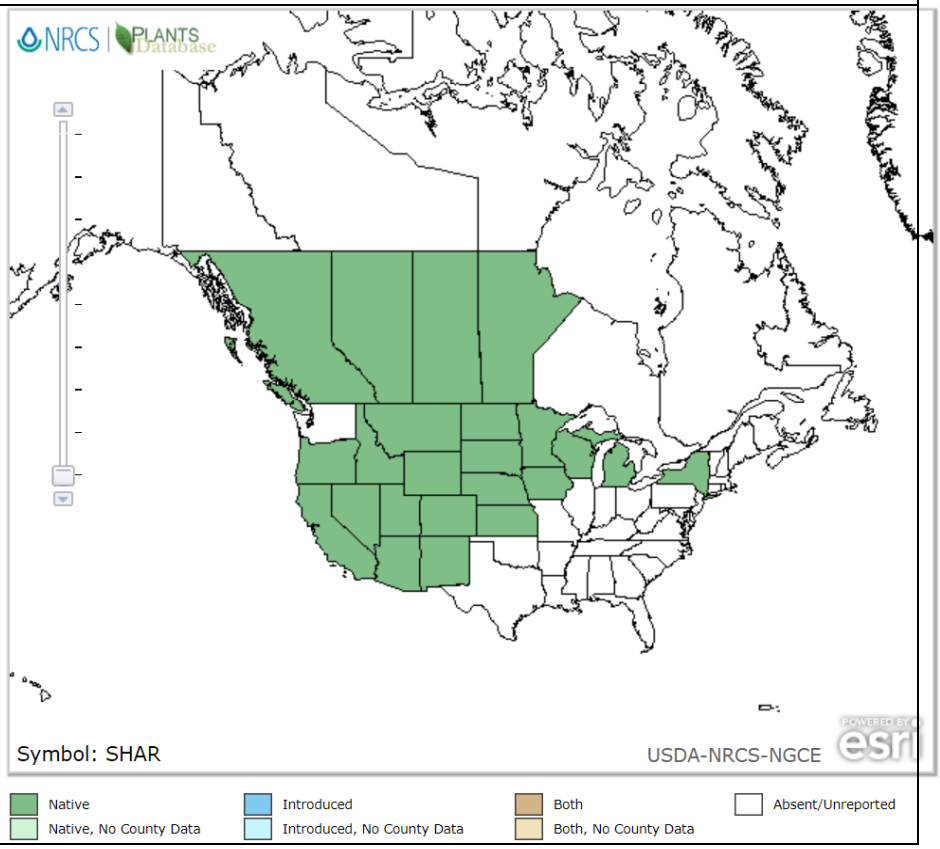
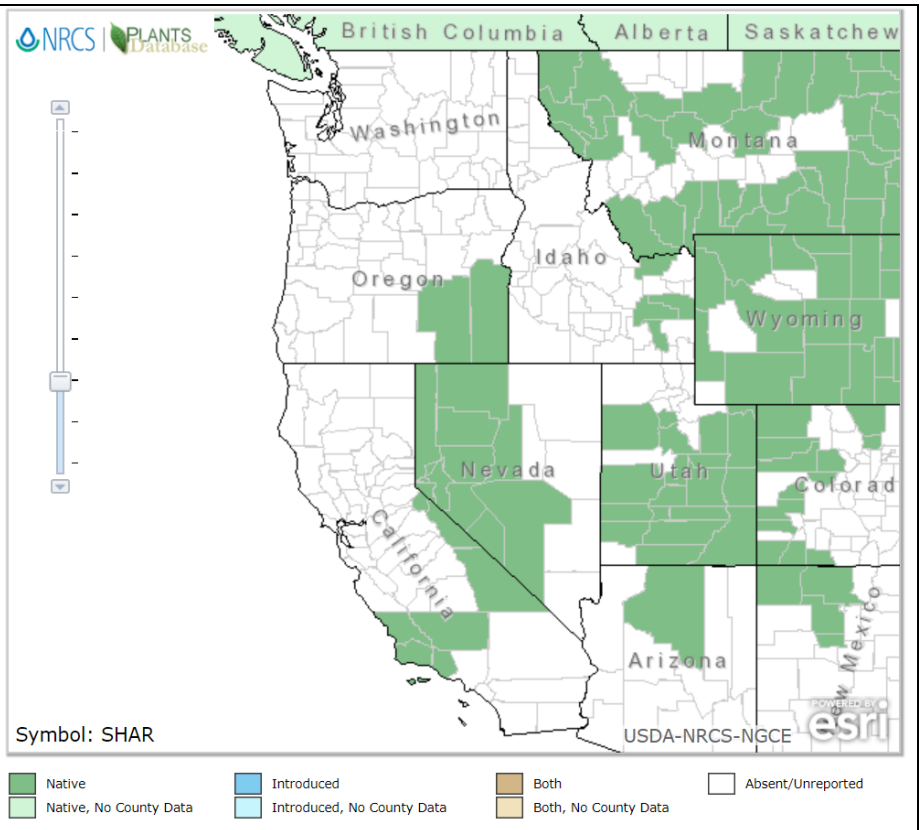
Plant Propagation Protocol for *Sheperdia argentea*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/*SHAR.pdf*

