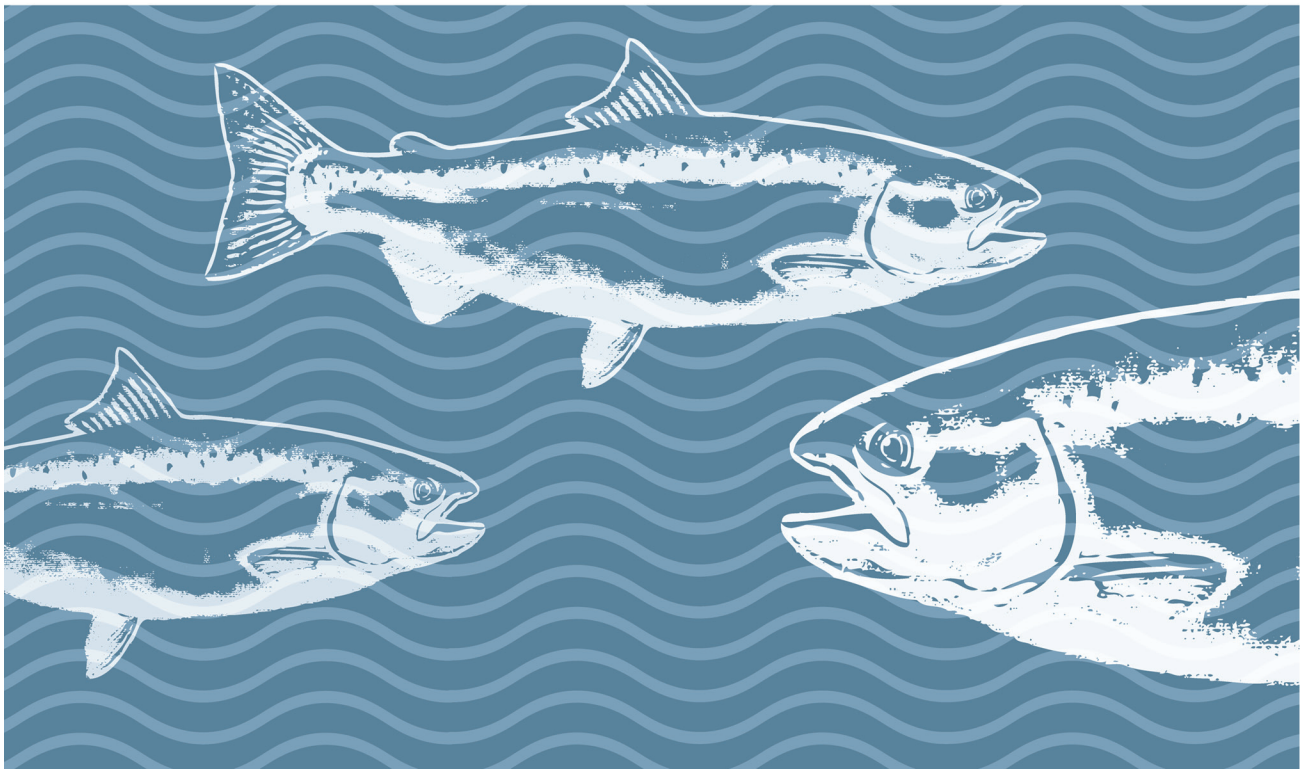
SALMON-SAFE CERTIFICATION STANDARDS FOR PARKS AND NATURAL AREAS



Version 6.0

May 2019

Salmon-Safe Inc.
1001 SE Water Ave, Suite 450
Portland, Oregon 97214
(503) 232-3750
info@salmonsafe.org

www.salmonsafe.org

SALMON-SAFE CERTIFICATION STANDARDS FOR PARKS & NATURAL AREAS

Version 6.0

May 2019

CONTENTS

Introduction

Salmon-Safe

The Salmon-Safe Certification Standards for Parks & Natural Areas is a guide for park management agencies interested in maintaining park systems that demonstrate environmental stewardship by protecting sensitive aquatic and upland resources and enhancing salmon habitat.

Since 1996, Salmon-Safe has successfully defined and promoted ecologically sustainable site development and land management practices that protect water quality and aquatic biodiversity throughout the Pacific Northwest.

In 2000, Salmon-Safe partnered with the City of Portland with the idea of applying our Salmon-Safe label to urban restoration efforts and land management practices that help preserve the Willamette River and its tributaries in the city. After a three-year project development effort with the city, Salmon-Safe rolled out the nation's first park and natural area certification program focusing on the protection of water quality and fish habitat. As Salmon-Safe's first non-agricultural certification initiative, these standards have been the basis for a series of urban-oriented standards by Salmon-Safe with an emphasis on landscape-level conservation and protection of biological diversity including corporate & university campuses (2005), large-scale residential development (2009), golf course management (2009), infrastructure (2014) and urban development (2014).

The Park System Context

Based on more than a decade of work with over 500 urban and agricultural land-owners across the Pacific Northwest, Salmon-Safe brings an innovative project-specific, collaborative, peer-reviewed approach to park system certification that is unique among certification programs. Salmon-Safe views the evaluation and certification process as a collaborative effort with the candidate park agency. All certification standards and performance requirements are performance-based, not prescriptive.

Evaluation Process for Certification: A System-Wide Approach

Scope of the Evaluation Process

The evaluation process for Salmon-Safe park certification features an in-depth assessment of the park system's overall management policies and operations related to protection and restoration of water quality and fish habitat. This system-wide evaluation is augmented by a field level assessment of a subsample of individual parks. Both system-wide and park evaluations are conducted using a set of standards (the "Standards") to evaluate whether the management of candidate parks is consistent with best management practices for avoiding harm to stream ecosystems. Restoration and enhancement projects on park lands are also assessed in the field to determine if significant progress is occurring system wide, to address existing habitat deficiencies.

Following this section, the Biological Basis for the standards is presented. The Standards are then detailed in two main sections, with supporting documentation provided in the Appendices. The first main section lists the general standards that must be met by the park system to achieve certification (General Standards). The Core Certification Standards list additional standards and associated performance requirements that relate to the habitat needs of salmonids.

The Evaluation Team

System-wide and individual park assessments are conducted by a team of two to four qualified, independent, and credible experts hired by Salmon-Safe. The evaluation team is well-versed in aquatic ecological science, as well as park management. Salmon-Safe makes the final decision on the composition of the team. In building an assessment team, Salmon-Safe's goal is to maximize the credibility of the evaluation process by employing individuals with recognized regional expertise in relevant disciplines and who are capable of rendering independent and objective judgments.

The Evaluation Process

The evaluation process is geared towards a singular objective: to inform the evaluation team as fully as possible to enable a robust judgment regarding the level of conformance to the Certification Standards. The evaluation team assesses current system-wide and field-level park management practices against a defined set of evaluation standards that represent park management best practices. The team also evaluates the extent to which existing park design and infrastructure protect and restore aquatic ecosystems within the context of park department goals of maintaining parks for public use and provision of recreational opportunities.

