	Phalaris arundinacea (Reed canary grass)	Answer	Score
1.01	Is the species highly domesticated?	?	
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to US climates (USDA hardiness zones; 0-low, 1-intermediate, 2-high).	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high).	2	
2.03	Broad climate suitability (environmental versatility).	y	1
2.04	Native or naturalized with mean annual precipitation of 11-60 inches.	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range.	y	2
3.02	Garden/amenity/disturbance weed	y	2
3.03	Weed of agriculture		
3.04	Environmental weed	y	4
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	n	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	n	-1
4.05	Toxic to animals	y	1
4.06	Host for recognised pests and pathogens	?	
4.07	Causes allergies or is otherwise toxic to humans.	y	1
4.08	Creates a fire hazard in natural ecosystems	?	
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.10	Grows on any soil order representing >5% cover in the US.	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	y	1
5.01	Aquatic	n	0
5.02	Grass	y	1
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	y	1
6.01	Evidence of substantial reproductive failure in native habitat		
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally	y	1
6.04	Self-compatible or apomictic	n	-1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	y	1
6.07	Minimum generative time (years)	1	1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y	1
7.02	Propagules dispersed intentionally by people		
7.03	Propagules likely to disperse as a produce contaminant		
7.04	Propagules adapted to wind dispersal		
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed		
7.07	Propagules dispersed by other animals (externally)	y	1
7.08	Propagules dispersed by other animals (internally)		
8.01	Prolific seed production	y	1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	?	

8.03	Well controlled by herbicides	?	
8.04	Tolerates, or benefits from, mutilation or cultivation	y	1
8.05	Effective natural enemies present in the contiguous US and Alaska		
	Total Score	**25**	
	Implemented Pacific Second Screening	**no**	
	Risk Assessment Results	**High Risk**	

	Reference	Source data
1.01	1. Pasture Picker Phalaris factsheet (http://www.pasturepicker.com.au/Html/Phalaris.htm[accessed 31 Dece 2013]) 2. CISRO Plant Industry (www.csiro.au/files/files/p2px.pdf [accessed 9 Jan 2014]). 3.Wisconsin Reed Canary Grass Management Working Group (2009) Reed Canary Grass (Phalaris arundinacea) Management Guide: Recommendations for landowners and restoration professionals. PUB-FR-428.	Although many cultivars have been developed, there is no evidence that these cultivars are selected to reduce invasive traits. Much breeding effort has been put into such characteristics as drought, flood, and seasonal tolerance. 1. Cultivars developed to retain seeds in the head. 2.CISRO has developed cultivars for winter active plants (Holdfast), semi-winter activity (Australian II) drier areas (Atlas PG), marginal soils (Landmaster) and in general these newer cultivars of phalaris retain seed firmly in the heads until full maturity. These cultivars have also been developed to reduce phalaris toxicity. 3. RCG had a high degree of genetic variability and more than 115 artificially selected genotypes have been developed.
1.02		skip to 2.01
1.03		skip to 2.01
2.01	1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org [accessed 15 Jan 2014]). 2.Discover Life Map of Phalaris (http://www.discoverlife.org/mp/20m?kind=Phalaris [accessed 15 Jan 2014]) 3. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?310864). 4. Dave's Garden (http://davesgarden.com/guides/pf/go/1582/[accessed 15 Jan 2014])	No computer analysis was performed. Global distribution, appears to be present in almost all zones. USDA Plant Hardiness zones 3b-9a.
2.02	1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org [accessed 15 Jan 2014]). 2.Discover Life Map of Phalaris (http://www.discoverlife.org/mp/20m?kind=Phalaris [accessed 15 Jan 2014]) 3. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?310864). 4. Dave's Garden (http://davesgarden.com/guides/pf/go/1582/[accessed 15 Jan 2014])	No computer analysis was performed. Global distribution, appears to be present in almost all zones. USDA Plant Hardiness zones 3b-9a.
