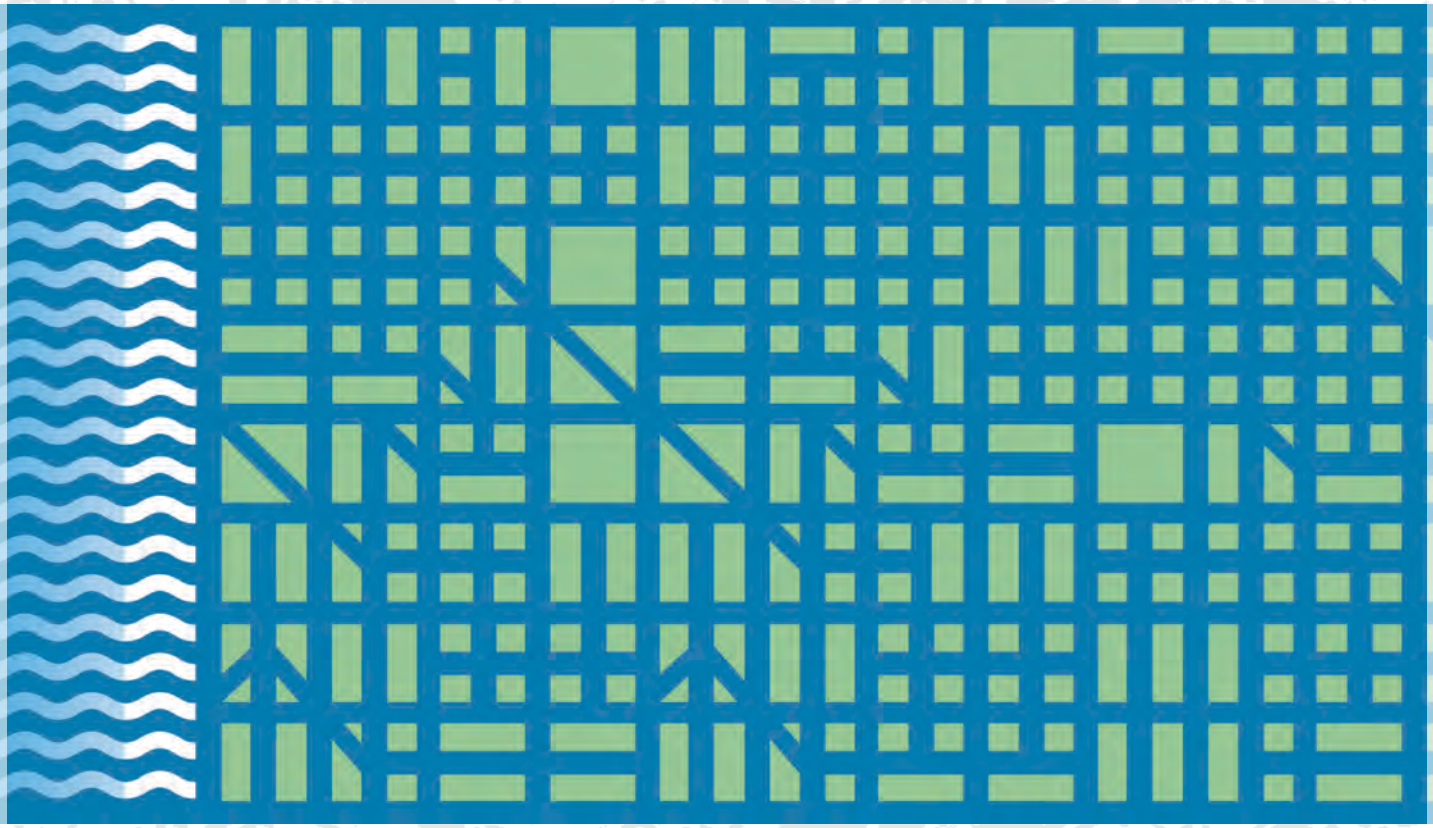
SALMON-SAFE CERTIFICATION STANDARDS FOR INFRASTRUCTURE DEVELOPMENT

Draft 1.1



Prepared for
Salmon-Safe Inc.

May 2018

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Executive Summary

The *Salmon-Safe Certification Standards for Infrastructure Development* (Infrastructure Standards) is a guide intended to improve infrastructure projects by minimizing the impacts of road, rail, water and wastewater, and energy projects on sensitive aquatic and upland resources, and by enhancing salmonid habitat.

These Infrastructure Standards are the most recent effort by Salmon-Safe to promote development at a variety of scales that emphasize landscape-level conservation and protection of biological diversity.

Program Description

Based on over a decade of work with more than 300 urban and agricultural landowners across the Pacific Northwest, Salmon-Safe brings a collaborative, peer-reviewed approach to infrastructure certification that is unique among certification programs.

Infrastructure projects differ from other categories of projects evaluated and certified by Salmon-Safe in that the planning stage is typically led by a different team than design and construction of a particular project. The Salmon-Safe Infrastructure Standards address considerations during both the planning stage (Planning Standards) and the project delivery stage (Site Standards).

The evaluation and certification process is a collaborative effort between Salmon-Safe and the planning or project delivery team. Salmon-Safe assigns an interdisciplinary evaluation team of qualified experts who work with the candidate team during each stage of planning or project delivery. The Salmon-Safe team is available for the life of the project to help navigate standards and performance requirements.

Even after a project is certified, Salmon-Safe promotes the long-term environmental performance of certified sites through an annual verification process. This process reviews maintenance and landscape management practices, habitat restoration progress, facility performance and other program elements to make sure the project is functioning as designed.