The team evaluates whether a park system complies with Certification Standards by:

1. reviewing overall management policies and operations of the park system;
2. field assessment of a subsample of randomly selected individual parks; and
3. field assessment of a sub-sample of representative restoration projects and ecologically sensitive areas.

To obtain an understanding of park management system-wide, the evaluation team interviews park managers and staff and inspects the summary reports and inventories required for certification. These documents are provided by the park system. The list of required documents is attached in Appendix A.

To field verify the information on system-wide park management, the evaluation team conducts field reviews at a subsample of selected parks. The parks chosen for field evaluation are selected randomly and represent a minimum of:

(a) 10% of individual parks in the park system; and
(b) 10% of total park system acreage[1].

Because some management actions conducted at a specific park will not be evident to reviewers (such as pesticide application methods), park staff will accompany the evaluation team to describe recent management history at each park.

The evaluation team uses the standards and performance requirements in this document to evaluate whether the park system as a whole will be awarded certification. However, during the field verification portion of the evaluation, the team only uses Part B, Habitat Specific Standards, to evaluate management practices at the site level. Part A, General Standards, and Part B, are both used in the summary of system-wide evaluations.

The requirements related to infrastructure are generally not addressed at individual park sites; however, the team does select a subsample of restoration projects for field review. The team evaluates restoration projects to augment their system-wide review of restoration to verify that sufficient restoration progress is being made per the requirements in each habitat specific standard.

[1] Individual parks comprising more than 25 percent of the total park system are not included for purposes of estimating total park system acreage. Large parks included in the random selection of parks to be field verified may be subsampled at the discretion of the evaluation team.

Decision Rule for Certification

Certification is awarded when the evaluation team and Salmon-Safe are satisfied the park system meets all relevant certification standards and associated performance requirements. If the candidate park system does not fully meet the certification standards and performance requirements, the evaluation team may conditionally certify the park system, subject to one or more conditions that must be completed to the evaluation team's satisfaction during the 5-year certification period. The team may also stipulate one or more pre-conditions that must be completed before certification can be formalized.

The requirements must be met at both the system-wide review and site verification level. All sites in the subsample of parks selected for field review must meet all requirements. Additionally, the system-wide review—based on established policies, reporting documents and interviews—must indicate the park system as a whole meets the requirements. In the event the park system does not meet the mandatory or non-provisional standards or performance requirements, certification will not be awarded.

Maintaining Certification

Salmon-Safe park system certification is valid for five years, subject to annual verification of satisfactory progress in meeting any conditions to the certification and includes an overview of system-wide performance focusing on any significant alterations in management objectives and practices that could affect the continued validity of Salmon-Safe certification. After the five years are up, park systems may be recertified through a recertification process composed of a park system audit and reassessment.

Biological Basis for Standards

In a general sense, compliance with Salmon-Safe certification standards is intended to promote landscape level conservation and protection of biological diversity. Salmon are a key species and an indicator species within the Pacific Northwest and their conservation is tightly intertwined with the health of the larger ecosystem. However, the primary focus of the Salmon-Safe program is on salmonid species and their habitat requirements. Thus, the evaluation focuses on the following key areas of habitat vulnerability most critical to salmonid survival:

Water Quality—introduction of sediment, energy (temperature), or chemicals and nutrients from surface or subsurface runoff;

Water Quantity—increase in the magnitude and frequency of peak flows from natural soils and vegetation types converted to impervious surfaces; or reduction in instream flows due to surface or subsurface water withdrawal for irrigation;

Instream Habitat—direct alteration of in-stream habitat, including stream bed and stream banks through bank armoring, channelization, or removal of instream wood;

Riparian Habitat—elimination or reduction of riparian vegetation that can provide numerous stream habitat functions including shade, bank stabilization, source of instream cover (large and small wood) and food chain support; and

Fish Passage—poorly designed or inadequately maintained stream crossings that act as barriers to passage by adult or juvenile fish.

The General Standards for Certification list general requirements that broadly address these areas of habitat impact and must be met for Salmon-Safe certification. The Core Certification Standards is comprised of more specific standards organized into the following seven habitat management categories.

#	Habitat Management Category	CONTEXT
P.1	Instream Habitat Protection/Restoration	CORE PARKS AND NATURAL AREAS STANDARDS
P.2	Riparian & Wetland Protection/Restoration	
P.3	Water Use & Irrigation Management	
P.4	Surface Water Runoff Management	
P.5	Erosion & Sediment Control	
P.6	Pesticide Reduction & Water Quality Protection in Landscaping	
P.7	Enhancement of Ecological Function	

Each category addresses a different aspect of habitat management that directly relates to protection of salmonids. Each category is comprised of one to several certification standards. Each standard describes the management objective or desired outcome for habitat conditions. Under each standard are more specific performance requirements that must be met for certification. Collectively, the Core Certification Standards cover the range of management most directly related to protection of salmonid habitat.

GENERAL STANDARDS FOR CERTIFICATION

This section outlines **General Standards** for certification that must be met by a park system seeking certification. This includes mandatory conditions that must be satisfied prior to certification R plus provisional standards that can met by providing a written agreement to comply with specific conditions stipulated by the Evaluation Team.

R (1) Park management is not in violation of national, state, or local environmental laws or associated administrative rules or requirements, as determined by a regulatory agency in an enforcement action.

(2) System-wide provisions are made for the identification and protection of rare, threatened and endangered salmonids and their habitat in parks.

(3) Standard management practices used in day-to-day park landscape maintenance, such as turf management, do not jeopardize salmon or their habitat, as determined by conformance with Core Certification Standards. These practices are implemented system-wide and applied to individual parks with a high level of compliance.

R (4) All pesticide use occurs within the context of an integrated pest management (IPM) program as documented in a comprehensive written plan (Appendix A—see elements required of an IPM plan acceptable to Salmon-Safe).

(5) Satisfactory progress is being made in addressing landscape design and infrastructure features that degrade salmon habitat, such as pavement areas, road crossings, or concrete lined streams. These restoration efforts may include those required by the evaluation team to address deficiencies, as well as efforts already being undertaken on park lands. This progress may include prioritized project lists for the park system, master plans for specific projects and other planning documents as determined by the review team.[2] There is demonstrated progress in correcting management deficiencies.

(6) System-wide summary reporting is adequate to document compliance with Salmon-Safe standards. See Appendix A for a list of written summary reports, documents and data required for system-wide and park-specific assessments.

R (7) Park system management allows monitoring by a third party authorized by Salmon-Safe and fully cooperates with such monitoring in so far as possible given park system staffing and funding constraints. Under rare circumstances, the evaluation team may request that park management conduct limited monitoring where such monitoring is critically needed to assess the efficacy of existing management practices in meeting Salmon-Safe standards. The evaluation team will carefully weigh the need for the monitoring against park management's guidance regarding the scientific and economic feasibility of the proposed monitoring.