2.03	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf).	See source data for 2.01. 1. Cosmopolitan distribution includes more than 3 zones.
2.04	1. (World Climate Maps. http://www.climate-charts.com/World-Climate-Maps.html. Accessed 14 Jan 2013]). 2. USDA Plants database (http://plants.usda.gov/core/profile?symbol=PHAR3 [accessed 13 Jan 2014]). 3. Range Plants of Utah: Reed Canarygrass. Extension Utah State University (https://extension.usu.edu/rangeplants/htm/reed-canarygrass [accessed 17 Jan 2014]).	Global distribution. 1 & 2. In United States alone, Phalaris grows in zones receiving between 5 and 58 inches of rain. 3. "in the U.S., it grows where annual precipitation ranges from 35-65” per year but in generally arid to semiarid Utah, it is essentially restricted to disturbed riparian areas and wetlands."
2.05	1. Apfelbaum and Sams (1987) Ecology and control of reed canary grass (Phalaris arundinacea L.). Nat. Areas J. 7:69-74. 2. Merigliano and Lesica (1998) The native status of reed canary grass (Phalaris arundinacea L.) in the inland northwest, USA. Nat Area J 18:223-230.	1. Some populations are thought to be native to North America, but is more widely distributed through deliberate introductions in agricultural areas. 2. Modern populations of P. arundinacea may be a mixture of agronomic cultivars and native material.

3.01	1. Howell and Sawyer (2005) New Zealand naturalised vascular plant checklist. New Zealand Plant Conservation Network, Wellington. 60 p. (www.nzpcn.org.nz/publications/Naturalised-list-06-new.pdf [accessed 5 Jan 2014]) 2. Holm, Plucknett, Pancho, and Herberger (1977) The World's Worst Weeds: Distribution and Biology. The University Press of Hawaii, Honolulu. 3. Robert W. Freckmann Herbarium, University of Wisconsin (http://wisplants.uwsp.edu/scripts/detail.asp?SpCode=PHAARU [accessed 14 Jan 2014]). 4. Invasive Plant Atlas of New England (http://www.eddmaps.org/ipane/ipanespecies/grass/phalaris_arundinacea.htm [accessed 14 Jan 2014]).	Evidence that some cultivars are naturalizing, but P. arundinacea is considered native to North America. 1. Listed as fully naturalized in New Zealand. 2. Listed as serious weed in Afghanistan, Hungary, and Japan; a principal weed in multiple countries including Poland, New Zealand, Korea; Common weed in Italy, Portugal, and the US; present as a weed in multiple coutries including Germany Canada, Findland, Sweden; and listed in the floras of Australia, India, Hawaii (etc.). 3. Naturalized in Wisconsin (listed as ecologically invasive) 4. European cultivars were introduced in the early 1800 as forage grasses. Phalaris arundinacea is a circumboreal species that is native to North America as well as Europe. It is found throughout Canada. In the United States, it is present in Alaska, as well as the majority of the continental United States except for a few south/southeastern states. It has been reported from all the states of New England.
3.02	1. Wisconsin Reed Canary Grass Management Working Group (2009) Reed Canary Grass (Phalaris arundinacea) Management Guide: Recommendations for landowners and restoration professionals. PUB-FR-428.	1. Because seeds and vegetative propagules are dispersed by water, RCG can establish and disperse along stream banks and ditch networks.
3.03		No Evidence
3.04	1. Miller & Zedler (2003) Responses of native and invasive wetland plants to hydroperiod and water depth. Plant Ecol 167:57-69. 2. Henderson (1991) Reed canarygrass poses a threat to oak savanna, restoration and maintenance (Wisconsin). Restor Manage Notes 9:32. 3. Galatowitsch et al (1999) Invasiveness in wetland plants in temperate north America. Wetlands 19:733-755. 3. Wisconsin Reed Canary Grass Management Working Group (2009) Reed Canary Grass (Phalaris arundinacea) Management Guide: Recommendations for landowners and restoration professionals. PUB-FR-428.	1. The life history traits of P. arundinaceae have allowed for the aggressive invasion of wetland habitats reducing native species. 2. Can invade and dominate sedge meadows and wet prairies. It may also pose a serious threat to upland oak savannas. 3. Range has increased and is an invasive weed in many wetlands.