Introduction

Salmon-Safe

Salmon-Safe's infrastructure certification program is intended to promote ecologically sustainable land management that protects water quality and aquatic biodiversity. Beginning with the 2004 certification of the 10,000-acre Portland Parks system in Portland, Oregon, Salmon-Safe has successfully transitioned numerous projects to certification, including the Nike World Headquarters campus, University of Washington, Seattle Art Museum's Olympic Sculpture Park, Oregon Convention Center and other sites in Oregon and Washington.

The Salmon-Safe Infrastructure Standards constitute a set of planning guidelines and best management practices (BMPs) that can be applied across a variety of landscapes, ranging from high-level master planning processes to single-site infrastructure projects. While the Infrastructure Standards are designed as a stand-alone program, they can also complement other leading certification standards (e.g., LEED, Sustainable Sites, Envision and Earth Advantage), by certifying project activities that specifically address ecological function and the quality of habitat for fish, wildlife and people.

The Salmon-Safe certification program focuses on watershed impacts including salmonid species (i.e., salmon and trout) and their habitat requirements. Salmonid species are key indicator species in the Pacific Northwest and their conservation is entwined with the health of ecosystems that include a variety of aquatic and upland wildlife species. Therefore, this evaluation focuses on the following biological components of the ecosystem that most affect salmonids and the ways those components can be protected: (1) water quality, (2) water quantity, (3) instream habitat, (4) riparian habitat and (5) fish passage.

All of Salmon-Safe's Certification Standards receive peer review by scientists, technical experts, representatives of environmental organizations and other interested parties. Salmon-Safe may periodically review and revise its standards to reflect changes in the best available science and emerging development practices.

Infrastructure Context

Infrastructure projects must serve public needs, meet agency directives and comply with regulations within budgetary and political constraints. Many agencies have committed to reducing the environmental footprint of infrastructure projects through conservation practices, sustainable stormwater design practices, operational practices and other means. Salmon-Safe's Infrastructure Standards are focused on identifying opportunities for infrastructure projects to go even further in contributing positively to ecosystem health.

Infrastructure planning efforts and projects provide opportunities to enhance ecological corridors, protect key habitats and remove barriers to salmon recovery. For example, new infrastructure can be sited in areas that have already been disturbed by development—railways can become green corridors for pollinators and stormwater management, bridges can be located in areas with the least impact on sensitive soils, and roadways and streets can be greenways that ensure effective fish passage. Even when specific ecological habitats are not present, infrastructure projects can help protect resources, clean up pollution, restore soil health and reduce the urban heat island effect, which all have cumulative, positive effects "downstream."

Organization of Standards

Following this Introductory section, the Infrastructure Standards are presented in two main sections, supported by information provided in the appendices.

- Planning-level standards are focused on decision making that can be implemented programmatically or at the master planning level. They incorporate objectives for site selection and prioritization at a system-wide level. These could be strategies for siting projects, tracking and minimizing impacts, or improving master planning by identifying and incorporating opportunities to improve ecological function in conjunction with infrastructure projects.

- Site-level standards apply to infrastructure projects once they are in the project delivery phase. This covers standards that apply during planning, design, construction and maintenance for a specific project (and a particular site).

The Infrastructure Standards are intended to capture a wide range of infrastructure projects.

Table 1 provides a list of Infrastructure Standards and references the location of both the planning- and site-level standards within this document.

Table 1. Salmon-Safe Infrastructure Standards		
STANDARD	Planning Standard	Site Standard
I.1 Stormwater Management	I.1P	I.1S
I.2 Water/Wastewater	I.2P	I.2S
I.3 Construction Practices	I.3P	I.3S
I.4 Water Quality Protection	I.4P	I.4S
I.5 Ecological Function	I.5P	I.5S
I.6 Instream Habitat Protection and Restoration	I.6P	I.6S
I.7 Riparian/Wetland/Vegetation Protection and Restoration	I.7P	I.7S

Evaluation Process For Certification

Scope of the Evaluation Process

The evaluation process begins with an initial consultation with Salmon-Safe to determine whether the project may be eligible for Salmon-Safe certification. If Salmon-Safe confirms that the project is eligible and the project proponent is interested in moving forward, Salmon-Safe would then select an appropriate evaluation team.

Eligibility for Salmon-Safe Certification

For a site to be eligible for certification, an agency or project proponent must demonstrate commitment to doing more than the minimum required for regulatory compliance to reduce and address the impacts of the proposed infrastructure project on sensitive aquatic and natural resources.

To begin this process, the agency or owner should contact Salmon-Safe as early as possible to determine whether a proposed plan or project will be eligible for Salmon-Safe certification. Salmon-Safe will request information about the project. The objective of this preliminary screening is to determine if a proposed project is compatible with the mission and goals of Salmon-Safe and its Infrastructure Standards.

The Evaluation Team

The certification evaluation is conducted by a team of two or more qualified, independent experts hired by Salmon-Safe. The evaluation team is well versed in aquatic ecological science, infrastructure project planning and design and landscape management. Salmon-Safe will select the composition of the team for each project.

To conduct the certification evaluation for Salmon-Safe, the evaluation team conducts a detailed assessment of the overall planning and project documentation related to watershed, habitat and water quality protection. The team may also conduct a field review of habitat conditions to evaluate whether such management is consistent with Salmon-Safe's site-specific Infrastructure Standards for avoiding harm to aquatic and upland resources.