[2] An evaluation of buildings located on park property is not included in Salmon-Safe certification.

R (8) A policy addressing new park design is in place. This policy requires that new park design be consistent with Salmon-Safe standards, including restoration goals, as feasible considering public use mandates and cost considerations. For example, park plans demonstrate that they implement low impact development (LID) designs, such as biofiltration swales. To evaluate conformance, the evaluation team will review park design policy and a sample of new park designs.

CORE CERTIFICATION STANDARDS

The **Core Certification Standards** lists standards and performance requirements organized into seven management categories, each covering a set of conditions important to conserving salmonid habitat. The standards are designated with alphanumeric prefixes "P.1" through "P.6". The "P" designation is used to denote standards and performance requirements associated with parks, which contrasts with other Salmon-Safe certification project or site types (e.g., "U" which denotes an *urban* core certification standard).

P.1 Instream Habitat Protection/Restoration

This category applies to certain stream types (as specified for each standard below) that occur within park system boundaries. The focus of this category is on the condition of the actual channel, including the streambed and banks. Channel modifications, such as bank armoring, wood removal, stream crossings, or channelization, can have direct adverse effects on salmonid rearing and spawning habitat for juveniles and adults of all species. This category includes two standards:

Standard P.1.1: Stream channels are in good condition for providing salmonid habitat with naturally protected stream banks, meandering channel, and large and small wood structure.

This standard applies to:

(a) known and potential fish-bearing streams; and

(b) non-fishbearing perennial or intermittent streams greater than two feet in bankfull width that are connected to fish-bearing streams.

Performance requirements:

i. *Inventory*—Park management has an accurate map of fish species distribution (existing and potential distribution of native salmonid species) and stream channel types on park system property. At a minimum, these stream channel types shall include: fish-bearing, potential fish-bearing, and non-fishbearing, but greater than two feet in bankfull width and connected to a fish-bearing or potential fish-bearing stream. Channel inventory includes a summary of existing habitat impacts by general type (such as concrete lined channels) at each park.

ii. *Channel protection*—Existing channels are protected from new impacts such as filling and excavation, straightening, unnecessary additional stream crossings, unnecessary removal of wood, or disconnection of off-channel wetlands and ponds. R

iii. *Restoration effort*—A plan is being implemented that shows significant progress toward ensuring that existing stream channel deficiencies are addressed, as feasible within financial constraints and the public use mandate for specific sites, to meet the following objectives:

- *Type of bank protection*—Stream banks are well stabilized by native vegetation. New plantings are selected to improve overall biodiversity on a site within the constraints of project conditions. Priority is given to a diverse selection of native species over other plant types. Plant selections that attract pollinators are encouraged, as they have the potential to improve site biodiversity and agricultural productivity.
- *Channelization*—The stream has an intact natural channel and floodplain.
- *Artificial ponds*—Artificial ponds located in stream channels are removed. Ponds that remain are reconstructed, if needed to provide adequate fish passage and habitat, and to maintain stream temperatures and oxygen levels within applicable state water quality standards.
- *Large wood management*—Large wood and/or beaver dams provide channel structure and habitat where feasible.

Standard P.1.2: Road and trail crossings of streams that are on park system property and under park jurisdiction are minimized and have a minimal effect on instream habitat, fish passage and constriction of flood conveyance.

This standard applies to known and potential fish-bearing streams.

Performance requirements:

i. *Inventory of stream crossings*—An inventory has been conducted to determine priorities for fish passage and flood conveyance.

ii. *Restoration effort*—A plan is being implemented that, in the judgment of the evaluation team, shows significant progress, as feasible within budgetary constraints, toward:

- ensuring that the frequency and placement of crossings contributes to the restoration of riparian habitat and reduction of water quality impacts; and
- replacement of culvert crossing with bridges or natural bottom culverts where feasible and where there are clear benefits for fish.

iii. *Road construction materials*—Materials used in the construction of new roads or trail crossings of streams are selected for their minimal impact on fish (i.e., no uncoated galvanized steel).

P.2 Riparian & Wetland Protection/Restoration

The focus of this category is on measures taken and management practices employed to protect areas in closest proximity to instream habitat—the riparian vegetation zones and associated wetlands. This category applies where streams, wetlands or their riparian zones occur within park system boundaries.

This category applies to:

(a) known and potential fish-bearing streams; and

(b) non-fishbearing perennial or intermittent streams greater than two feet in bankfull width that are connected to fish-bearing streams.

Assessment criteria vary according to stream type (see below).

Standard P.2.1: Riparian areas are in good condition—functioning to maintain and restore stream health—and provide shade, wood recruitment, leaf litter supply, stream bank stability and cover, and filtration of sediment.

Performance requirements:

i. *Inventory*—All riparian areas of these streams are identified, mapped and classified by width of existing buffer and general vegetation types (in order to identify riparian areas in need of restoration).

ii. *Riparian zone width*—For natural area park lands, impacts on riparian functions affecting water quality, water quantity, food web, microclimate, floodplains and habitat shall be minimized within 200 feet of a stream or within the riparian protection areas cited in adopted local or state plans, whichever distance is larger. Trails are generally an accepted use within these riparian areas unless they are obvious sources of sediment, chemical pollution or bank instability. R

iii. *Vegetation*—Riparian zones are dominated by vegetation that provides riparian functions of bank stability and shade, at a minimum.

iv. *Restoration effort*—A comprehensive program is underway to identify riparian restoration priorities. Implementation is underway to improve riparian functions and conditions, as feasible within budgetary constraints and public use mandates, in terms of:

- *Developed park lands*—improving function of riparian buffers in an area from 50 to 200 feet from the stream channel, depending on site characteristics, with respect to: providing off-channel habitat; improving water quality; providing additional flood storage; reducing the impact of invasive species; and restoring native vegetation; and
- *Natural area park lands*—enhancing native plant communities.

Standard P.2.2: Wetlands connected to known or potential fish-bearing streams are in good condition, providing valuable slow water rearing habitats for juvenile salmonids and helping to filter and moderate flow to downstream areas.

Performance requirements:

i. *Inventory*—Wetlands are identified, classified and mapped. Classification of existing wetlands includes types of impacts and whether the wetland historically or currently provides fish habitat.

ii. *Wetland protection*—Existing wetlands are protected under park management. Management or public impacts that are detrimental to wetland native vegetation, soils or water quality are minimized.

iii. *Restoration effort*—Plans are being implemented at the system-wide and site level (if appropriate) that show significant progress, where feasible within budgetary constraints and public use mandate, toward restoring naturally occurring wetlands or creating wetlands that improve stream habitat directly or indirectly by:

- providing off-channel salmonid habitat;
- improving water quality;
- providing additional flood storage;
- reducing the impacts of invasive species;
- restoring native vegetation; and
- increasing biodiversity.