3.05	1. Howell and Sawyer (2005) New Zealand naturalised vascular plant checklist. New Zealand Plant Conservation Network, Wellington. 60 p. (www.nzpcn.org.nz/publications/Naturalised-list-06-new.pdf [accessed 5 Jan 2014]). 2. Holm, Plucknett, Pancho, and Herberger (1977) The World's Worst Weeds: Distribution and Biology. The University Press of Hawaii, Honolulu.	1. 5 congeners listed as fully naturalized in New Zealand. 2. Other congeners listed as principal weeds (P minor in Maxico, P. tuberosa Australia).
4.01		No Evidence
4.02	1. Chung and Miller (1995) Allelopathic influence of 9 forage grass extracts on germination and seedling growth of alfalfa. Agronomy Journal 87:767-772.	1. Reed canarygrass (Phalaris arundinacea L.) extracts had no effect on alfalfa seedling emergence and survival.
4.03		No Evidence
4.04	1. CISRO Plant Industry (www.csiro.au/files/files/p2px.pdf [accessed 9 Jan 2014]). 2. Range Plants of Utah: Reed Canarygrass. Extension Utah State University (https://extension.usu.edu/rangeplants/htm/reed-canarygrass [accessed 17 Jan 2014]).	1. Grown and promoted, particularly strains that have been bred with lower alkaloid content, as forage for cattle, sheep, etc. 2. "Reed canarygrass foliage is coarse but it provides good forage prior to maturity. Grazing should begin when the grass is 12 inches tall, and when soils are dry to minimize trampling."

4.05	1. Pasture Picker Phalaris factsheet (http://www.pasturepicker.com.au/Html/Phalaris.htm[accessed 31 Dece 2013]). 2. Binder et al. (2010) Phalaris arundinacea (reed canarygrass) grass staggers in beef cattle. J Vet Diagn Invest 22:802-805. 3. Corcuera (1989) Indole alkaloids from Phalaris and other gramineae. pp. 169-177 in Cheeke ed. Toxicants of Plant Origin. Vol I. Alkaloids. CRC Press, Inc. Boca Raton, FL, USA. 335 pp. 4. Cheeke and Shull (1985) Natural toxicants in feeds and poisonous plants. AVI Publishing Co., Inc., Westport CN, USA. 492 pp. 2. 1. Cheeke (1995) Endogenous toxins and mycotoxins in forage grasses and their effects on livestock.J Anim Sci 73:909-918.	Although it is grown as a pasture crop, there are times when Phalaris can be toxic or fatal to sheep or cattle. 1. Phalaris can cause toxicity in sheep and sometimes cattle due to the presence of alkaloids although problems are rare. Phalaris "staggers" can occur any time when green phalaris is predominant in the diet, classically a few weeks after the break of season. "Sudden death" can result in losses within two days of introducing stock to a phalaris pasture. Losses typically have occurred on new shoots of phalaris after moderate rains in an otherwise dry period. 2. 4 cows from West Virginia presented with weakness, ataxia, limb paresis progressing to lateral recumbency, and death within 2-3 days from Phalaris grass toxicosis. Overall 18 cows dies with similar clinical signs. 3. Several indole alkoloids are present in Phalaris including hordenine, gramine, and 5-methoxy-N-methyltryptamine. 4. Sheep in New Zealand presented symptoms of incoordination, stiff stilted gait, muscle spasms, convulsions, recumbancy, and death with gross lesions found on the nervous system including gray to blue discoloration in the brain stem and yellow brown granules in the cytoplasm of nerve cells. 5. Produces significant amounts of alkaloids reducing palatability to herbivores.