Description of Review Phases

The evaluation team assesses planning documentation, project plans, designs and maintenance practices against the Infrastructure Standards. The evaluation team uses the Infrastructure Standards and performance requirements in this document to evaluate whether the project as a whole will be awarded certification.

Salmon-Safe offers three formal opportunities for collaboration throughout the project planning and project delivery process. For maximum benefit to the project, Salmon-Safe recommends that the evaluation team participate in the process during specific review phases for both the planning- and site-level processes. The following tables provide

a summary of typical activities associated with each Salmon-Safe Review Phase and how they loosely align with typical planning and project phasing.

PLANNING LEVEL		
Phase	**Salmon-Safe Review Phase**	**Summary of Review Phase**
1	Policy Level Review	This phase offers an opportunity for certification candidates to discuss their planning process and learn about Salmon-Safe. The objective of this phase is to ensure communication about general planning practices and evaluate the suitability of an infrastructure agency or program for Salmon-Safe infrastructure certification.
2	Program Level Review	Salmon-Safe's review will vary for individual agencies, but may include: Policy and Code Development Current and future policies enhance and protect salmonid habitat, do not directly conflict with healthy watershed practices, and rely on the best available science and practices for protecting watershed health.
3	Project Prioritization Review	Salmon-Safe will review master planning documents to evaluate whether the process prioritizes and considers watershed health and resilience. Plans should reflect an analysis of watershed-level data, existing and potential natural resources and habitats.
4	Project Siting Evaluation Review	Salmon-Safe will evaluate site or corridor selection to confirm that planning-level standards have been considered.
5	Infrastructure Expansion Plan Review	Salmon-Safe will evaluate area proposed for expansion to confirm that planning-level standards have been considered.

SITE LEVEL		
Phase	**Salmon-Safe Review Phase**	**Summary of Review Phase**
1	Site Assessment and Planning	This preliminary review provides information for the design team and allows for communication about the project goals and Q&A for Salmon-Safe. Typical activities include: • site visit • review site inventory and assessment • review conceptual plans • review Salmon-Safe certification standards • issue Phase 1 recommendation for team Relevant project development phases: *project inventory and assessment, site planning, schematic/conceptual design*
2	Review of Plan Submittal	This review occurs as project specifics are developed, as the project is working to obtain the necessary permits, approvals and entitlements. Typical activities include: • review plans and documents • discuss issues and additional opportunities and constraints • issue Phase 2 recommendation for team to incorporate into final documents Relevant project development phases: *site design, permit documents, construction and bid documents*
3	Certification of Constructed Project	This provides final documentation of built or almost completed project. Typical activities include: • site visit and project review • review incorporation/implementation of Phase 1 and 2 recommendations • review all necessary documentation • final report and recommendations for certification Relevant project development phases: *project construction, punch list, final walkthrough; final completion; operations and maintenance activities and plans*

Decision Rule for Certification

Certification is awarded when the evaluation team and Salmon-Safe are satisfied that a project meets all relevant Infrastructure Standards and associated performance requirements. If the candidate infrastructure project does not fully meet the Infrastructure Standards and performance requirements, the evaluation team may conditionally certify a project, subject to one or more conditions for certification that must be completed to the satisfaction of the evaluation team prior to formalizing certification or during the five-year certification period.

Maintaining Certification

For planning-level evaluation, Salmon-Safe infrastructure project certification is valid for five years.

For site-level projects, Salmon-Safe infrastructure project certification is valid for five years, subject to annual verification of satisfactory progress in meeting any conditions to the certification. Annual verification requirements require preparation of an annual site summary report. This report typically includes a characterization of site conditions and observed performance, verification of incorporation of policies and procedures identified during certification, photo documentation of site conditions at select photo points and other reporting elements that are agreed upon at the time of certification. *The annual certification report and verification form is attached as Appendix F.*

After the five years are complete, the project may be recertified through a recertification process composed of a project site audit and assessment.

General Standards For Certification

This section outlines general standards that must be met for Salmon-Safe Infrastructure Certification. They include required conditions R that must be met prior to certification and provisional standards that can be met by providing a written agreement to comply with specific conditions stipulated by the evaluation team.

R (1) Project 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) Provisions are made for the identification and protection of rare, threatened and endangered salmonids and their habitat, if any, existing on the site.

(3) Satisfactory progress is being made in addressing design and infrastructure that directly degrade salmon habitat. Restoration efforts may include those required by the evaluation team to address deficiencies, as well as efforts already being undertaken. There is demonstrated progress in correcting management deficiencies.

(4) 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 Salmon-Safe assessment and certification.

R (5) Agency or Owner allows monitoring by a third party authorized by Salmon-Safe and fully cooperates with such monitoring in so far as possible, given staffing and funding constraints. The evaluation team may request that agencies or owners conduct monitoring to assess the efficacy of existing management practices in meeting Salmon-Safe standards.

R (6) A policy addressing new alterations or redevelopment is in place. This policy requires that the design for expansion or redevelopment of an existing project be consistent with Salmon-Safe standards, as feasible, considering human-use mandates and cost considerations.

Planning-Level Certification Standards of Infrastructure

For planning-level evaluation, the Salmon-Safe Certification Standards are intended to guide agencies and municipalities in making programmatic planning changes to reflect Salmon-Safe objectives. The standards should be incorporated at the earliest stages of infrastructure projects—for example, during master planning when projects are reviewed, prioritized, selected and sited. The planning-level standards are intended for use by agencies, planners and land managers as part of the Salmon-Safe certification process. The standards encourage project teams to consider the long-term effects of infrastructure projects on salmon and to plan for a resilient future of healthy water and salmon populations. The standards are designated with the alphanumeric prefix "I.1P" through "I.7P"; the "I" designation is used to denote standards and performance requirements associated with infrastructure projects and the "P" denotes a planning-level project.

