

APPENDIX A. Restoration Action Plan for the Greenbelt Land Trust's Owens Farm

The following table outlines restoration and management activities to accomplish the Goals and Objectives of the Owens Farm Restoration and Management Plan. It is anticipated that these activities will take place in at least 2 phases. As presented here, Phase 1 is expected to take place in the next 5 to 10 years, and Phase 2 between 10 and 20 years from present. Actual timing of restoration activities may vary depending on available resources and changing priorities.

| Goal 1: Protect and restore native biodiversity | | | |
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| Objective A: Protect and restore rare and declining native habitats and associated native species, and the processes which maintain them. | | | |
| Actions | Phase | Polygons | Details |
| 1. Collect and/or purchase native prairie seed or plant materials for use in restoration plantings. | 1 | n/a | Collect seed from onsite or obtain from the appropriate genetic neighborhood for use on the site. Use seed sources that maximize genetic diversity but do not compromise genetic integrity of known ecotypes, and that comply with current accepted genetic standards for establishing seed transfer zones. |
| 2. Control encroaching woody vegetation in known rare plant habitat areas and in prairie at imminent risk. | 1 | E, F, G, I, O | Use machine or manual cutting, mowing, prescribed burning, herbicides, and other methods as appropriate to control encroaching woody vegetation. If possible, remove slash and woody debris from site, or broadcast burn it, or pile it away from rare plant populations and native habitats. |
| 3. Expand and restore upland/wetland prairie mosaic north of Jackson Creek and west of the highway. | 1 | E, F, G | Clear woody vegetation along the southern margins of the existing prairie, leaving a 25 foot wooded buffer along the north side of Jackson Creek. Replant with native prairie species. Treat invasives and resprouting woody species with spot herbicide treatments. Flag and protect all significant populations of natives before treatment. |
| 4. Implement a prescribed burning program to maintain all open areas | 1 | D, F, G, I, J, M, N, O, Q; and any areas restored to | If possible, implement prescribed burning on a rotational basis, burning no more than half of any management unit in a single year. Due to smoke management concerns burning may have to be limited |



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| free of woody encroachment. | | prairie/savanna in the future | to small plots, and/or be accomplished by alternative technologies such as infrared machine burners or propane burners that produce less smoke. Prioritize burning in highest quality prairie habitats and areas with rare plant populations. Increase the burn interval in prairie areas by cutting and baling excess plant material to reduce thatch buildup. Remove from site and use for compost if possible |
| 5. Thin ash forest overstory and clear understory to benefit Nelson's checkermallow. | 1 | E (eastern 2/3) | Thin overstory to woodland density (30-70% cover) by opening up gaps, especially in Nelson's checkermallow population areas. Clear or thin native understory shrubs and invasive exotic plant species. Minimize soil disturbance by using low ground pressure equipment to remove trees and shrubs or hand cut and immediately treat cut stems with herbicide. Monitor and control weeds such as reed canarygrass and Armenian blackberry that may invade following treatment. |
| 6. Thin oak forest overstory to savanna density. | 1 | A (east part) | Thin overstory to 5-30% cover and clear understory of native woody vegetation and invasive exotic plant species. Restore native prairie herb layer. |
| 7. Thin oak forest and maple forest overstory to woodland. | 1 | A (west part), S | Thin overstory to 30-70% cover and clear or thin understory of native woody vegetation and invasive exotic plant species, leaving patches of native shrubs and restoring native understory herbs. Thin to varying densities, leaving patches of trees, with numerous gaps. Treat hardwood stumps with herbicide to prevent resprouting. |
| 8. Remove slash and woody debris from the site, or dispose of onsite in a way that minimizes negative impacts | 1 | A, B, C, E, F, G, H, M, N, O, P | If possible, remove slash and woody debris from site. If this is not feasible options for disposal include broadcast burning, piling and burning, chipping for use as mulch on trails and for weed control. Some cut woody debris may be placed in piles to form habitat for small mammals, birds, amphibians and reptiles. |
| 9. Continue restoration efforts in wet prairie areas west of the highway. | 1 | I, J | Continue control efforts of exotics (particularly annual rye) to deplete the seed bank of these species. Continue efforts to increase native diversity and cover with native prairie grasses and forbs using no-till seed drilling or by planting plugs. |