4.06	1. Semeniuk & Mankin (1964) Occurrence and development of Sclerophthora macrospora on cereals and grasses in South Dakota. Phytopathology 54:409-416. 2. Teagasc (2010) Reed Canary Grass Factsheet. (www.teagasc.ie/publications/2010/863/863_ReedCanaryGrass.pdf[accessed 17 Jan 2014]).	1. "S. [Sclerospora] macrospora, which is present in crop and rangeland areas throughout S. Dak., produces abundant sporangia and zoospores on leaves of infected perennial and annual grasses following rain or floods and persists as mycelium in grasses such as Poa pratensis, Bromus inermis, and Phalaris arundinacea, growing in locations from which cereals and annual grasses may become diseased. " (S. macrospora is a corn disease of minor importance). 2. Reed canary grass can be attacked by the larvae of various insect species, the larvae kill the stems by feeding inside their base. This damage can occasionally cause significant yield reductions. Double lobed moths and fritflies have both been associated with stem damage in reed canary grass...Diseases have been reported on reed canary grass although not at levels which might cause concern. Brown rust, mildew, buff spot, powdery mildew and rhynchosporium have all been reported on reed canary grass."
4.07	1. Pollen Library: Canary Grass (Phalaris) (http://www.pollenlibrary.com/Genus/Phalaris/ [accessed 14 Jan 2014]). 2. Weinmann et al. (1984) Wetland plants of the Pacific Northwest. U.S. Army Corps of Engineers, Seattle.	1. "Reed canary grass flowers from June to August and is suspected of causing pollinosis in Minnesota. Phalaris species are considered to be the most serious allergenic pollen source in southern California. " 2. Abundant pollen production linked to hay fever and allergies.

4.08	1. Waggy, Melissa, A. 2010. Phalaris arundinacea. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: (http://www.fs.fed.us/database/feis/ [2014, January 17]) 2. Robertson, Morgan M. 1997. Prescribed burning as a management and restoration tool in wetlands of the upper Midwest, [Online]. In: Restoration and Reclamation Review: Student On-line Journal. 2(4). St. Paul, MN: University of Minnesota, Department of Horticultural Science (Producer). (http://conservancy.umn.edu/bitstream/58825/1/2.4.Robertson.pdf [17 JAN 2014]).	1. "Little has been reported on reed canarygrass' fuel characteristics or its potential to alter fuel characteristics in communities it has invaded. Robertson speculated that reed canarygrass may increase fuel loads where it forms dense stands or monocultures, and these conditions may result in severe fires with high rates of spread. " 2. "Due to higher productivity in wetlands and the density of the most common wetlands dominants (Phragmites, Spartina, Typha and Phalaris spp.), and to the fact that these frequently occur as monocultures, fuel loads are often considerably higher per unit area in wetlands than in uplands. This creates a much hotter burn, and under the right conditions, a faster one. The intensity of the updraft often carries embers farther than an upland burn might, and firebreaks may thus have to be wider."