I.1P Stormwater Management

Standard I.1P.1: Codes and policies have been reviewed to evaluate whether there are barriers to use of low-impact development stormwater management practices (e.g. restrictions on aggregating parking areas or prohibitions against pervious pavement). Codes and policies are updated to eliminate such restrictions to the maximum extent feasible.

Performance Requirements

i. Confirm that codes and policies have been reviewed and updated or that a review is planned.

Standard I.1P.2: Infrastructure master planning prioritizes alignments that preserve contiguous open space, limit encroachment on natural resources and preserve existing drainage patterns. Significant open space controlled by agency or owner that provides stormwater management function is protected from future development.

Performance Requirements

i. Provide master planning documents that demonstrate that these planning standards are met or under consideration.

Standard I.1P.3: Agency, Bureau or Owner has programs in place to ensure that stormwater management practices that prioritize infiltration are prioritized. The general hierarchy of approved stormwater management practices prioritizes total onsite treatment and infiltration as follows:

(1) Total onsite treatment and infiltration with vegetated facilities, green roof and permeable pavements;

(2) Total onsite infiltration with a combination of vegetated and pervious facilities (Level 1) with outflow to subsurface infiltration facilities (i.e., drywell);

(3) Combination of onsite Infiltration (Level 2) and treatment/detention with vegetated facilities prior to outfall;

(4) Onsite treatment/detention using vegetated facilities, green roof, permeable paving (where no infiltration is feasible) prior to outfall;

(5) Combination of onsite treatment/detention using vegetated facilities with additional treatment/detention using filters/vaults; and

(6) Treatment using filters and detention using vaults (only after evaluation of Levels 1 through 5, above).

Performance Requirements

i. Provide stormwater design guidelines that include stormwater hierarchy or other means of prioritizing these preferred stormwater management practices.

Standard I.1P.4: Agency, Bureau or Owner has an effective maintenance program in place and has adopted a programmatic maintenance plan to ensure that installed low-impact development stormwater control features are working as designed. The plan lists activities to perform, provides a schedule for activities, identifies visual and other indicators of performance problems and identifies responsible parties. Adaptive management triggers actions that respond to changes in performance.

Performance Requirements

i. Provide documentation of maintenance program and practices.

I.2P Water / Wastewater

Standard I.2P.1: Agency or Owner tracks information on sustainable water and wastewater strategies and energy and water savings and updates reporting and strategies annually.

Performance Requirements

i. Agency establishes and tracks goals for energy and water savings associated with wastewater treatment and conveyance infrastructure. Strategies may include combined heat and power (CWP) or cogeneration through use of anaerobic digesters that generate methane and can be burned in a CHP system to heat and power the facility (USEPA 2013).

Standard I.2P.2: Water and wastewater pipeline corridors and construction methods minimize impacts to streams and wetlands.

Performance Requirements

i. New corridors for water and wastewater pipelines are selected to avoid streams and wetlands.

ii. Where streams and wetlands cannot be avoided, trenchless methods such as microtunneling are used to avoid impacting streams and wetlands in the project corridor.

Standard I.2P.3: Innovative wastewater treatment processes that incorporate opportunities to enhance wetlands with reclaimed water are incorporated to the maximum extent operationally feasible.

Performance Requirements

i. Where existing or new wastewater treatment facilities are located adjacent to wetlands, projects incorporate enhancement, expansion and restoration of wetlands with Class A level reclaimed water, revegetation efforts and restoration activities to the maximum extent operationally feasible.

ii. For existing wastewater treatment plants that discharge directly or indirectly to streams and rivers, watershed planting programs are implemented along with engineered cooling to ensure that the plant provides a net reduction instream temperature.

Standard I.2P.4: Agency, Bureau or Owner has a water use and conservation plan that formalizes conservation practices, as detailed in Appendix B *(Water Conservation Plan Guidance).*

Performance Requirements

i. The plan lists activities to perform, provides a schedule for activities and identifies responsible parties. Adaptive management triggers actions that respond to changes in performance. The water conservation plan shall include a drought management plan that details how significant reductions will be achieved during a drought.

ii. This plan as a whole, or its elements therein, have been adopted into the agency or bureau's guiding documentation that formalizes the appropriate managing authority's responsibility to implement and enforce all aspects of the plan on both private property or common property managed for the public good.

I.3P Construction Practices

Standard I.3P.1: Agency or Owner has program in place to avoid or reduce short- and long-term negative stormwater impacts resulting from construction.

Performance Requirements

i. Agency or Owner offers training, staffing, prequalification requirements for contractors and other resources to ensure that infrastructure projects implement construction practices that limit soil erosion and eliminate potential sediment inputs into surface waters to the greatest extent operationally feasible. This is achieved by use of a Salmon-Safe accredited contractor or ensuring that contractors use practices consistent with accreditation requirements.

ii. Programs are in place to ensure that inspectors can confirm that visible or measurable sediment or pollutants do not exit the site or enter the public right of way.

iii. All new plans prepared for infrastructure projects meet or exceed current state requirements for site pollution control during construction.

Standard I.3P.2: Agency or Owner has manual or policy that describes erosion prevention and sediment control requirements and practices.