TAXONOMY	
Plant Family	
Scientific Name	Elaeagnaceae
Common Name	Oleaster Family
Species Scientific Name	
Scientific Name	*Sheperdia argentea* (Pursh) Nutt.
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	*Eleagnus utilis* A. Nelson *Lepargyrea argentea* (Pursh) Greene
Common Name(s)	Buffaloberry, bullberry, redberry, silverberry, silver buffaloberry (Knudson, 2006)(U.S. Department of Agriculture, Forest Service, 1974, p. 771)
Species Code (as per USDA Plants database)	SHAR
GENERAL INFORMATION	
Geographical range	

	 (USDA NRCS NGCE, n.d.)
Ecological distribution	Mainly a prairie plant (Knudson, 2006).
Climate and elevation range	Occurs in a range of elevations up to 7,500 ft in locations that get 15-20 inches of rain annually (Bonner & Karrfalt, 2008, p. 1043)(USDA NRCS Plant Materials Program, 2002).
Local habitat and abundance	*S. argentea* occurs in moist, well-drained regions, ideally with full sun (Knudson, 2006).
Plant strategy type / successional stage	*S. argentea* is adapted to a number of stresses. It has "strong grazing resistance" (Bonner & Karrfalt, 2008, p. 1043); it grows rapidly, can resprout if coppiced, and can spread by suckers. It can also fix nitrogen and tolerate a significant amount of salinity (USDA NRCS, n.d.)(Knudson, 2006).
Plant characteristics	Shrub or tree. Lifespan between 100 and 250 years (USDA NRCS, n.d.)
PROPAGATION DETAILS	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Bareroot
Stock Type	N/A
Time to Grow	1.5 to 2.5 years depending on seed treatment
Target Specifications	Transplant seedlings "after two growing seasons" (Knudson, 2006).
Propagule Collection	The fruits ripen to an orange-red color between June and September,

Instructions	and can be harvested using a variety of methods, including placing canvas on the ground and flailing seeds off the bush, using mechanical shakers, collecting already fallen seeds, or picking by hand. Sturdy gloves are recommended due to the thorns. (Bonner & Karrfalt, 2008, p. 1044))(U.S. Department of Agriculture, Forest Service, 1974, p. 771) (Young & Young, 1992, p.321)(Young & Young, 1986, p. 132)
Propagule Processing/Propagule Characteristics	*S. argentea* seeds are orthodox (Bonner & Karrfalt, 2008, p. 1045). Seed density is about 40,000 per pound once cleaned (Dirr & Heuser, 2006, p. 326).
Pre-Planting Propagule Treatments	To clean *S. argentea*: use an air-screen cleaner to remove debris from the fruit. Put water in a macerator, use macerator on the fruit, then dry the fruit. Once dried, lightly chop fruit or rub apart with your hands and then put the fruit through the air-screen again to remove the seeds. *S. argentea* seeds are orthodox, and can be safely stored for up to 5 years in a dry location at 5C. Heating the fruit is to be avoided (Bonner & Karrfalt, 2008, p. 1044-1045)(Young & Young, 1992, p. 321). Bonner & Karrfalt suggest several germination treatment options, depending on desired schedule and percent germination. Planting without treatment is possible, and is reported to yield 94 percent germination, but germination will not occur until after 170 days of moist chill at 3C. Putting the seeds through moist chill at 3C for 90 days, planting them, and putting them in 20-30C conditions for 18 days is reported to yield 93 percent germination. The fastest method is to soak seeds in sulfuric acid for 20-30 minutes, plant, and put them in 20-30C conditions for 21 days; however, the germination of this method is reported to be as low as 71-86 percent. (Bonner & Karrfalt, 2008, p. 1045)(Emery, 1988, p. 95). The optimal seed treatment might be a combination of both scarification and stratification (Kruckeberg, 1996, p. 123)(Young & Young, 1986, p. 132).
Growing Area Preparation / Annual Practices for Perennial Crops	Seeds can be planted outdoors in September, ¼ to ½ in deep, and bareroot seedlings 4 to 6 feet apart. The location must have at least 13 inches of precipitation annually. Weeds should be removed, and the area may be mulched to facilitate this. Planting seeds directly at restoration site may be successful. Plant during spring if treated for germination, or fall if not. (Knudson, 2006)(Young & Young, 1992, p. 322).
Establishment Phase Details	N/A
Length of Establishment Phase	Varies depending on treatment of seeds. See “Pre-Planting Propagule Treatments” section above.
Active Growth Phase	N/A

