Oregon Department of Agriculture
Plant Pest Risk Assessment for
Giant Hogweed, *Heracleum mantegazzianum*
2009 (Revised 2013)

Name: Giant Hogweed, *Heracleum mantegazzianum* a.k.a. hogweed, giant cow-parsley
Family: Carrot or parsley, *Apiaceae (Umbelliferae)*

Findings of this Review and Assessment: *Heracleum mantegazzianum* has been determined to be a category of **"A"** listed noxious weed as defined by the Oregon Department of Agriculture (ODA) Noxious Weed Policy and Classification System. This determination is based on a literature review and analysis using two ODA evaluation forms. Using the Noxious Qualitative Weed Risk Assessment v.3.8, giant hogweed scored **64** indicating an **A,** and a score of **16** with the Noxious Weed Rating System v.3.2. The introduction and spread of giant hogweed in Oregon presents major challenges to both humans and environment. Early detection of new outbreaks is critical to control this species.

Photo by Shannon Brubaker, ODA

Photo by Glenn Miller, ODA

Introduction: Giant hogweed, *Heracleum mantegazzianum* is a USDA federally listed noxious weed and is listed as noxious by twelve states. A member of the carrot family, giant hogweed is native to the Caucasus Mountains, a region of Asia between the Black and Caspian seas. Early in the twentieth century it was introduced and planted as an ornamental in arboretums and private gardens throughout Europe and North America. It soon escaped and established in surrounding areas. It is considered the most widespread and invasive weed in many parts of Europe including England, Scotland, Scandinavia and Germany. In North America it grows in Ontario, Quebec, New York, Michigan, Maine, Pennsylvania, Washington and now, Oregon.

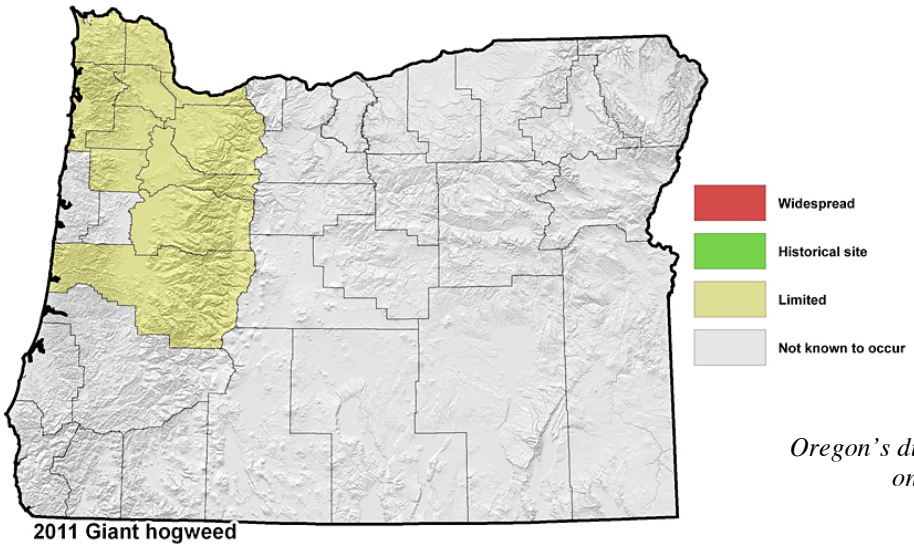
The plant is especially troublesome in riparian areas and urban sites where it has escaped from plantings. It is a nuisance in parks and natural areas often growing at high densities, prompting active control projects in most of Europe and North America where it is invasive. Giant hogweed is considered a public health hazard and causes a phototoxic reaction when skin is exposed to sap and UV-rays. Plants contain a clear watery sap that sensitizes the skin to ultraviolet radiation and affected areas often develop severe sunburns and dermatitis. In severe cases the irritation leads to blistering that result in painful dark purple scars. The scars resemble birthmarks and can last for several years.

The plant's large size and striking appearance attracts the interest of gardeners who regard the plant as a novelty. Federal and state weed listings regard the species as noxious thereby restricting transport, propagation and sale, though seeds are occasionally traded by garden clubs or sold by collectors of unusual plants. Some illegal import may occasionally occur. The seed of giant hogweed is used to flavor certain Middle Eastern dishes. One of the top import violations by passengers traveling from the Middle East is the illegal transport of whole or ground seeds as reported by the Portland office of USDA-APHIS PPQ.