Performance Requirements

i. Agency or Owner has developed or references an erosion control manual with guidance on best management practices prevent and control erosion.

ii. Agency or Owner requires that an erosion and sediment control plan be developed for all infrastructure projects. See Appendix C *(Model Construction-Phase Stormwater Management Program)* for plan guidance.

iii. Vegetation protection plans are required for construction.

Standard I.3P.3: Agency or Owner implements and tracks strategies to reduce construction waste.

Performance Requirements

i. Agency establishes and tracks goals for waste diversion rates tracks the amount of construction and demolition debris diverted from landfills.

I.4P Water Quality Protection

Standard I.4P.1: Agency or Owner have policies in place restricting use of toxic deicers, surfactants and other chemicals to maintain roadways and similar infrastructure. Policies support the use of non-toxic, alternative substances for maintenance of infrastructure and methods to document chemical use for maintenance are in place. Provide documentation of policies restricting chemical use.

Performance Requirements

i. Agency or Owner provides documentation of policies, standard specifications, manual, or other guidance restricting use of toxic chemicals in accordance with this standard.

Standard I.4P.2: Agency or Owner prepares and implements an integrated pest management (IPM) plan and nutrient management plan consistent with Salmon-Safe standards as detailed in Appendix D *(IPM, Nutrient and Chemical Management Plan Guidance)* that governs use of nutrient and chemicals on all infrastructure projects.

Performance Requirements

i. IPM plans are prepared with the assistance of professionals with extensive expertise in preparing IPM plans and in managing landscapes using IPM practices.

ii. The plans as a whole, or their elements therein, have been adopted into the organization's guiding documentation that formalizes the appropriate responsibility to implement and enforce all aspects of the plans.

Standard I.4P.3: Agency or Owner require landscape and property management contractors to demonstrate previous knowledge, experience and skills preparing and implementing integrated pest management plans (IPM). Priority is given to contractors who limit use of hazardous chemicals and manage sites for long-term ecosystem health.

Performance Requirements

i. Documentation of contractor training and pre-qualifications is provided.

I.5P Ecological Function

Standard I.5P.1: Agency or Owner has identified key indicator species and habitat and planning efforts include protection of habitat and preservation of habitat connectivity.

Performance Requirements

i. Agency or Owner has performed landscape scale mapping and analysis of land owned by entity to evaluate habitat patches and corridors within the local region (sites, buildings, roofs, open space and site) as a tool for maximizing the connectivity between habitats at multiple sites and to larger core habitat zones beyond the immediate project area.

ii. Agency or Owner has performed survey of existing species of birds, mammals, insects and invertebrate composition within the region and onsite to aid in setting goals for successful establishment (e.g., types, numbers, distribution) of key indicator species.

iii. Agency or Owner is working with neighboring jurisdictions and property owners in the region to identify opportunities to expand habitat corridors and maximize connectivity.

iv. Agency or Owner has policies in place to evaluate building materials used in infrastructure projects to ensure that they do not endanger or pose a threat to wildlife (e.g., building façade requirements should be designed to avoid bird kills; toxic building and landscape materials that pose a threat to wildlife should be restricted, etc.).

I.6P Instream Habitat Protection and Restoration

Standard I.6P.1: Existing watershed-specific restoration or recovery plans for streams within the jurisdiction of the agency have been reviewed. Opportunities to incorporate objectives of these plans and programs into infrastructure planning decisions have been identified.

Performance Requirements

i. Agency or Owner has reviewed watershed-specific restoration or recovery plans for streams within the agency's jurisdiction.

ii. Planning efforts incorporate opportunities to address restoration opportunities identified in watershed restoration and recovery plans, where infrastructure projects are planned.

iii. Agency or Owner is partners with neighboring jurisdictions, watershed councils and other non-profits to improve watersheds.

I.7P Riparian/Wetland/Vegetation Protection and Restoration

Standard I.7P.1: P Master planning prioritizes protection of riparian buffers, wetlands and significant vegetation.

Performance Requirements

i. Local wetland and riparian habitats have been characterized by type, quality and condition.

ii. Significant vegetation and sensitive habitats that are not associated with riparian and wetland areas have been inventoried and mapped by a qualified biologist or in consultation with a local or state fish and wildlife agency. These areas are protected and avoided during infrastructure projects.

Standard I.7P.2: P Riparian habitat is mapped, maintained, restored and unimpeded by structures or improvements.

Performance Requirements

i. Projects near riparian areas are avoided to the greatest extent operationally feasible. Specifically, for streams identified as either (1) fish-bearing, (2) potentially fish-bearing, or (3) non-fishbearing with a defined channel connected to a fish-bearing or potential fish-bearing stream, impacts on riparian functions affecting water quality, water quantity, floodplain condition, stream shading and contiguous riparian canopy connectivity shall be minimized within 200 feet of a stream or river channel migration

zone or within the riparian protection areas cited in adopted local, regional or state plans, whichever distance is larger. If 100% avoidance of impacts to these riparian functions is not possible, the effect on riparian buffers is minimized and mitigated to offset the functional impacts.

ii. Plans maximize the protection and enhancement of connectivity between riparian, wetland and upland habitats to the greatest extent operationally feasible. Life histories of identified and local species are maintained by connecting riparian, wetland and upland habitats in a manner that supports habitat needs. Impediments to habitat connectivity, including fencing, buildings or other barriers are planned for removal or avoided.[1]

iii. Plans minimize infrastructure projects within 100-year floodplain areas to the greatest extent operationally feasible. If impacts are unavoidable, floodplain volume mitigation requirements are met onsite. Planning considerations require providing additional floodplain storage should there be room available onsite.