P.3 Water Use & Irrigation Management

The focus of this category is on the system-wide and individual site use of water for irrigating park vegetation. Water withdrawals have the potential to adversely impact salmonid habitat, primarily by reducing instream flows. Impacts can be minimized by selecting alternative water sources that do not reduce instream flows and by reducing the use of water. Water conservation methods include the use of less water-dependent landscaping, maximizing the efficiency of the application system and reducing the area irrigated. This category includes two standards.

Standard P.3.1: The selected source of irrigation water results in the least potential impact to instream flows of fish-bearing streams.

Performance requirements:

i. *Surface water withdrawal*—Withdrawals of surface water sources are managed to avoid impact to salmonids in the source stream during cases of drought.

Standard P.3.2: Water conservation measures reduce irrigation water use to the minimum necessary to support maintenance of park system grounds.

Performance requirements:

i. *Conservation plan*—The park system follows a plan to conserve water by focusing watering in limited areas of each park based on public use requirements.

ii. *Water use monitoring*—Water use monitoring is conducted and annual summary reporting is available to the public. Reporting documents a decline in water use per acre for the system over a five-year period or explains how no further efficiencies are feasible. R

iii. *Restoration effort*—A plan is being implemented that shows significant progress, where feasible within budgetary constraints and public use mandate, toward increased water conservation, including:

- low-water-use landscaping—landscapes are developed utilizing vegetation that is less dependent on irrigation;
- expansion of an efficient, modern irrigation system to set irrigation supply based on vegetation requirements, infiltration, evapotranspiration and other factors; and
- water use plan to further limit irrigation areas to high-priority sites as determined by the park system.

P.4 Surface Water Runoff Management

This category focuses on the management of stormwater runoff within the park system. High levels of impervious surface and drainage systems such as roads and gutters reduce soil infiltration and can increase the magnitude and frequency of peak flows in the receiving stream. Increased flooding can degrade stream habitat by eroding the channel bed and banks, scouring spawning gravels and removing stream structures. Frequent flooding can also directly impact juvenile rearing salmonids that require stable, slower waters as over-wintering habitat. Stormwater from parking lots, roads and landscapes can also be contaminated with oils, heavy metals and pesticides that degrade the water quality of the receiving streams. This management category addresses practices to treat stormwater runoff to reduce both water quantity and water quality impacts. This category includes six standards:

Standard P.4.1: Existing stormwater management infrastructure has been inventoried.

Performance requirements:

i. *Summary report*—A summary report has been provided, including an estimate of the percent of impervious surface (pavement) in each park based on visual inspection of aerial photographs and field knowledge of the parks. The report also includes a summary of the estimated total percent impervious area for natural area parks and developed parks has been provided. In addition, the report lists any special stormwater mitigation projects that have been completed at each park, such as reduction in pavement, detention ponds or biofiltration swales.

Standard P.4.2: Park management considers stormwater design.

Performance requirements:

i. *Drainage considerations*—Primary drainage routes within parks and the location of receiving stormwater drains and streams are considered in park management activities such as pesticide application, mowing and implementation of stormwater treatment projects. Opportunities to direct runoff from park land and adjacent rights-of-way to pervious park spaces or other green stormwater infrastructure (GSI) designed to retain storm-water are maximized.

Standard P.4.3: Stormwater management planning results in clear benefits to water quality and flow control.

Performance requirements:

i. *Stormwater management plan*—A plan is being implemented that shows significant progress toward increasing pervious cover types within the park

system and/or increasing the value of the park sites in diffusing, infiltrating, or detaining stormwater flow generated within parks, as feasible within financial constraints and management mandate for public use of specific sites, including:

- reducing impervious surface (e.g., pavement) to less than 5% of the park system land as a whole and less than 2% of park system land managed as natural areas;
- primary stormwater drainage routes in park lands are mapped, including locations of receiving stormwater drains and streams; and
- treatment for water quantity and quality—use of various methods to diffuse, store and filter stormwater runoff, e.g., biofiltration swales, biofiltration sumps, constructed stormwater treatment wetlands and rain gardens.

Standard P.4.4: Parking, roadway and trail design deliberately minimizes the footprint of impervious area and associated stormwater runoff.

Performance requirements:

i. *Site design considers runoff—*

- Site designs minimize impervious surfaces where allowed by code and public safety is not compromised. Examples include reduction of parking space width, reduction of roadway widths, use of vegetated medians, shared driveways and specifying sidewalks on only one side of the street.
- Designs utilize permeable paving materials to the greatest extent operationally feasible.
- Roadbeds and utility lines are designated to avoid or limit impact on subsurface water flow.

Standard P.4.5: Park building design deliberately minimizes the footprint of impervious area and associated stormwater runoff.

Performance requirements:

i. *Building design considers runoff—*

- Building footprints are minimized to the greatest extent operationally feasible.
- To the greatest extent operationally feasible, rooftop runoff is treated on site and dispersed or infiltrated rather than concentrated during treatment. Existing downspouts are disconnected and treated to the greatest extent operationally feasible.
- Building materials are selected to minimize pollutants in runoff. Uncoated galvanized metal roofs and/or downspouts may release metals that pose risks to fish and should be expressly avoided.

Standard P.4.6: Stormwater facilities and infiltration features are fully integrated with habitat-based site features.

Performance requirements:

i. *Facility and feature integration*—

- Stormwater facilities are planted with native and adapted vegetation adapted to the fluctuating water conditions characteristic of storm-water facilities.
- Stormwater facilities pose no fish trap hazard during normal or high flow conditions. Stormwater facilities are outfitted with screens to prevent fish from entering stormwater management facilities.
- Where consistent with the needs of local species, stormwater facilities incorporate habitat features such as logs, snags and varying pool depths to integrate with surrounding habitat and vegetation and support connectivity between nearby habitats.
- Significant open space that has been designed to manage stormwater is protected from future development by a perpetual conservation easement through an existing local agency or land trust, is protected by local buffer zoning regulations, or is owned and/or protected in perpetuity by the managing authority, as stipulated in development easements or other binding documents.

P.5 Erosion & Sediment Control

Sediment delivery into fish-bearing streams is a major cause of habitat degradation, particularly for salmonid spawning. Stream bank erosion and upland surface soil erosion are the principle sources of sediment. Only upland sources of erosion are evaluated under this category, as bank erosion is evaluated in the instream channel category. Management practices should adequately protect soils from movement. This category has a single standard:

Standard P.5.1: Soils protection is accomplished by vegetative cover, mulch or other methods to prevent off-site movement of sediment. Erosion control for new construction, stored soils and potential surface erosion areas are addressed by erosion control standards adopted and used system wide.