Growth Habits, Reproduction, and Spread: Giant hogweed is a large herbaceous perennial that flowers spring to early summer (May-June). It produces large white multi-flowered stems called umbels that measure 12 to18 inches across. It has a stout tuberous perennial rootstalk that forms buds that grow annually to mature stalks. Giant hogweed can reach a height of 15 feet. Stems are often purple but can vary from entirely purple to mostly green with purple blotches. The surface of the stem is rough with raised blisters and has individual hairs emerging from each bump. This is a key characteristic for identification. Stems are hollow and are two to four inches in diameter. Leaf size, which can be two to four feet in length, can also help distinguish it from look-a-like plants. Cow parsnip, a native species, has a similar appearance but is smaller in size and the stems are ridged and do not have rough raised blisters or bumps. After seed shatter, hogweed plants remain standing but turn brown and die back to the ground by fall. Plants live for several years and reemerge the following spring from the rootstalk.

This plant spreads solely by seeds. Papery disc-shaped seeds disperse near mature plants expanding existing infestations. The seeds are well suited to dispersal by water and float down stream or are blown by wind across waters and lodge on banks to start new infestations. Gardeners that are unaware of its toxic and invasive qualities planted the majority of sites in Oregon.

Native Range: Giant hogweed is native to The Caucasus Region and Central Asia.

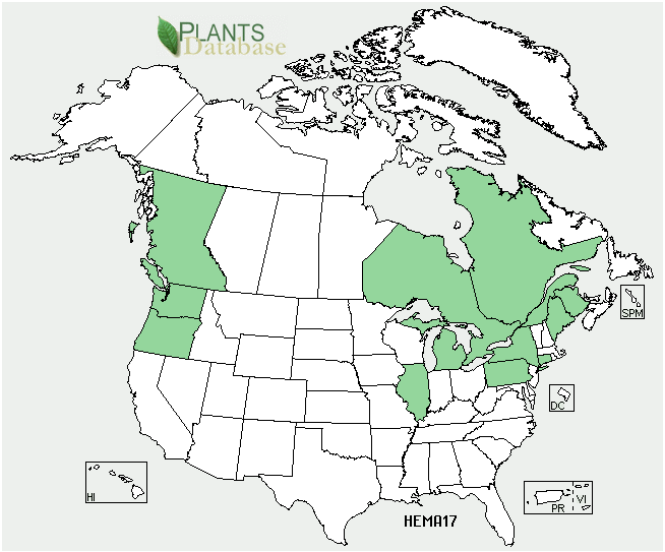


Oregon's distribution of giant hogweed on Weedmapper.org

Distribution in North America: Giant hogweed has been introduced to Canada and the United States. In the east it if found in Ontario, Quebec, New York, Michigan, Maine, and Pennsylvania. In the west it occurs in British Columbia, Washington and Oregon.

The first Oregon giant hogweed sites were found in Lane County in March of 2001. A small infestation was detected in Oakridge and a second site was reported in Eugene. With media attention and an aggressive outreach program, 38 additional sites were reported in the Willamette Valley. Fifty-one sites are reported as of 2009; infestations occur in Lane, Linn, Marion, Clackamas, Multnomah, Polk, Yamhill, Washington, Columbia, Clatsop and Tillamook Counties.

The majority of sites are urban in backyards, roadsides and waste areas. The most heavily infested watershed is the Tualatin in Washington County where plants are found on five miles of Fanno and Vermont Creeks. Riparian infestations have been limited to the Tualatin watershed and the headwaters of Crystal Springs Creek near Reed College in Portland. The reporting of new infestations peaked in 2003. Net affected acres have declined from 20 to less then .25 during this period. Few new sites are reported annually and all known infestations are under treatment or controlled.



US distribution of giant hogweed on USDA Plants Database

Habitat Availability: Significant acres of riparian and forested habitat are susceptible for invasion. Moist wooded areas provide optimal reproductive conditions with ample winter moisture for germination.

Reproductive Potential After Establishment: Giant hogweed is resistant to herbivory in North America. With abundant rainfall in the Pacific Northwest, it can reach its full reproductive potential.

Probability of Early Detection: Hogweed is very showy and easily identified. A successful public education campaign has resulted in 80+ detections mainly by the general public. The number of new detections is very limited in 2012.