Standard I.7P.3: **P** Impacts to wetlands are avoided to the greatest extent feasible. If wetland impacts cannot be avoided, they are, in order of preference, protected, restored or recreated. Master plans, code and policies strive to provide off-channel salmonid habitat, improved water quality, additional floodplain storage and/or other habitat benefits associated with proper wetland function.

Performance Requirements

i. Degraded wetlands with opportunities for enhancement are identified, mapped and incorporated into long-term restoration strategies in order to create or restore wetland and floodplain habitat, off-channel habitat and/or other wetland functions (e.g., habitat quality or water storage and infiltration).

ii. Development near wetlands is avoided to the greatest extent operationally feasible. Impacts on wetland functions affecting water quality, water quantity, floodplain condition and contiguous habitat connectivity are minimized within 100 feet of a wetland or within the buffer protection areas cited in adopted local, regional or state plans, whichever distance is larger. If 100% avoidance of impacts to these wetland functions is not possible, the effect on wetlands and wetland buffers is minimized and mitigated to offset functional impacts.

iii. Where existing wetland buffers are degraded, buffers are restored by revegetation or removal of existing detrimental structures or impervious

[1]Work with a qualified biologist or a local or state fish and wildlife agency to identify significant local species and their habitat requirements.

surfaces. Buffers are managed to respond to needs of known local wetland fauna that require accessible adjacent or nearby upland habitat during their life histories.

iv. Wetland habitats and their buffers are spatially connected by locally appropriate, contiguous native vegetation to the greatest extent operationally feasible. These areas are also connected to other natural areas as part of a landscape-scale, conservation framework.

v. Riparian buffers are protected in perpetuity by conservation easements or other measures.

Site-Level Certification Standards of Infrastructure

Each site-level standard falls within one of seven management categories that cover a set of considerations important for conserving salmonid and upland habitat and for promoting the protection and enhancement of urban ecology. The standards are designated with the alphanumeric prefix "I.1S" through "I.7S"; the "I" designation is used to denote standards and performance requirements associated with infrastructure projects and the "S" denotes a site-level project. As described below, symbols next to a particular performance requirement indicate specific requirements for a specific project type.

I.1S Stormwater Management

For infrastructure projects, thoughtful attention to stormwater management is an important area where the impacts of infrastructure projects on salmonid habitat can be reduced. At a minimum, and to meet the general standards for certification, every infrastructure project must meet local, state, federal and other applicable regulations related to stormwater management. However, a Salmon-Safe project should go beyond minimum regulatory requirements and use creative and thoughtful approaches to benefit urban ecology and salmonid habitat through stormwater management practices. Replacing a predominantly impervious site with one that includes infiltration and vegetated stormwater facilities can improve the water quality and habitat of receiving waters.

Standard I.1S.1: Existing site improvements related to stormwater management have been inventoried.

Performance Requirements

i. Information on existing stormwater infrastructure, if any, has been collected from record drawings, site mapping or field visits. This includes locations of stormwater conveyance channels, pipes, catch basins, outlets and low-impact development stormwater facilities.

ii. Existing improvements contributing to stormwater runoff, including impervious and semi-pervious surfaces (e.g., gravel or pavers), are mapped.

iii. Site topography has been mapped and a drainage area assessment conducted. This information shows major stormwater catchments and locations of receiving stormwater drains or streams, if present.

iv. Areas suitable for low-impact development stormwater facilities based in part on soil infiltration capacity have been mapped.

Standard I.1S.2: An offsite drainage analysis has been conducted.

Performance Requirements

i. Any known or potential offsite drainage or stormwater resources entering the site from an adjacent property have been identified based on drainage or topographic maps or site visits. Offsite areas contributing to onsite hydrology have been characterized in terms of impervious and pervious area, any water quality concerns they may pose and any proposed changes in offsite conditions that may affect stormwater flow or water quality onsite.

Standard I.1S.3: Site layout responds to site conditions in a way that conserves contiguous existing vegetation, preserves undisturbed areas and minimizes stormwater runoff.

Performance Requirements

i. Noninvasive vegetation and soils are left undisturbed to the greatest extent operationally feasible. Disturbed locations are selected over undisturbed locations for infrastructure improvements. Locally significant patches of onsite native vegetation identified during the site inventory are left undisturbed. To the greatest extent operationally feasible, these patches of existing vegetation are spatially connected to other habitat elements via appropriate, native vegetation as a functioning conservation framework.

ii. Lots and buildings are clustered to the greatest extent operationally feasible to reduce sizes of building footprints, resulting in conservation of identified habitat areas and other open space, trees, other vegetation and soils, as well as greater overall infiltration of precipitation. Minimizing soil excavation and compaction and vegetation disturbance; Minimizing impervious rooftops and building footprints; Constructing streets, driveways, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety, bicycle transit and a walkable environment for pedestrians are not compromised; Parking areas are deliberately aggregated and are limited to the minimum number of required spaces required by code to minimize footprint.

iii. Infrastructure alignments maximize contiguous open space and limit encroachment on natural resources.

Standard I.1S.4: Stormwater management facilities are selected in accordance with the stormwater management hierarchy described in Infrastructure Planning Standards.

Performance Requirements

i. Document evaluation of stormwater hierarchy Options i through vi.