Length of Active Growth Phase	N/A
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	Remove weeds from planting site and continue to do so for about 2 years, until plants are established. If there's anywhere you don't want *S. argentea* to spread, it will be necessary to cut back its suckers to prevent rooting as it can be a vigorous spreader. Plants will begin to grow seeds after 4 to 6 years (USDA NRCS Plant Materials Program)(Young & Young, 1992, p. 321).
Other Comments	"White heart rot disease is a common problem on older plants" and pruning is recommended to slow damage (Knudson 2006). Several sources suggested that cuttings, especially root cuttings, would be successful (Kruckeberg, 1996, p. 123)(U.S. Department of Agriculture, Forest Service, 1974, p. 773)., but others reported little success with cuttings (Dirr & Heuser, 2006, p. 326), and not enough information was available to compile a protocol.
INFORMATION SOURCES	
References	Bonner, F. T., & Karrfalt, R. P. (2008). *The Woody Plant Seed Manual* (Vol. 727, Agriculture Handbook). Washington, D.C.: U.S. Dept. of Agriculture, Forest Service. Dirr, M. A., & Heuser, C. W., Jr. (2006). *The Reference Manual of Woody Plant Propagation: From Seed to Tissue Culture*. Cary, NC: Varsity Press. Emery, D. E. (1988). *Seed Propagation of Native California Plants*. Santa Barbara, California: Santa Barbara Botanic Garden. Knudson, M. (2006, February 13). Silver Buffaloberry: Sheperdia argentea (Pursh) Nutt. Retrieved May 15, 2018, from https://plants.usda.gov/plantguide/pdf/pg_shar.pdf Kruckeberg, A. R. (1996). *Gardening with Native Plants of the Pacific Northwest: Second Edition, Revised and Enlarged*. Seattle, WA: University of Washington Press. U.S. Department of Agriculture, Forest Service. (1974). *Seeds of Woody Plants in the United States* (Vol. 450, Agriculture Handbook). Washington, D.C.: U.S. Dep. Agric.

	USDA NRCS. (n.d.). Conservation Plant Characteristics for Sheperdia argentea. Retrieved May 15, 2018, from https://plants.usda.gov/java/charProfile?symbol=SHAR USDA NRCS NGCE. (n.d.). *Plants Database: SHAR* [Map]. Retrieved May 15, 2018, from https://plants.usda.gov/core/profile?symbol=SHAR USDA NRCS Plant Materials Program. (2002, February 05). Silver Buffaloberry: Sheperdia argentea (Pursh) Nutt. Retrieved May 15, 2018, from https://plants.usda.gov/factsheet/pdf/fs_shar.pdf Young, J. A., & Young, C. G. (1986). *Collecting, Processing and Germinating Seeds of Wildland Plants*. Portland, OR: Timber Press. Young, J. A., & Young, C. G. (1992). *Seeds of Woody Plants in North America, Revised and Enlarged Edition*. Portland, OR: Discorides Press.
Other Sources Consulted	Rose, R., Chachulski, C. E., & Haase, D. L. (1998). *Propagation of Pacific Northwest Native Plants*. Corvallis, OR: Oregon State University Press.
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