Potential for Human Caused Dispersal: The plant is not available through the North American garden seed trade. Occasional seed sharing and importation by foreign nationals is rare and often intercepted at ports.

Hardiness Zones: The species can survive well in multiple hardiness zones where adequate seasonal moisture is available. See Attachment A.

Positive Economic Impact: There are few economic benefits associated with giant hogweed. It has some limited use as an ornamental, but is not grown or sold commercially in Oregon. It is on the Federal noxious weed list and several states' noxious and prohibited lists making it unlawful to transport, propagate and sale. The primary economic value is from the sale of seeds. The seed of *Heracleum* species including giant hogweed are used to make golpar, a Persian spice. The spice is used in Middle east cooking and imparts a distinctive aromatic smell and flavor. The seeds are ground and used as powder. It often is labeled erroneously and sold as "Angelica Seeds." The spice is sprinkled over beans, lentils and potatoes and used to spice soups and stew. It is also a common spice of dressings mixed with vinegar and used for dipping.

Negative Economic Impact: Giant Hogweed is a health hazard. People often develop severe burns resulting in blistering and painful dermatitis that requires medical attention. The plant is invasive in natural areas and a public nuisance prompting the need for control programs. Heavy stands can impede access to riverbanks and the use of recreation areas. Active control programs occur in the west in Oregon, Washington and British Columbia.

Photo by USDA APHIS PPQ Archive, Bugwood.org

Ecological Impacts: Giant hogweed colonizes a wide variety of habitats but is most common along roadsides, vacant lots, streams, and private gardens. The most significant impacts occur in riparian areas where hogweed thrives under optimal conditions, readily growing and invading the banks of streams, rivers, lakes, and ponds. Heavy infestations compete with and displace native species. Giant hogweed also provides poor winter groundcover leading to increased erosion during high water events.

Control: Giant hogweed can be controlled with broadleaf herbicides and by digging. Cutting and mowing alone are ineffective due to the large rootstalk. These activities are also a health concern due to the potential for human exposure to the toxic sap. The plant is susceptible to several herbicides and is easily controlled through timely application. The seeds have a moderate lifespan (5-10 years) and with several years of persistent treatments, populations can be eliminated. The most troubling aspect associated with control projects are locating, accessing and applying treatments in riparian zones, remote places and private properties where access is restricted.

Noxious Weed Qualitative Risk Assessment
Oregon Department of Agriculture

Common name: Giant hogweed
Scientific name: *Heracleum mantegazzianum*
Family: Carrot or parsley**,** *Apiaceae (Umbelliferae)*

For use with plant species that occur or may occur in Oregon to determine their potential to become serious noxious weeds. For each of the following categories, select the number that best applies. Numerical values are weighted to increase priority categories over less important ones. Choose the best number that applies, intermediate scores can be used.

Total Score: 64 **Risk Category: A**

GEOGRAPHICAL INFORMATION

1) 6 **Invasive in Other Areas**

0 Low- not know to be invasive elsewhere.
2 Known to be invasive in climates dissimilar to Oregon's current climates.
6 Known to be invasive in geographically similar areas.

Comments: Known to be invasive in geographically similar areas.

2) 6 **Habitat Availability:** Are there susceptible habitats for this species and how common or widespread are they in Oregon?

1 *Low* – Habitat is very limited, usually restricted to a small watershed or part of a watershed (e.g., tree fern in southern Curry County).
3 *Medium* – Habitat encompasses 1/4 or less of Oregon (e.g., oak woodlands, coastal dunes, eastern Oregon wetlands, Columbia Gorge).
6 *High* – Habitat covers large regions or multiple counties, or is limited to a few locations of high economic or ecological value (e.g., threatened and endangered species habitat).

Comments: Susceptible habitat is large. Hogweed can invade habitats currently occupied by its native relative cow parsnip. Plant is adaptable to many site types including riparian, roadsides, forests ditch banks and meadows.

3) 0 **Proximity to Oregon**: What is the current distribution of the species?

0 *Present* – Occurs within Oregon.
1 *Distant* – Occurs only in distant US regions or foreign countries.
3 *Regional* – Occurs in Western regions of US but not adjacent to Oregon border.
6 *Adjacent* – Weedy populations occur adjacent (<50 miles) to Oregon border.