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| 10. Restore prairie/savanna in degraded prairie areas east of the highway. | 1 | N, O | Control invasive exotics and encroaching woody vegetation and replant with native species. Prioritize Nelson's checkermallow population area in Polygon O and the western portion of Polygon N where native prairie species are more common. |
| 11. Restore prairie/savanna in abandoned and currently used agricultural fields. | 1 | D, K, L, Q, R | Kill non-native grasses with herbicide and restore with planting no-till drill or plugs of native grasses and forbs. Do follow-up control of exotics and encroaching woody species. |
| 12. Thin oak woodland and maple woodland to savanna. | 2 | A, S | Thin overstory to to 5-30% overstory cover and restore herb layer with native prairie species. |
| 13. Reintroduce rare species to restored prairie, savanna and other habitat areas. | 2 | A, B, C, D, F, G, I, J, K, L, N, O, Q, R | Reintroduce appropriate rare species including Kincaid's lupine, Bradshaw's lomatium, Willamette Valley daisy, Fender's blue butterfly and others, and expand existing Nelson's checkermallow populations on the site. |
| 14. Explore potential for reintroduction of Northwestern pond turtle. | 2 | I, J, K, L | Determine feasibility of restoration/creation of Northwestern pond turtle nesting habitat by creating low mounds with southerly exposure suitable for nesting. Reintroduce turtles to site if appropriate habitat can be created. Control Eastern bullfrogs. If nesting is established on site, explore installation of predator exclosures, coordinating with ODFW. |
| 15. Explore stream restoration feasibility. | 2 | E, H, P | Explore options for restoring downcut areas of Jackson and Frazier creeks through recontouring to restore floodplain connections and processes. |
| Objective B: Reduce existing impacts and prevent or minimize future impacts of invasive, exotic plants and animals, and encroaching, native woody plants as part of ongoing management of the site. | | | |
| Actions | Phase | Polygons | Details |
| 1. Continue control of encroaching woody vegetation and invasive | 1 | A, C, D, E, F, G, H (margin), M (margin) | Continue followup mowing and spot herbicide treatments. Use hand pulling on small infestations of invasives. If possible, implement prescribed burning program. |



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| exotic plants in areas where control activities have been started. | | | |
| 2. Control invasive exotic plants throughout the project area, concentrating on the riparian corridor. | 1 | E, H, P, Q and entire site | Utilize Integrated Pest Management (IPM) methods to control or eradicate infestations of high and moderate impact invasive, exotic plants such as reed canarygrass, Armenian blackberry, false-brome, English hawthorn and sweet cherry. |
| 3. Prevent new infestations of exotic plants. | 1 | All polygons | Institute guidelines for preventing and minimizing establishment of new infestations including cleaning equipment before entering the site or moving from an infested area to another part of the site. Educate visitors about how they can help prevent weed infestations with informational signs about weeds at trailheads. |
| 4. Control new infestations quickly before they grow. | 1 | All polygons | Institute periodic weed surveys to detect new weed populations and eradicate them before they become too large to easily control. Develop a volunteer group to help monitor the site for invasive species. |
| 5. Identify and control exotic animal species as necessary. | 1 | All polygons | Survey for and consult with ODFW on control methods for Eastern bullfrogs, exotic fish, European starlings, wild turkeys, and other introduced species which may be present and detrimental to native plants and wildlife. Implement control methods as appropriate. |
| Objective C: Continue inventories and assessments to fill knowledge gaps. | | | |
| Actions | Phase | Polygons | Details |
| 1. Inventory species groups for which surveys have not been conducted. | 1 | All | Seek volunteers and grant funding for additional baseline surveys for small mammals, amphibians, reptiles, fish, invertebrates (butterflies, moths, dragonflies, damselflies, etc), fungi, bryophytes, etc. |
| 2. Assess feasibility of reintroduction of rare species. | 1 | n/a | Work with experts to determine appropriate species and habitats for rare species reintroduction. |
| 3. Assess feasibility of | 2 | E, H, P | Explore feasibility of stream restoration through recontouring |