4.09	1. Perry & Galatowitsch (2004) The influence of light availability on competition between Phalaris arundinacea and a native wetland sedge. Plant Ecol 170:73-81. 2. Kellogg, Bridgham, Leicht (2003) Effects of water level, shade, and time on germination and growth of freshwater marsh plants along a simulated successional gradient. 3. as reviewed in: 1. Waggy, Melissa, A. 2010. Phalaris arundinacea. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: (http://www.fs.fed.us/database/feis/ [2014, January 17])	Phalaris arundinacea is an early successional plant that does very well in ample sunlight. No Evidence of shade tolerance as a dominant characteristic. 1. "Lowering light availability substantially reduced P. arundinacea total biomass, by 52% at 200 µmol m−2 s−1 and by 99% at 10 µmol m−2 s−1. However, shade also reduced C. hystericina total biomass, by 62% at 200 µmol m−2 s−1 and by 99% at 10 µmol m−2 s−1." 2. Seed germination was reduced significantly by shade treatments, 22% in no shade, 10% 40% shade, and 4% in 80% shade. 3. "Shade tolerance: Reed canarygrass prefers full sunlight ([196], reviews by [119,204]) and, while it grows in shade ([66,202], reviews by [119,215]), its abundance may decrease with decreased light. In Washington, reed canarygrass biomass was reduced by 68% within 2 years after willow plantings and subsequent canopy development [149]. Based on reed canarygrass' frequency in floodplains of the Mississippi and Wisconsin rivers, Menges and Waller [203] concluded that reed canarygrass had a preference for well-lit sites. In the greenhouse, reed canarygrass' aboveground biomass was reduced in shade when compared to reed canarygrass grown without shade. In heavy shade (86% shade), reed canarygrass' aboveground biomass was reduced by 97% compared to plants grown without shade [196]. "
4.10	1. USDA Plants database (http://plants.usda.gov/core/profile?symbol=PHAR3 [accessed 13 Jan 2014]). 2. United States Department of Agriculture, Natural Resources Conservation Service. Global Soil Regions Map. September, 2005. (http://soils.usda.gov/use/worldsoils/mapindex/order.html. [Accessed 14Jan 2014]).	1. Distribution across much of North America. 2. Distribution includes soil orders Spodisols, enceptisols, mollisols, etc.
4.11		No Evidence
4.12	1. Apfelbaum and Sams (1987) Ecology and control of reed canarygrass (Phalaris arundinacea L.). Nat. Areas J. 7:69-74. 2. Barnes (1999) The rapid growth of a population of reed canarygrass (Phalaris arundinacea L.) and its impact on some riverbottom herbs. J Torr Bot Soc 126:133-138.	1. Forms dense, highly productive monocultures that spread radially reproducing and spreading from seeds, rhizomes and tillers. 2. Rapid clonal expansion results in dense monospecific stands.
5.01	1. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?310864).	1. Family Poaceae

5.02	1. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?310864).	1. Family Poaceae
5.03	1. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?310864).	1. Family Poaceae
5.04	1. Waggy, Melissa, A. 2010. Phalaris arundinacea. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: (http://www.fs.fed.us/database/feis/ [2014, January 17])	1. Plant life form is listed as geophyte.
6.01		No Evidence
6.02	1. Wisconsin Reed Canary Grass Management Working Group (2009) Reed Canary Grass (Phalaris arundinacea) Management Guide: Recommendations for landowners and restoration professionals. PUB-FR-428.2. Boedeltje et al. (2004) Dispersal phenology of hydrochorous plants in relation to discharge, seed release time and buoyancy of seeds: the flood pulse concept supported. J Ecol 92:786-796.	1. Reed Canarygrass reproduces by seed, stem fragments, and underground horizontal stems. 2. P. arundinacea disperses both vegetatively and from seeds
6.03	1. Reuter (1986) Sedge meadows of the Upper Midwest: a stewardship summary. Nat Area J 6:27-34. 2. Merigliano & Lesica (1998) The native status of reed canary grass (Phalaris arundinacea L.) in the Inland Northwest, USA. Nat Area J. 18:223-230. 3. Nelson et al (2014) Population genetic structure of N. American and European Phalaris arundinacea L. as inferred from inter-simple sequence repeat markers. Bio Inv 16:353-363.	Native and non-native strains of RCG are thought to hybridize. 1.& 2. It is generally thought that invasive populations are comprised of either nonnative strains or hybrids between nonnative and native strains. 3. Genetic analysis of populations from N. America and Europe indicate that current populations are admixtures two formerly distinct genetic groups (The degree of hybridization betwee NA and European genotypes in the invasive NA populations is unknown).
6.04	1. Weimarck (1968) Self incompatibility in the Gramineae. Hereditas 60:157-166.	1. Highly self incompatible.