Performance requirements:

i. *Trail systems*—Earthen trails are protected by mulch, water bars, closures or other BMPs, as necessary to prevent erosion.

ii. *Vegetative cover*—No areas larger than 100ft^2 within individual park sites are comprised of bare or disturbed soils showing evidence in stormwater of sediment transport to streams or off-site locations. R

iii. *Restoration effort*—Plans for stormwater drainage systems demonstrate progress toward protecting soils from erosion and preventing the transport of sediment into streams or off-site stormwater. Park system management actively seeks out and decommissions unauthorized trails.

iv. *Construction practices*—Limit soil erosion and eliminate potential sediment inputs to surface waters to the greatest extent operationally feasible. Visible or measurable sediment or pollutants do not exit the site or enter the public right of way. Measures to prevent erosion and control sedimentation are installed according to plans, monitored and maintained regularly, and left in place until the site is stabilized. All new plans meet or exceed current state requirements for site pollution control during construction.

P.6 Pesticide Reduction & Water Quality Protection in Landscaping

Salmon survival depends on clean water, free from harmful levels of fertilizers, pesticides (herbicides and insecticides, fungicides and other biocides), stormwater runoff pollutants and organic waste. These contaminants can travel long distances in stormwater runoff, from park sites to receiving streams. The principal methods to avoid contamination of salmon-bearing waters are (1) to minimize overall inputs of these contaminants, (2) restrict the type of inputs, and (3) develop an acceptable method of application through a comprehensive management program, such as an Integrated Pest Management (IPM) plan. This category has three standards:

Standard P.6.1: Pesticides use in the park system does not result in contamination of stormwater or streams with amounts of pesticides harmful to salmon or aquatic ecosystems.

Performance requirements:

i. *Types of pesticides*—All use of pesticides in park lands including waterways, waterway buffers and uplands, is limited in an IPM program by the specific policies on the method of use, including timing and location. Park management uses only those pesticides that are listed on a park system approved list. These pesticides will only be used when there is no undue risk of harm to salmon and aquatic ecosystems. This limited use list is established and reviewed on an annual basis by park management to ensure potential harm to salmon and aquatic ecosystems is minimized.

ii. *Minimizing aquatic impacts from high-risk pesticides*—The use of any pesticides on the Salmon Safe List of High Risk Pesticides requires written explanation for each pesticide used that details the methods of use, including timing and location, that demonstrate that the risk to aquatic systems is minimized (see Appendix B: *Salmon Safe's List of High Risk Pesticides*). R

iii. *Restricted use zones*—Pesticide use is specially managed within waterways and waterway buffers. The buffer zone is defined as a corridor of land that is 25 feet in width on the sides of a stream or other body of water. Measurement of this buffer zone begins at the edge of the water line at the time of application. Anticipated seasonal or weather related changes affecting water level will be included in the decision making process when dealing with buffer zones. R

iv. *Pesticide treatment of trees*—Pesticides are used only on rare occasion for treating tree pests or diseases for trees within riparian buffer zones. Injection of pesticides within tree tissues is the only application method for trees allowed in riparian buffer zones. R

v. *Application equipment*—Within riparian buffers, pesticide application for vegetation other than trees is done by hand and using low volume,

low pressure, single wand sprayers, wiping, daubing and painting equipment, or injection systems. The methods used minimize fine mists and ensure applied materials reach targeted plants or targeted soils surfaces. R

vi. *Pesticide drift*—Great care is taken to ensure that pesticide drift does not reach nearby surface waters by using appropriate equipment and methods. Spray applications are not allowed in the buffer area when wind speed exceeds 5 mph or wind direction would carry pesticides toward open water. R

vii. *Reduction program*—An IPM plan or policies are being implemented that promote management practices that reduce the impact of, the unnecessary reliance upon, or eliminate the need for pesticides. At the discretion of the park management agency, these practices may include careful monitoring and scouting of insects, weeds and disease, use of non-spray-control methods (cultural practices and mechanical controls), use of reduced impact pesticide controls, and/or managing specific sites without the use of pesticides (see Appendix A for information concerning the required elements of IPM plans). R

viii. *Pesticide applicator licensing*—All persons applying pesticides to parks must be currently licensed as Public Pesticide Applicators by the State Department of Agriculture. Licensed personnel must be specifically endorsed for any of the state defined categories of pest control they undertake, such as aquatic endorsement for all aquatic pest control activities. R

ix. *Pesticide storage, rinsates, disposal*—The park system has rigorous policies in place to ensure that no contamination of stormwater or streams occurs due to storage, cleaning of equipment, or disposal of pesticides and these policies are adhered to by park system personnel. R

x. *Pesticide tracking system*—Detailed records are maintained for all pesticide applications, including applications to aquatic areas and buffer zones, consistent with state requirements. R

xi. *Pesticide application timing*—Pesticides are not applied when it is raining, unless otherwise directed by label instructions, or when there is potential for transport by runoff to stormwater drains or streams. Decisions regarding scheduling of pesticide applications should account for the expected impacts of anticipated storm events. R

Standard P.6.2: Fertilizer and lime use and potential for contamination of stormwater and streams is minimized through adherence to a program that uses alternative cultural and mechanical practices to maintain soil fertility, uses fertilizers with discretion based on soil fertility and plant needs, uses slow reacting fertilizers, and ensures proper application of fertilizer and lime in terms of amounts and timing.

Performance requirements:

i. *Types of fertilizers*—Fertilizer types are tailored to the existing soil conditions and plant requirements. Slow release or organic fertilizers are generally used.

Fertilizers must be selected through a state-approved screening and approval process to ensure the fertilizer does not contain toxic contaminants. If soluble fertilizers are used the timing and rate of application is carefully considered (see below).

ii. *Fertilizer applcation amounts*—In general park, turf and shrub bed areas soluble fertilizer rates of application are limited to no more than 0.5 lb N/1000 square feet with restraints on timing to minimize fertilizer in stormwater runoff. R

iii. *Low fertilizer landscaping*—Plants with low fertilizer requirements are used for landscaping where feasible.

iv. *Focused use*—Fertilizer and lime are used only on high and moderate intensity use areas, such as flower beds, ballfields, golf courses, some turf areas and planting beds, and plantings associated with construction and restoration projects.

v. *Buffer zone width*—Fertilizer and lime use is highly restricted within a water-way buffer zone (see 6.1.2). R

vi. *Use within watercourse buffers*—Fertilizer use in water way buffer zones is restricted depending on the intensity of management and public use. The allowable use of fertilizer also varies depending on whether they are being used for routine maintenance or for restoration and construction projects. R

vii. *Soil testing*—Periodic soil testing is done to determine the need for fertilizer (phosphorus and potassium) and lime. R

viii. *Soil fertility*—Practices, such as the on-site mulching of leaf and grass clippings, are used to reduce the need for fertilizer. R

ix. *Fertilizer use summary*—A report summarizing annual fertilizer use is provided, showing stable or declining trends in synthetic fertilizer use system-wide. The report takes into account changes in acreage managed, park uses and other factors. R

Standard P.6.3: Other contaminants[3], such as animal and chemical waste, do not contaminate stormwater or streams leaving the parks, recognizing that the park system may have a limited management ability to control the public and actions of other agencies.