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| stream restoration. | | | downcut areas. |
| Objective D: Combine wildland-urban interface fire protection treatment with habitat restoration objectives. | | | |
| Actions | Phase | Polygons | Details |
| 1. Coordinate fire protection treatments with habitat restoration activities. | 1 | All | Maintain a perimeter fire break, and work with local fire departments and Oregon Department of Forestry to minimize wildland fire danger on the site. In general, conversion of forest thickets to prairie, savanna and woodland will lower fuel loads and may reduce fire danger. |
| Objective E: Develop and utilize Best Management Practices to minimize negative impacts promote more effective achievement of goals. | | | |
| Actions | Phase | Polygons | Details |
| 1. Develop and use Best Management Practices. | 1 | All | Develop and use Best Management Practices to minimize negative impacts of restoration and management activities. (Appendix 6). |

| Goal 2: Incorporate environmental and cultural education and passive recreation opportunities which are compatible with ecological restoration. | | | |
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| Objective A: Protect indigenous and EuroAmerican cultural resources if present, and provide information on traditional ecological knowledge of the local native people, and post-settlement land management activities. | | | |
| Actions | Phase | Polygons | Details |
| 1. Collaborate with Willamette Valley Native Americans to develop educational programs about pre-settlement land management activities. | 2 | n/a | Provide educational opportunities for people to learn about local Native Americans' land management activities and use of local resources, for example, managing habitats for camas and other native prairie plants which were important food sources. |
| 2. Coordinate with City on educational programs | 2 | n/a | Information can be developed and presented about effects of farming and other post-settlement activities on the landscape of |



| Goal 2: Incorporate environmental and cultural education and passive recreation opportunities which are compatible with ecological restoration. | | | |
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| about post-settlement land management activities. | | | Owens Farm and the Willamette Valley and coordinated with activities and facilities that the City develops on the City-owned portion of Owens Farm. |
| Objective B: Provide interpretive signs and self-guided tour. | | | |
| Actions | Phase | Polygons | Details |
| 1. Educate visitors about ecological and cultural values of the site. | 2 | n/a | Explain and interpret ecological context and processes, habitat restoration and management activities, and cultural values of the site. Provide education to make visitors aware of the fragile nature of site resources and minimize negative visitor impacts such as trampling, wildlife disturbance from noise and pets, weed seed transport, etc. |
| Objective C: Provide group access opportunities for low-impact, outdoor environmental and cultural resources education. | | | |
| Actions | Phase | Polygons | Details |
| 1. Coordinate with local schools and organizations to develop educational programs. | 2 | n/a | Develop an educational program with schools, community and environmental education organizations. |
| 2. Educate group leaders. | 2 | n/a | Provide information to teachers and group leaders to facilitate knowledge transfer and minimize site impacts. |
| 3. Minimize impacts. | 2 | n/a | Establish group size limits and activity restrictions. |
| Objective D: Combine education functions with inventory, restoration and monitoring activities where possible. | | | |
| Actions | Phase | Polygons | Details |
| 1. Work with schools and volunteers to accomplish restoration goals | 1, 2 | n/a | Create opportunities to match inventory, restoration and monitoring activities with school classes and volunteer groups to accomplish these functions while providing an educational experience. |
| Objective E: Provide trails through a wide variety of habitats where impacts can be avoided to rare or fragile habitat elements or species. | | | |



Goal 2: Incorporate environmental and cultural education and passive recreation opportunities which are compatible with ecological restoration.