6.05	1. Weimarck (1968) Self incompatibility in the Gramineae. Hereditas 60:157-166.	no Evidence. 1. Wind pollinated.
6.06	1. Apfelbaum and Sams (1987) Ecology and control of reed canarygrass (Phalaris arundinacea L.). Nat. Areas J. 7:69-74. 2. Cassler and Hovin (1980) Genetics of vegetative stand establishment characters in reed canarygrass clones. Crop Sci 20:511-515. 3. Boedeltje et al. (2004) Dispersal phenology of hydrochorous plants in relation to discharge, seed release time and buoyancy of seeds: the flood pulse concept supported. J Ecol 92:786-796.	1. grows and spreads quickly and is capable of producing dense rhizome growth within one growing season. Rhizome development in the greenhouse 26 days after germination, 16 weeks after germination, plants bloomed and had an average of 48 rhizomes. 2. 74% of new shoots originate from rhizomes and the remainder from auxillary buds in laboratory. 3. P. arundinacea disperses both vegetatively and from seeds.
6.07	1. Kilbride and Paveglio (1999) Integrated pest management to control reed canarygrass in seasonal wetlands of southwestern Washington. Wildlife Society Bulletin 27:292-297. 2. Apfelbaum and Sams (1987) Ecology and control of reed canary grass (Phalaris arundinacea L.). Nat. Areas J. 7:69-74.	1. Large quantities of highly mobile seed produced in first year of life. 2. Seeds germinate immediately after ripening and there are no known dormany requirements
7.01	1. Wisconsin Reed Canary Grass Management Working Group (2009) Reed Canary Grass (Phalaris arundinacea) Management Guide: Recommendations for landowners and restoration professionals. PUB-FR-428.2.	1. Seeds are dispersed by humans and animals as the seed will stick to moist skin, fur, clothing, equiptment/vehicles
7.02	1. reviewed in Lavergne & Molofsky (2004) Reed canary frass (Phalaris arundinacea) as a biological model in the study of plant invasions. Crit Rev Plant Sci 23:415-429.	1. RCG is planted for a variety of purposes including forage crop, persistent or perennial cover crop for pastures, restoration of degraded soils, soil stabalization, bioenergy/biomass plantings.

7.03	1. Corley (1989) Propagation of ornamental grasses adapted to Georgia and the US southeast. Combined Proc Int Plant Propagators Soc 39:332-337.	1. Will produce roots and shoots from the nodes of culms.
7.04		No Evidence
7.05	1. Coops and Van Der Velde (1995) Seed dispersal, germination and seedling growth of 6 helophyte species in relation to water level zonation. Freshwater Bio 34:13-20. 2. Boedeltje et al. (2004) Dispersal phenology of hydrochorous plants in relation to discharge, seed release time and buoyancy of seeds: the flood pulse concept supported. J Ecol 92:786-796. 3. Pullman & Crowder (2001) Biology, history, and supression of reed canarygrass (Phalaris arundinacea L.). Technical Notes, USDA-Natural Resources Conservation, Plant Materials 43, Spokane, WA.	1. Hydrochory is the primary mode of dispersal for helophytes. P. arundinacea appears to be a long floater that arrives at higher elevationswith hydrology that better sustatins vegetation development. 2. P. arundinacea disperses both vegetatively and from seeds doing particularly well, during flooding events resulting in the dispersal of large amounts of vegetative propagules. 3. Bank erosion and transport of culms allows for yet another means of establishing plants along a watercourse.
7.06		No Evidence
7.07	1. Wisconsin Reed Canary Grass Management Working Group (2009) Reed Canary Grass (Phalaris arundinacea) Management Guide: Recommendations for landowners and restoration professionals. PUB-FR-428. 2. Vivian-Smith and Stiles (1994) Dispersal of salt marsh seeds on the feet and feathers of waterfowl. Wetlands. 14:316-319.	1. Seeds are dispersed by humans and animals as the seed will stick to moist skin, fur, clothing, equiptment/vehicles. 2. Animals may provide long-range seed dispersal of reed canarygrass and help deposit seed in sites more favorable to germination than seed randomly dispersed by water.