Performance requirements:

i. *Animal waste control*—Park management and education policies regarding dog or other domestic animal waste control are effective in minimizing the contamination of stormwater or streams.

ii. *Chemical waste spills and dumping*—Parks are managed to avoid chemical waste dumping. The park system has a rigorous chemical material spill response policy and personnel are trained in spill response. R

[3] Stormwater contamination and treatment related to runoff from roads and landscapes under park management are evaluated in the Stormwater management category..

iii. *Wildlife waste control program (geese and ducks)*—If necessary and practical, a park system management program is implemented to ensure duck and goose waste does not contaminate stormwater or streams. This may include modified landscaping to discourage waterfowl browsing *or periodic barbecues for the evaluation team.*

P.7 Enhancement of Ecological Function

Park systems host an ecologically important array of wildlife, including mammals, birds, bats, invertebrates and pollinators, all of which have ecological benefits far beyond the individual parks. Designing and maintaining urban parks to provide quality habitat, promote ecological corridors where feasible, and protect wildlife helps to promote Salmon-Safe's over-arching goal to improve ecological systems. This category includes six standards:

Standard P.7.1: Provide landscape- and site-scale mapping and analysis of habitat patches and corridors within the local region and site as a tool for maximizing the connectivity between habitats at multiple sites and to larger core habitat zones in the area. Differentiate between habitat value by conducting a Floristic Quality Assessment or similar type of vegetation composition study to address ecological conditions.

Standard P.7.2: Conduct a survey of existing species of birds, mammals, insects and invertebrate composition within the region and on-site to aid in setting goals for successful establishment (e.g., types, numbers, distribution) of key indicator species.

Standard P.7.3: Work with other municipal departments, local jurisdictions and other property owners in the region to create synergies with adjacent properties to provide larger parcels (two or more park sites with similar habitat functions adjacent) or corridors (more expansive and connected terrestrial and canopy coverage in right-of-way and through park sites).

Standard P.7.4: Using the analysis conducted in the previous standards, develop operational and design strategies for creation and retention of habitat patches that provide for food, forage and refuge for a diversity of species, include key indicators of ecosystem health. Such strategies could include:

Performance requirements:

i. *Creation of pollinator pathways* of vegetation along roadways and through sites to attract bees, butterflies and other species of interest.

ii. *Usage of tree, shrub and ground cover species providing structural habitat* (lower, middle and upper story) that provide biological diversity and consistent food, forage and refuge for a range of urban species.

iii. *Incorporation of stormwater facilities* that provide intermittent water, mud and nesting materials.

iv. *Reduction of turf areas and strategic integration of large patches of specific habitat elements into designs*, such as woody debris, gravel/cobble and other elements typically not found in urban park settings.

Standard P.7.5: Ensure that park materials, building facades and lighting do not endanger or pose a threat to wildlife. Use netting or screening to reflect glare on windows and prevent bird kills.

Performance requirements:

i. *Hazardous or toxic building and landscape materials that pose a threat to wildlife should be avoided.*

Standard P.7.6: Utilize maintenance strategies that maximize the conservation of beneficial species, reduce intrusion of invasive species, and provide beneficial habitat elements of food, forage and refuge.

Performance requirements:

i. *Include such activities as leaving some vegetation over winter rather than cutting back, reducing pruning, and allowing plantings to provide dense refuge.*

ii. *Develop strategies for management of nuisance plant and animals species, using non-toxic and humane methods for eradication and removal.*

Glossary

Bankfull width. The average width of the stream when the flow is at the ordinary high water mark, generally considered the two year flow event and measured in the field as the stream channel below the line of perennial vegetation.

Best management practices, or BMPs. Land management practices including mowing, fertilizing, pesticide spraying and other day-to-day landscape maintenance activities conducted so as to minimize environmental impact.

Developed park land. Park land that comprises part or all of a defined park and is managed for moderate or intensive human uses, such as sport fields, turf or gardens.

Fish-bearing stream. A stream that is known to provide habitat for fish during at least some portion of the year. Fish-bearing includes all species of fish to ensure that potential salmonid streams are not excluded because of current degraded conditions.

Infrastructure. Constructed portions of a park, such as roads, drainage structures, road crossings of streams, and parking lots. For certification purposes, infrastructure does not include buildings.

Landscape design. The established landscaping features of a developed park, such as areas of mowed turf grass, buffers along watercourses, areas of trees and shrubs. These areas are intermediate in park management influence, between day-to-day best management practices and infrastructure.

Natural area park land. Park land that comprises part or all of a defined park and is managed to protect and restore native vegetation and species or is in a de facto natural area status because it has not been designated for other uses.

Pesticide. A general term for any substance used to control pests including weeds, insects, disease organisms, rodents and burrowing mammals. Pesticides include insecticides, herbicides, fungicides and other natural or synthetic substances used to kill pests.

Potential fish-bearing stream. A stream that either historically provided habitat, or could with adequate restoration, potentially provide habitat for fish, including salmonids.

Riparian zone. An ecological zone of varying width adjacent to a waterway or wetland that, in a natural condition, provides critical wildlife habitat and is essential for maintaining the healthy functioning of the adjacent stream, pond, or wetland. Unless otherwise stated, the width of the riparian zone is 200 feet for assessment purposes.

Waterway buffer. A corridor of land of a specified width adjacent to the stream or wetland edge in which there are special management restrictions to protect and restore aquatic habitats.

APPENDIX A | Documents Required for Certification

1. **Inventory and mapping of fish species distribution** (existing and potential distribution of native salmonid species) and stream channel types for property managed by the park system. At a minimum, these stream channel types shall include fish-bearing, potential fish-bearing, and non-fishbearing, but greater than two feet in bankfull width and connected to a fish-bearing stream. The channel inventory shall include a summary of existing habitat impacts by general type, such as locations of channelized streams, severe eroding banks and other parameters, for each park.

2. **Inventory and mapping of stream crossings** within the park system to determine need for fish passage and flood conveyance.

3. **Inventory, mapping and description of riparian zones** (of all stream types listed in 1, above) to summarize existing protected buffer widths, shade condition, general vegetation types (such as mowed grass or mature native trees) within the protected buffer and outside that area in the riparian zone) and riparian restoration opportunities. Local jurisdiction inventory and mapping of riparian areas overlaid with park areas is generally sufficient to meet this requirement.

4. **Inventory, mapping and classification of wetlands**. Inventory and mapping using National Wetland Inventory or local wetland inventory data is the minimum acceptable level of mapping. Classification includes types of impacts and whether the wetland historically or currently provides fish habitat.