| Actions | Phase | Polygons | Details |
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| 1. Develop a site access and trail plan. | 1 | To be determined | Coordinate with City of Corvallis to determine and develop access points to the site. Plan trail locations, purposes, and construction specifications. Trails will avoid sensitive habitats and rare species populations, nesting sites, etc., while providing a meaningful outdoor recreational and educational experience. Boardwalks will be used if trails are to be constructed in wetland areas. Trails for the disabled will require special design specifications. |
| 2. Design multi-use trails. | 1 | To be determined | Provide trails that will accommodate restoration, maintenance and fire vehicles. |

Objective F: Provide for research opportunities compatible with other goals, and including monitoring where possible.

| Actions | Phase | Polygons | Details |
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| 1. Establish and maintain a list of inventory, research and monitoring needs. | 1 | all | List could include research on restoration methods, control of invasive exotics and woody vegetation, reintroduction of rare species. |
| 2. Coordinate with regional research organizations. | 1 | n/a | Work with Oregon State University, Institute for Applied Ecology, and state and federal natural resource agencies in research on restoration of Willamette Valley habitats, reintroduction and recovery of rare species, control of invasive exotic species, etc. |

Goal 3: Form partnerships with landowners and agencies to promote restoration and management of the site and health of habitats within the watershed.

Objective A: Work with neighboring and nearby property owners to comment and participate in site planning.

| Actions | Phase | Polygons | Details |
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| 1. Involve property owners in site planning. | 1 | n/a | Inform and coordinate with nearby property owners on restoration activities on the GLT's Owens Farm site. Arrange for site access from neighboring lands where necessary (north of Jackson Creek). |



| Goal 3: Form partnerships with landowners and agencies to promote restoration and management of the site and health of habitats within the watershed. | | | |
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| | | | Use publicity and involvement in restoration activities as an opportunity to raise awareness of habitat values on surrounding lands. |
| Objective B: Work with other landowners to coordinate preservation and restoration of habitats, water quality and quantity, and other natural values within the watershed. | | | |
| Actions | Phase | Polygons | Details |
| 1. Work with other landowners to inventory, prioritize, protect and restore habitats elsewhere in the watershed. | 2 | n/a | Coordinate with landowners to identify sites that have habitats or rare species that should be protected, and lands with good potential for restoration, with emphasis on maintaining or restoring ecological connectivity and stream water quality and quantity throughout the watershed. Explore using conservation easements and acquisition to protect other lands in the watershed. |
| Objective C: Work with City, County, and regional planning agencies in planning for watershed health. | | | |
| Actions | Phase | Polygons | Details |
| 1. Work with City, County and other agencies. | 1 | n/a | Identify priorities for protection, restoration and connectivity of habitats and maintenance of streamwater quality and quantity within the watershed. |
| 2. Coordinate with City on location of easements. | 1, 2? | To be determined | Work with city to locate utility easements offsite. If necessary to locate onsite, develop plan to locate in areas that will minimize impacts to site resources. |
| Objective D: Coordinate restoration, education and recreation activities with other agencies and organizations which have compatible goals. | | | |
| Actions | Phase | Polygons | Details |
| 1. Coordinate volunteers. | 1, 2 | n/a | Coordinate with agencies and interested organizations to utilize volunteers to assist with restoration, education, monitoring and site maintenance. |
| 2. Form partnerships for seed | 1 | n/a | Coordinate native plant seed collection and propagation with other |



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| collection and plant propagation. | | | landowners and interested parties in the central Willamette Valley both for use on the GLT site and to provide for restoration activities elsewhere. Potential partners could include the City of Corvallis, Benton County, Oregon State University, Confederated Tribes of the Grand Ronde and/or Siletz, the Institute for Applied Ecology, The Nature Conservancy, private nursery operators, and landowners within the Jackson-Frazier watershed and elsewhere in the central Willamette Valley. |
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Goal 4: Conduct baseline and periodic monitoring to evaluate changing site conditions.