Comments: Occurs in 11 northwestern counties in Oregon.

4) 8 **Current Distribution**: What is the current distribution of escaped populations in Oregon?

0 *Not present* – Not known to occur in Oregon.
1 *Widespread* – Throughout much of Oregon (e.g., cheatgrass).

5 *Regional* – Abundant (i.e., occurs in eastern, western, central, coastal, areas of Oregon) (e.g., gorse, tansy ragwort).
10 *Limited* – Limited to one or a few infestations in state (e.g., kudzu).

Comments: Weedy populations are found in Washington State and occur in eleven western Oregon counties though infestations are rare. Plants can be controlled and Oregon populations are declining making eradication reasonable.

BIOLOGICAL INFORMATION

5) 4 **Environmental Factors**: Do abiotic (non-living) factors in the environment effect establishment and spread of the species? (e.g., precipitation, drought, temperature, nutrient availability, soil type, slope, aspect, soil moisture, standing or moving water).

1 *Low* – Severely confined by abiotic factors.
2 *Medium* – Moderately confined by environmental factors
4 *High* – Highly adapted to a variety of environmental conditions (e.g., tansy ragwort, Scotch broom).

Comments: Plant has potential to out-compete native flora in critical habitat. It grows, reproduces and disperses most prolifically in riparian zones. Once established seeds disperse and occupy disturbed sites and colonize the watershed. Can limit recreation and access where established.

6) 5 **Reproductive Traits:** How does this species reproduce? Traits that may allow rapid population increase both on and off site.

0 *Negligible* – Not self-fertile, or is dioecious and opposite sex not present.
1 *Low* – Reproduction is only by seed, produces few seeds, or seed viability and longevity are low.
3 *Medium* – Reproduction is vegetative (e.g., by root fragments, rhizomes, bulbs, stolons).
3 *Medium* – Produces many seeds, and/or seeds of short longevity (< 5 years).
5 *High* – Produces many seeds and/or seeds of moderate longevity (5-10 years) (e.g., tansy ragwort).
6 *Very high* – Has two or more reproductive traits (e.g., seeds are long-lived >10 years and spreads by rhizomes).

Comments: The Pacific Northwest climate provides ideal growing conditions for reproduction and spread. The plant is not limited by environmental factors and thrives in both riparian and dryer upland sites.

7) 4 **Biological Factors:** Do biotic (living) factors restrict or aid establishment and spread of the species? (What is the interaction of plant competition, natural enemies, native herbivores, pollinators, and pathogens with species?)

0 *Negligible* – Host plant not present for parasitic species.
1 *Low* – Biotic factors highly suppress reproduction or heavily damage plant for an extended period (e.g., biocontrol agent on tansy ragwort).
2 *Medium* – Biotic factors partially restrict or moderately impact growth and reproduction, impacts sporadic or short-lived.
4 *High* – Few biotic interactions restrict growth and reproduction. Species expresses full growth and reproductive potential.

Comments: No approved biocontrol agent available. Plant expresses full growth and reproductive potential.

8) 5 Reproductive Potential and Spread After Establishment - Non-human Factors: How well can the species spread by natural means?

0 *Negligible* – No potential for natural spread in Oregon (e.g., ornamental plants outside of climate zone).

1 *Low* – Low potential for local spread within a year, has moderate reproductive potential or some mobility of propagules (e.g., propagules transported locally by animals, water movement in lakes or ponds, not wind blown).

3 *Medium* - Moderate potential for natural spread with either high reproductive potential or highly mobile propagules (e.g., propagules spread by moving water, or dispersed over longer distances by animals) (e.g., perennial pepperweed).

5 *High* – Potential for rapid natural spread throughout the susceptible range, high reproductive capacity and highly mobile propagules. Seeds are wind dispersed over large areas (e.g., rush skeletonweed).

Comments: Species has become weedy and problematic in many regions of North American and Europe demonstrating the ability to inhabit many climatic zones. It is hardy and tolerant of cold and thrives in temperate regions. It is well suited to the Pacific Northwest and grows in USDA Zone 1 and above.

9) 4 Potential of Species to be Spread by Humans. What human activities contribute to spread of species? Examples include: interstate or international commerce; contaminated commodities; packing materials or products; vehicles, boats, or equipment movement; logging or farming; road maintenance; intentional introductions of ornamental and horticultural species, or biofuel production.