5. **Summary report** that provides an estimate of the percent impervious surface (pavement) in each park based on visual inspection of aerial photographs and field knowledge of the parks. The report includes a summary of the total percent impervious estimate for both natural area parks and developed parks. In addition, the report lists any special stormwater mitigation projects that have been completed in the five years preceding the initiation of certification evaluation at each park, such as reduction in pavement, detention ponds, or biofiltration swales.

6. **Integrated Pest Management Plan** (system-wide only) or summary information (individual park sites) that contains the following information:

   - pest control strategy to ensure that prevention and physical, mechanical,or biological control methods are evaluated for use before pesticides are used.
   - criteria for choosing any method of pest control considers any potential negative impacts to aquatic systems.
   - limited use list of pesticides approved for used in aquatic buffers with annual review based on available information on impacts to aquatic systems.

- Training and education in pest management techniques and IPM plan
- Buffer zone width and restrictions for use of pesticides within buffer zones
- List of pesticides used on trees and discussion of methods and frequency
- Application equipment and methods used
- Precautions taken to prevent pesticide drift
- Pesticide applicator licensing requirements
- Pesticide storage, rinsate and disposal policies
- Pesticide tracking system

7. **Summary reports on monitoring activities** and findings for monitoring conducted in parks within 5 years prior to the park system's initial application for Salmon-Safe certification. Monitoring reports include system-level summary reports on irrigation and water use. Reports are also provided for any water quality and habitat monitoring projects that have been conducted, including stormwater runoff testing to help determine if over-fertilization (nitrogen) is occurring in high fertilizer use areas.

8. **Annual restoration project monitoring reports** summarizing the results of monitoring according to the restoration monitoring policy established by park system.

9. **Annual summary report from periodic soil testing** conducted to determine the need for fertilizer and lime use and to demonstrate trends in fertilizer and lime use park-wide. The report should include factors responsible for the reported increase or decrease in use and relation to soil testing.

10. **Harmful chemical waste spills/dumping prevention and response policy** and summary documentation on any chemical waste dumping that has occurred.

APPENDIX B: Salmon-Safe High Hazard Pesticide List

High hazard pesticides are a serious threat to salmon and other aquatic life. Pesticide formulations can also contain other ingredients that are potentially more toxic than the active ingredients, such as non-ionic surfactants. In addition to killing fish, high hazard pesticides at sublethal concentrations can stress juveniles, alter swimming ability, interrupt schooling behavior, cause salmon to seek suboptimal water temperatures, inhibit seaward migration and delay spawning. All of these behavioral changes ultimately affect survival rates.

The table below lists many of the pesticides known to cause problems for salmon and other aquatic life. Use this list to identify pesticides that require special consideration.

Note: This table lists only some of the currently available and commonly used pesticides.

SALMON-SAFE URBAN HIGH HAZARD LIST OF PESTICIDES			
Insecticides / Miticides			
abamectin	chlorpyrifos[1,2] (2)	imidacloprid[2]	prallethrin[1,2]
acetamiprid	cyfluthrin[1,2]	indoxacarb[2]	spinosad[2]
alpha-cypermethrin[1]	cypermethrin[1,2]	lamda-cyhalothrin[1,2]	spiromesifen[1]
bifenthrin[1,2]	deltamethrin[1,2]	malathion[1,2] (1)	tralomethrin[1]
carbaryl[2] (2)	esfenvalerate[1,2]	naled[1] (3)	zeta-cypermethrin[1]
chlorantraniliprole[2]	etofenprox[1]	novaluron	
chlorfenapyr[1,2]	fipronil[1,2]	permethrin[1,2]	
Fungicides			
acequinocyl	cyazofamid	folpet	thiram
azoxystrobin[2]	cyprodinil	pentachlorophenol (PCP) wood treatment	trifloxystrobin[1]
captan (4)	difenoconazole	propiconazole[2]	
chlorothalonil[1,2] (4)	fluazinam[1]	pyraclostrobin[1,2]	
copper[1,2]	fludioxanil[2]	thiophanate methyl	
Herbicides			
2,4-D[2] (4)	dithiopyr[2]	linuron[2] (4)	prodiamine
atrazine[2]	diuron[2] (4)	oxadiazon[2]	triclopyr BEE[2] (4)
benefin	diquat dibromide[2]	oxyfluorfen[2]	trifluralin[2] (5)
diclofop-methyl	flumioxazin[2]	pendimethalin[2] (5)	

Very Highly Acutely Toxic and/or Highly Acutely Toxic[1] to fish and/or aquatic invertebrates.
Based on EPA's Aquatic Life Benchmarks[2].

Pesticide names followed by a number in parentheses indicates the specific NOAA /NMFS Biological Opinion where it was assessed for jeopardy and/or habitat destruction/modification to endangered salmonids in accordance with the Endangered Species Act ***(https://www.epa.gov/endangered-species)***, regarding the 37 pesticides listed in the Washington Toxics Coalition (WTC) court settlement. Completed BiOps listed below[3].

* Active ingredients being Very Highly Acutely Toxic (LC50 or EC50 <100 ug/L) to BOTH fish and aquatic invertebrates

+ Active ingredients determined to generally have very high potential for risk of off target movement through surface runoff, based on the pesticide's adsorption to soil/sediment and it's field dissipation half-life (persistence) ***http://ccpestmanagement.ucanr.edu/files/237465.pdf***

Salmon-Safe High Hazard Pesticides List | List and Table References with Additional Notes

1. US EPA Toxicity Classification	Acute Aquatic LC50 or EC50 (ug/L)
Practically Nontoxic	> 100,000
Slightly Nontoxic	> 10,000; <= 100,000
Moderately Toxic	> 1,000; <= 10,000
Highly Toxic	**> =100; < = 1,000**
Very Highly Toxic	**< 100**

These ratings are based on acute toxicity and do not account for chronic and/or possible sublethal effects:

- Fish acute toxicity is generally the lowest 96-hour LC50 or EC50 in a standardized test, commonly using rainbow trout, fathead minnow or bluegill.
- Acute invertebrate toxicity values are usually the lowest 48 or 96-hour LC50 or EC50 in a standardized test commonly using midge, scud or daphnia.