Objective A: Design and implement a monitoring system to evaluate effects of restoration treatments, habitat condition, and populations trends of rare and invasive species.

| Actions | Phase | Polygons | Details |
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| 1. Design and implement a monitoring system. | 1 | all | Design a practical monitoring system to track changes over time. Potential monitoring objectives include measuring success levels of restoration methods, determining whether restoration targets are being achieved, early detection of exotic plant and animal infestations, detection of woody plant encroachment, and providing feedback for adaptive management. The monitoring system will be detailed enough to provide usable information, but simple enough to be utilized over the long-term. Schedule periodic remeasurements at frequencies consistent with meeting monitoring objectives. |
| 2. Coordinate monitoring with site management activities through adaptive management. | 1 | n/a | Implement an adaptive management system in which data from the monitoring program are used to inform and adjust restoration and management of the site. This is critical in managing and restoring habitats to achieve desired target conditions. |



| Goal 4: Conduct baseline and periodic monitoring to evaluate changing site conditions. | | | |
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| 3. Install permanent photo points | 1, 2 | To be determined | Install permanent photo points to track coarse scale structural changes in vegetation. Utilize to document conditions before and after restoration treatments. |
| 4. Monitor vegetation. | 1, 2 | To be determined | Sample vegetation in habitat restoration areas before and after treatment to determine success of restoration methods and whether restoration targets are being met. Work with botanist to design sampling system that will generate relevant information. |
| 5. Monitor rare plant populations. | 1, 2 | To be determined | Monitor rare plants to determine population trends and provide early detection of threats. Monitor reintroduced rare plant populations to provide information on reintroduction success that can be used on site and elsewhere in the Willamette Valley. |
| 6. Monitor wildlife. | 1, 2 | all | Conduct periodic wildlife surveys to detect changes in wildlife use of the site. Repeat breeding bird surveys periodically to determine effect of restoration on bird use of the site. Use the same sample points and methodology as the Altman breeding bird study (Altman 2005). Conduct surveys for other wildlife including invertebrates, particularly rare species associated with prairies, savanna and riparian areas. |
| 7. Monitor cost of restoration and stewardship activities. | 1,2 | n/a | Monitor cost of restoration and stewardship activities over time to help analyze cost of restoration of Willamette Valley habitats and overall costs to GLT. |
| Objective B: Monitor annually for newly establishing invasive plant and animal species or other conditions that have potential to negatively impact the site. | | | |
| Actions | Phase | Polygons | Details |
| 1. Conduct periodic surveys for invasive exotic plants and animals, and encroaching woody vegetation. | 1, 2 | all | Survey annually for newly-establishing invasive species, encroaching woody vegetation or other conditions that have the potential to negatively impact the site. Concentrate surveys along potential introduction routes such as trails and riparian corridors. Utilize this information to identify and prioritize areas for control of invasives and woody vegetation |



| Goal 4: Conduct baseline and periodic monitoring to evaluate changing site conditions. | | | |
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| Objective C: Conduct water quality monitoring to maintain health of aquatic habitats. | | | |
| Actions | Phase | Polygons | Details |
| 1. Monitor stream water quality and quantity | 1, 2 | E, H, P | Monitor stream water quality to determine whether restoration activities are affecting water temperature, nutrient content, sediment load, etc. Monitoring can also give an indication of effects of upstream management activities and development on streamflow, water quality, offsite pollution and other impacts. |
| Objective D: Coordinate monitoring with research where possible. | | | |
| Actions | Phase | Polygons | Details |
| 1. Combine monitoring with research needs | 1, 2 | n/a | Design monitoring to be compatible with regional research efforts so that data can be used in broader studies of habitat restoration in the Willamette Valley. |
| 2. Document research and archive results | 1, 2 | n/a | Develop a system to document and coordinate all research done on the site to assure that research projects do not negatively impact the site or each other. Develop a system to archive all research results to ensure that a growing body of knowledge is preserved and available to inform management decisions and activities. |