1 *Low* – Potential for introduction or movement minimal (e.g., species not traded or sold, or species not found in agricultural commodities, gravel or other commercial products).

3 *Medium* – Potential for introduction or off-site movement moderate (e.g., not widely propagated, not highly popular, with limited market potential; may be a localized contaminant of gravel, landscape products, or other commercial products) (e.g., lesser celandine, Canada thistle).

5 *High* – Potential to be introduced or moved within state high (e.g., species widely propagated and sold; propagules common contaminant of agricultural commodities or commercial products; high potential for movement by contaminated vehicles and equipment, or by recreational activities) (e.g., butterfly bush, spotted knapweed, Eurasian watermilfoil).

Comments: Seed is not windblown and would require human activities for long-distance transport. Plants and seeds are traded and sold to a limited extent for ornamental use and illegal imports occur for use as spice. The dumping of yard debris can contribute to the spread. Seeds moved by water during flood events.

IMPACT INFORMATION

10) 5 Economic Impact: What impact does/can the species have on Oregon's agriculture and economy?

0 *Negligible* – Causes few, if any, economic impacts.

1 *Low* - Potential to, or causes low economic impact to agriculture; may impact urban areas (e.g., puncture vine, pokeweed).

5 *Medium* – Potential to, or causes moderate impacts to urban areas, right-of-way maintenance, property values, recreational activities, reduces rangeland productivity (e.g., English ivy, Himalayan blackberry, cheatgrass).

10 *High* – Potential to, or causes high impacts in agricultural, livestock, fisheries, or timber production by reducing yield, commodity value, or increasing production costs (e.g., gorse, rush skeleton weed, leafy spurge).

Comments: Can cause moderate economic impacts related to its potential impact to recreational activities, human health impacts and the need for active control programs to control or contain.

11) 6 **Environmental Impact**: What risks or harm to the environment does this species pose? Plant may cause negative impacts on ecosystem function, structure, and biodiversity of plant or fish and wildlife habitat; may put desired species at risk.

0 *Negligible* – None of the above impacts probable.
1 *Low* – Can or does cause few or minor environmental impacts, or impacts occur in degraded or highly disturbed habitats.
4 *Medium* – Species can or does cause moderate impacts in less critical habitats (e.g., urban areas, sagebrush/ juniper stands).
6 *High* – Species can or does cause significant impacts in several of the above categories. Plant causes severe impacts to limited or priority habitats (e.g., aquatic, riparian zones, salt marsh; or T&E species sites).

Comments: Demonstrates a potential to escape garden cultivation and establish wild populations that displace native flora in quality riparian or forest habitats.

12) 4 **Impact on Health:** What is the impact of this species on human, animal, and livestock health? (e.g., poisonous if ingested, contact dermatitis, acute and chronic toxicity to livestock, toxic sap, injurious spines or prickles, causes allergy symptoms.

0 *Negligible* – Has no impact on human or animal health.
2 *Low* – May cause minor health problems of short duration, minor allergy symptoms (e.g., leafy spurge).
4 *Medium* – May cause severe allergy problems, death or severe health problems through chronic toxicity, spines or toxic sap may cause significant injury. (e.g., giant hogweed, tansy ragwort).
6 *High* – Causes death from ingestion of small amounts, acute toxicity (e.g. poison hemlock).

Comments: Plant causes severe rashes and blistering to human skin. Children are very susceptible.

CONTROL INFORMATION

13) 5 **Probability of Detection at Point of Introduction**: How likely is detection of species after introduction and naturalization in Oregon?

1 *Low* – Grows where probability of early detection is high, showy and easily recognized by public; access to habitat not restricted (e.g., giant hogweed).
5 *Medium* – Easily identified by weed professionals, ranchers, botanists; some survey and detection infrastructure in place. General public may not recognize or report species (e.g., leafy spurge).
10 *High* – Probability of initial detection by weed professionals low. Plant shape and form obscure, not showy for much of growing season, introduction probable at remote locations with limited access (e.g., weedy grasses, hawkweeds, skeletonweed).

Comments: Weed is large and showy and easily detected, but is often confused with the native cow parsnip. Early detection surveys common in Western Oregon. Plant can grow in areas that are difficult to access and survey such as private backyards and overgrown riparian zones.