Standard I.1S.5: Infrastructure deliberately minimizes the footprint of impervious area and associated stormwater runoff.

Performance Requirements

i. Site designs minimize impervious areas. 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.

ii. Designs utilize permeable paving materials to the greatest extent operationally feasible.

iii. To the greatest extent operationally feasible, rooftop runoff is treated onsite and dispersed or infiltrated rather than concentrated. Existing downspouts are disconnected and treated to the greatest extent operationally feasible.

iv. Roadbeds and utility lines are designed to avoid or limit impact on subsurface water flow.

v. Site design of railways and trails complement, protect and enhance adjacent existing native vegetation communities to facilitate stormwater interception and natural drainage.

vi. 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 are expressly avoided.

Standard I.1S.6: Stormwater facility design results in water quality and flow control benefits.

Performance Requirements

i. Stormwater facilities are designed with adequate bypass/overflow measures to avoid the risk of catastrophic failure during high-flow events.

ii. Stormwater management systems for impervious areas, such as roadways, parking lots and buildings, treat stormwater runoff close to the source and use dispersion and infiltration rather than flow concentration and retention/detention. Examples of system components include rain gardens, vegetated swales; vegetated filter strips; infiltration trenches; roof rainwater collection cisterns; and vegetated rooftops.

iii. To the extent that low-impact site design cannot prevent the generation of stormwater runoff containing pollutants, effective measures are used to reduce contaminants in stormwater discharging from a site by methods such as conventional infiltration, constructed wetlands, wet ponds, extended-detention basins, biofiltration swales and filter strips, and filtration by sand or other media.

iv. To the extent that low-impact site design alternatives cannot prevent the generation of peak flow rates and volumes of stormwater runoff greater than in an pre-developed condition, the project implements effective measures to slow runoff originating from all primary drainage areas on the project site through conventional infiltration, detention or other means.

v. For sites with existing infrastructure, an analysis is performed to identify and assess opportunities to retrofit existing stormwater drainage systems to manage runoff per these performance requirements.

Standard I.1S.7: Stormwater facilities and infiltration features are fully integrated with habitat-based site features.

Performance Requirements

i. Stormwater facilities are planted with native and adapted vegetation adapted to the fluctuating water conditions characteristic of stormwater facilities.

ii. 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.

iii. Where consistent with the needs of local species, stormwater facilities incorporate habitat feature (such as logs, snags and varying pool depths), integrate with the surrounding habitat and vegetation and support connectivity between nearby habitats.

iv. Significant open space that has been designed to manage stormwater is protected from future development by a perpetual conservation easement or other means.

Standard I.1S.8: Construction practices avoid or reduce short- and long-term negative stormwater impacts resulting from construction.

Performance Requirements

i. Construction practices eliminate stormwater runoff and sediment transport into surface waters during construction. A construction-phase stormwater management plan is used onsite. See Appendix C (*Model Construction-Phase Stormwater Management Program*) for plan guidance.

ii. Vegetation disturbance, soil excavation and compaction are avoided or minimized to the greatest extent technically feasible during construction.

iii. LID facilities are fully protected from soil compaction and receiving sediment during construction.

Standard I.1S.9: The Agency or Owner has adopted a long-term stormwater management plan as a concise written document to formalize the existing low-impact development practices.

Performance Requirements

i. The plan provides a post-construction maintenance plan to ensure that installed low-impact development stormwater control features are working as designed. The plan lists activities to perform, provides a schedule for activities, identifies visual and other indicators of performance problems and identifies responsible parties. Adaptive management triggers actions that respond to changes in performance.

ii. The plan guides the design and construction of any future improvements, infill development or new phases of development so that they comply with the Salmon-Safe Certification Standards defined in this document. The plan identifies areas with soils with high infiltration rates appropriate for future low-impact development stormwater BMPs that should be protected to the greatest extent operationally feasible during construction of future improvements.

I.2S Water / Wastewater

Traditional water demands associated with infrastructure projects include wastewater systems, stormwater conveyance networks, potable water systems, and site infrastructure, such as irrigation. Salmonids can benefit from the thoughtful separation and sensitive treatment of water infrastructure. Salmon also benefit from the reduction of potable water use preserving higher summer instream flows. Reducing the amount of wastewater generated onsite can also have important water quality benefits by reducing water, chemical and power demands associated with wastewater treatment.

Standard I.2S.1: An existing site water infrastructure inventory as it relates to water use and disposal has been completed.

Performance Requirements

i. Availability of public water sources has been investigated to aid in avoiding the use of surface water rights, to the greatest extent operationally feasible. Information on existing sanitary/wastewater infrastructure, if any, has been collected from record drawings, site mapping or field visits.

ii. Local jurisdictional code as it relates to reuse of graywater and treated wastewater (black water) has been reviewed and documented, for reference during later stages of planning and design.

Standard I.2S.2: Surface water withdrawals are avoided and alternative water resources used, to the greatest extent operationally feasible. To the extent operationally feasible and as permissible by building codes and other regulations, reduction, reuse, treatment and recycling, and treatment and reclamation are incorporated into water use according to the following hierarchy:

→ Reduction

Avoid water consumption and increase water conservation in site and building uses. Water-efficient plumbing and building components should be used in the design and construction of new or retrofitted structures (e.g. water-efficient toilets, faucets, laundry, showers and heating and cooling systems).

→ Reuse

Capture, store and reuse 'clean' roof runoff without treatment for toilet flushing, irrigation and wash down.