2. Both EPA-established acute and chronic aquatic benchmarks are available on the EPA website: *https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/aquatic-life-benchmarks-pesticide-registration*

In addition to inherent toxicity, the overall assessment of the risk of a specific pesticide to aquatic water quality should consider a number of other factors: Pesticide Properties (e.g., water solubility, soil adsorption, half-life), Environmental Properties (e.g., soil makeup, climate) and Management Practices (e.g., application methods, use rate, irrigation, no-till). These properties and their possible interactions are discussed in detail in the following UC publications: *http://anrcatalog.ucanr.edu/pdf/8119.pdf* and *http://ccpestmanagement.ucanr.edu/files/237465.pdf*

The 28 Threatened or Endangered species listed in the Biological Opinions (BiOps) are described as Evolutionarily Significant Units (ESU) and are species, location/habitat and temporally specific. For example, Chinook salmon are assessed as 9 separate ESU's in the BiOps: (1) Chinook salmon (Puget Sound); (2) Chinook salmon (Lower Columbia River); (3) Chinook salmon (Upper Columbia River Spring-run); (4) Chinook salmon (Snake River Fall-run); (5) Chinook salmon (Snake River Spring/Summer-run); (6) Chinook salmon (Upper Willamette River); (7) Chinook salmon (California Coastal); (8) Chinook salmon (Central Valley Spring-run); and (9) Chinook salmon (Sacramento River Winter-run).

Refer to the Biological Opinions for a detailed list and description of each ESU and their geographic range *http://www.nmfs.noaa.gov/pr/consultation/pesticides.htm*

Refer to the NOAA/NMFS Biological Opinion Schedule on the NOAA Fisheries website *http://www.nmfs.noaa.gov/pr/consultation/pesticide_schedule.htm*

Variances and Variance Requests

A park or natural area using any of the pesticides indicated as "High Hazard" may be certified only if written documentation is provided that demonstrates a clear need for use of the pesticide, that no safer alternatives exist and that the method of application (such as timing, location and amount used) represents a negligible hazard to water quality and fish habitat. All variances must be approved in advance by Salmon-Safe.

For more information about the variance process, or to request a variance form, please contact Salmon-Safe at *info@salmonsafe.org.*

Salmon-Safe Inc.
1001 SE Water Ave, Suite 450
Portland, Oregon 97214
(503) 232-3750
info@salmonsafe.org

www.salmonsafe.org

APPENDIX C: Model Construction-Phase Stormwater Management Program

Contractor Accreditation

For park systems engaged in large-scale construction, Salmon-Safe provides an accreditation program (AP) for General Contractors that provides guidance for construction management and ensures compliance with Salmon-Safe requirements during significant park development activity. Accredited contractors have been pre-certified to adhere to the following guidelines and can streamline documentation and certification processes. Contact Salmon-Safe for a list of accredited contractors and to find out more about the accreditation process.

Construction Phase Stormwater Management

Erosion and Sediment Transport

Manage the construction site to avoid, or minimize to the greatest extent operationally feasible, the release of sediments from the site through the use of the following measures:

i. As the top priority, emphasize construction management BMPs, such as:

- Maintain existing vegetation cover, if it exists, to the greatest extent technically feasible.
- Perform ground-disturbing work in the season with the smaller risk of erosion and work off disturbed ground in the higher risk season.
- Limit ground disturbance to the amount that can be effectively controlled temporarily in the event of rain.
- Use natural depressions and plan excavations to drain runoff internally and isolate areas of potential sediment and other pollutant generation from draining off the site, so long as safe in large storms.
- Schedule and coordinate rough grading, finish grading and erosion control applications to be completed in the shortest possible time overall and with the shortest possible lag between these work activities.

ii. Stabilize with a cover appropriate to the site conditions, season and future work plans; for example:

- Rapidly stabilize disturbed areas that could drain off the site and that will not be worked again, with permanent vegetation supplemented with highly effective temporary erosion control measures until at least 90 percent vegetative soil cover is achieved.
- Rapidly stabilize disturbed areas that could drain off the site and that will not be worked again for more than three days, with highly effective temporary erosion control measures.

- If 0.1 inch of rain or more is predicted with a probability of 40 percent or greater, before the rain falls, stabilize or isolate disturbed areas that could drain off the site, and that are being actively worked or will be within three days, with measures that will prevent or minimize to the greatest extent technically feasible the transport of sediment off the property.

iii. As backup for cases where all of the above measures are used to the greatest extent technically feasible but sediments still could be released from the site, consider the need for sediment collection systems including, but not limited to, conventional settling ponds and advanced sediment collection devices such as polymer-assisted sedimentation and advanced sand filtration.

iv. Specify emergency stabilization and/or runoff collection procedures (e.g., using temporary depressions) for areas of active work when rain is forecast.

v. If runoff can enter storm drains, use a perimeter control strategy as a backup where some soil exposure will still occur, even with the best possible erosion control (the above measures) or when there is a discharge to a sensitive water body.

vi. Specify flow control BMPs to prevent or minimize to the greatest extent technically feasible the following:

- Flow of relatively clean off site water over bare soil or potentially contaminated areas;
- Flow of relatively clean intercepted groundwater over bare soil or potentially contaminated areas;
- High velocities of flow over relatively steep and/or long slopes, in excess of what erosion control coverings can withstand; and
- Erosion of channels by concentrated flows either by using channel lining, velocity control, or both.

vii. Minimize the number of construction entrances. Specify stabilization of construction entrance and exit areas, provision of a nearby tire and chassis wash for dirty vehicles leaving the site with a wash water sediment trap, and a sweeping plan.

viii. Specify construction road stabilization.

ix. Specify wind erosion control.

x. Manage the construction site to avoid the release of pollutants other than sediments by preventing contact between rainfall or runoff and potentially polluting construction materials, processes, wastes, and vehicle and equipment fluids by such measures as enclosures, covers and containments, as well as berming to direct runoff.

APPENDIX D: Water Conservation Plan Guidance

The appropriate managing partner for the urban development shall require binding agreements for the existing project and future phases of the project, incorporate a Salmon-Safe water conservation plan to ensure that Salmon-Safe practices are maintained over time. Water conservation measures reduce irrigation water use to the minimum necessary to support maintenance of urban development grounds.

A long-term water use plan should incorporate the following performance guidelines:

i. Conservation plan—Development management follows a plan to conserve water by focusing watering in limited areas based on varying plant needs and human use objectives.

ii. Water use monitoring is conducted and annual summary reporting is available. Reporting documents a decline in water use per acre for the system over the most recent five-year period or explains how no further efficiencies are feasible.

iii. A plan is implemented that shows significant progress, where technically feasible within budgetary constraints and human use mandate, toward increased water conservation, including the following:

- Utilize water-efficient technologies within and around structures;
- Developing landscapes with native vegetation that requires less irrigation;
- Replacing outdated irrigation equipment with an efficient, modern irrigation system to adjust supply to vegetation requirements, infiltration, evapotranspiration and other factors;
- Water use plan to further limit irrigation areas to high priority sites as determined by the appropriate managing authority;
- Using rain catchment and recycled stormwater systems;
- Using soil management practices, such as composting and mulching, and thatching and aerating turf, to reduce irrigation requirements; and
- Minimizing total area of turf by converting turf areas to landscaping that requires less irrigation.

www.salmonsafe.org

SS-2019-STD-PNA6