14) 2 **Control Efficacy:** What level of control of this species can be expected with proper timing, herbicides, equipment, and biological control agents?

1 *Negligible* – Easily controlled by common non-chemical control measures (e.g., mowing, tillage, pulling, and cutting; biocontrol is very effective at reducing seed production and plant density) (e.g., tansy ragwort).

2 *Low* – Somewhat difficult to control, generally requires herbicide treatment (e.g., mechanical control measures effective at preventing flowering and but not reducing plant density; herbicide applications provide a high rate of control in a single application; biocontrol provides partial control).

4 *Medium* – Treatment options marginally effective or costly. Tillage and mowing increase plant density (e.g., causes tillering, rapid regrowth, spread from root fragments). Chemical control is marginally effective. Crop damage occurs or significant non-target impacts result from maximum control rates. Biocontrol agents ineffective.

6 *High* – No effective treatments known or control costs very expensive. Species may occur in large water bodies or river systems where containment and complete control are not achievable. Political or legal issues may prevent effective control.

Comments: Plant is hard to access when growing in wastelands and riverbanks due to blackberry thickets and other weed species. Residential access requires landowner's permission. Plants susceptible to many herbicides and manual control.

Category Scores:

20 Geographic score (Add scores 1-4) **22** Biological Score (Add lines 5-9)

15 Impact Score (Add lines 10-12) 0**7** Control Score (Add Lines 13-14)

<u>64</u> Total Score (Add scores 1-14 and list on front of form)

Risk Category: 55-90 = **A** 24-54 = **B** < 24 = unlisted.

This Risk Assessment was modified by ODA from the USDA-APHIS Risk Assessment for the introduction of new plant species.
1/15/2013 v.3.8

Oregon Department of Agriculture
Noxious Weed Rating System

Common Name: Giant hogweed
Scientific Name: *Heracleum mantegazzianum*

Point Total: 16 **Rating: A**

1) 3 **Detrimental Effects:** Circle all that apply, enter number of circles.
1. *Health*: causes poisoning or injury to humans or animals
2. *Competition:* strongly competitive with crops, forage, or native flora
3. *Host*: host of pathogens and/or pests of crops or forage
4. *Contamination*: causes economic loss as a contaminate in seeds and/or feeds
5. *Interference*: interferes with recreation, transportation, harvest, land value, or wildlife and livestock movement

2) 4 **Reproduction & Capacity for Spread:** Circle the number that best describes, enter that number.
1. Few seeds, not wind blown, spreads slowly
2. Many seeds, slow spread
3. Many seeds, spreads quickly by vehicles or animals
4. Windblown seed, or spreading rhizomes, or water borne
5. Many wind-blown seeds, high seed longevity, spreading rhizomes, perennials

3) 3 **Difficulty to Control:** Circle the number that best describes, enter that number.
1. Easily controlled with tillage or by competitive plants
2. Requires moderate control, tillage, competition or herbicides
3. Herbicides generally required, or intensive management practices
4. Intensive management generally gives marginal control
5. No management works well, spreading out of control

4) 3 **Distribution:** Circle the number that best describes, enter that number.
1. Widely distributed throughout the state in susceptible habitat
2. Regionally abundant, 5 or more counties, more than 1/2 of a county
3. Abundant throughout 1- 4 counties, or 1/4 of a county, or several watersheds
4. Contained in only 1 watershed, or less than 5 square miles gross infestation
5. Isolated infestation less than 640 acres, more than 10 acres
6. Occurs in less than 10 acres, or not present, but imminent from adjacent state

5) 3 **Ecological Impact:** Circle the number that best describes, enter that number.
1. Occurs in most disturbed habitats with little competition
2. Occurs in disturbed habitats with competition
3. Invades undisturbed habitats and crowds out native species
4. Invades restricted habitats (i.e. riparian) and crowds out native species

16 TOTAL POINTS

Note: Noxious weeds are non-native plants with scores of 11 points or higher. Any plants in 4.1, 4.2, and 4.3 should not be classified as "A" rated weeds. *Ratings:* 16 + = A, 15 – 11= B
ODA Weed Rating System 8/30/2012 v.3.2

RA produced by Thomas Forney, ODA with contributing text by Glenn Miller and Beth Myers-Shenai, ODA
RA revised by Glenn Miller, ODA, 2013

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Attachment A