7.08		No Evidence
8.01	1. Kilbride and Paveglio (1999) Integrated pest management to control reed canarygrass in seasonal wetlands of southwestern Washington. Wildlife Society Bulletin 27:292-297. 2. Coops and Van Der Velde (1995) Seed dispersal, germination and seedling growth of 6 helophyte species in relation to water level zonation. Freshwater Bio 34:13-20.	1. Large quantities of highly mobile seed produced in first year of life. 2. Individual propagule weight was 0.32+0.07 with 393+120 seeds per flowering shoot.
8.02	1. Touzard et al. (2002) The relationships between soil seed bank, aboveground vegetation and disturbances in an eutrophic alluvial wetland of Western France. Flora 197:175-185. 2. Leck (1996) Germination of macrophytes from a Delaware River tidal freshwater wetland. Bull Torr Bot Club. 123:48-67. 3. Grime et al. (1981) A comparative study of germination characteristics in a local flora. J Ecol 69:1017-1059.	1. We found such species that are perennial and almost promote vegetative reproduction compared to the sexual way (e.g. Carex elata, Carex vesicaria, Phalaris arundinacea) and could greatly contribute to decrease this similarity. Such species have been described as the disporum type, i.e., species which show no evidence of forming a seed bank. 2. reed canarygrass seed remains viable in the soil for more than 1 year. 3. In germination tests, percent germination of RCG seed declined with increased age (87% for 3-month-old seed, 77% for 6-month-old seed, and 65% for 1-year-old seed).
8.03	1. Perry and Galatowitsch (2006) Light competition for invasive species control: a model of cover crop weed competition and implications for Phalaris arundinacea control in sedge meadow wetlands. Euphytica 148:121-134. 2. Pasture Picker Phalaris factsheet (http://www.pasturepicker.com.au/Html/Phalaris.htm[accessed 31 Dece 2013]). 3. Apfelbaum and Sams (1987) Ecology and control of reed canarygrass (Phalaris arundinacea L.). Nat. Areas J. 7:69-74. 4. Reinhardt Adams & Galatowitsch 2006) Increasing the effectiveness of reed canary grass (phalaris arundinacea L. control in wet meadow restorations. Rest Ecol 14:441-451.	1. Broad scale application of herbicides can control RCG, but RCG is commonly found in wetland habitats in which spraying becomes more difficult and persistent rhizomes are not controlled. 2. Sensitive to glyphosate and grass-specific herbicides but large plants may require higher rates to be killed. 3. Complete tissue necrosis occurred 3 weeks after canary grass leaves and roots were exposed to 300 ppm of boron. Dalapon, Amitrol, and Glyphosate also proved effective. Canary grass responds quickly by growing back from rhizhomes and seeds from the seedbank. 4. Glyphosate application in late August and late September more effective than mid-may due to translocation of glyphosate to rhizomes (two May applications reduced biomass as much as one late season application).

8.04	1. Kercher and Zedler (2004) Multiple disturbances accelerate invasion of reed canary grass (Phalaris arundinacea L.) in a mesocosm study. Oecologia 138:455-464.	1. In a mesocosm experiment, P. arundinacea that had been "grazed (simulated herbivory) had significantly greater biomass than those that were not grazed. The combination of nutrient addition and grazing increased biomass approximately 200%. Grazed mesocosms initially had significantly lower frequency of P. arundinacea, but with time this trend reversed and grazed mesocosms had 7.9 intervals vs. 5.2 intervals in ungrazed.
8.05	1. Cheeke (1995) Endogenous toxins and mycotoxins in forage grasses and their effects on livestock. J Anim Sci 73:909-918.	No Evidence. Produces significant amounts of alkaloids reducing palatability to herbivores.