→ Treatment and recycling

Capture, store and reuse runoff and graywater for irrigation and toilet flushing after treatment.

→ Treatment & Reclamation

Capture, store and reuse graywater and rainwater for potable uses after extensive treatment.

→ Potable Use

Use potable sources (only after evaluation on feasibility of options i-iv, above).

Performance Requirements

i. Document evaluation of each of the options in the water use management hierarchy.

Standard I.2S.3: Opportunities for stormwater harvest, water reuse and wastewater reclamation under local codes have been investigated during the site inventory and assessment and are employed to the greatest extent operationally feasible.

Performance Requirements

i. Confirm that opportunities to incorporate these features have been investigated. Identify any stormwater harvest, water reuse and wastewater reclamation features included in the project.

Standard I.2S.4: Landscape vegetation has been selected and located appropriate to site conditions to limit water demand.

Performance Requirements

i. Drought-tolerant and native plants that require minimal (if any) irrigation are used in landscaping. Plants with high water demands have been avoided. Where suitable, drought-tolerant native vegetation is selected over non-native plants, especially near habitat buffers. No invasive species, as defined by local and state agency weed lists, are used.

ii. Open lawn is minimized to the greatest extent operationally feasible or is composed of drought-tolerant alternative seed mixes.

iii. Construction details specify the use of suitable compost and mulch during installation to reduce irrigation requirements.

Standard I.2S.5: Water conservation practices are used during site maintenance.

Performance Requirements

i. Modern drip irrigation, automated soil moisture sensors and other water-conserving techniques are part of the irrigation plan. Irrigation delivers water based on specific vegetation requirements, rate of infiltration, evapotranspiration and other factors. Temporary irrigation systems are used for landscape vegetation that typically require water only during establishment periods.

ii. Stormwater reuse and gray water reuse systems, if compatible with code and regulatory requirements, are used. Water may be reused within building water systems, irrigation or any water use that reduces consumption.

iii. For existing developments, an analysis is performed to identify and assess opportunities to retrofit existing water systems. A report is submitted to Salmon-Safe within one year presenting a plan and schedule for implementing technically feasible water conservation projects.

Standard I.2S.6: Equipment cleaning occurs offsite or sufficiently away from riparian and wetland resources or their buffers to avoid accidental runoff, contamination or other impacts on water and natural resources.

Standard I.2S.7: No surface water withdrawals are made in association with site construction activities.

I.3S Construction Practices

Construction practices that do not adequately stabilize and protect soils can adversely impact salmonids and other species by exposing soils, subjecting them to erosion and allowing sediment to enter streams and other water bodies during storm events. Effective erosion prevention and sediment control relies on an understanding of sensitive areas within a site, e.g., unstable or highly erodible soils. Site planning and development should respond to existing terrain and soils and construction practices should integrate and maintain effective erosion and sediment control measures.

Standard I.3S.1: Soil characteristics have been mapped.

Performance Requirements

i. Soil characteristics to be mapped include but are not limited to soil types, presence of hydric soils, infiltration rates and erosion factors.

ii. Unstable or highly erodible areas, as well as existing erosion and sedimentation problem areas, have been identified and mapped. These include existing slumps or failures, steep slopes and unstable soils.

iii. Any onsite soil tests or geotechnical bores have been made and are available to the project team early in the process.

Standard I.3S.2: Site development responds to site conditions in a way that minimizes ground disturbance, erosion and sediment transport.

Performance Requirements

i. Site development responds to existing terrain to minimize excavation, grading and soil disturbance. Disturbed site locations are selected for projects over undisturbed locations.

ii. Infrastructure on slopes, if any, is on soils and grades that are stable and will not pose long-term erosion or stability issues. Erosion prevention is emphasized over sediment control.

iii. Utilities, including telephone lines, cable, water and sewage, are grouped to the greatest extent operationally feasible to minimize ground disturbance.

iv. Trail systems, rail corridors and roadways are sited sufficiently distant from riparian areas, wetlands and steep slopes such that they are not an obvious source of sediment, chemical pollution or bank instability.

Standard I.3S.3: Soil is protected from erosion and generation of sediment that could enter surface water bodies.

Performance Requirements

i. Bare or exposed soils are temporary features only, to be vegetated with drought-tolerant or native plant types. Erosion control blankets, mulch and/or tackifiers are used to prevent erosion. Erosion control seed mixes are composed of native species or other suitable species that contribute to soil stability and soil quality.

ii. Site improvements, including buildings, roads, bridges or other features, are protected by BMPs as necessary to prevent erosion. Earthen trails, especially those in designated buffers, are protected by mulch, water bars, closures or other BMPs as necessary to prevent erosion.

iii. Permanent erosion control features, in the form of site grading, flow control and landscaping, are strategically placed to prevent turbid stormwater from leaving the site.

Standard I.3S.4: Construction practices limit soil erosion and eliminate potential sediment inputs into surface waters to the greatest extent operationally feasible.

Performance Requirements

i. Construction is conducted by Salmon-Safe accredited contractor or construction pollution prevention practices are consistent with Salmon-Safe accreditation with measurable sediment or pollutants not exiting the site or entering the public right of way.

ii. 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.

iii. All new plans meet or exceed current state requirements for site pollution control during construction.

I.4S Water Quality Protection

Certain chemicals and pesticides are serious threats to salmonids and other aquatic life. They kill fish or cause sub-lethal impacts that stress juveniles, alter swimming ability and cause other behavioral changes that make salmonids more vulnerable to predation and otherwise reduce survival rate. Similar affects can result from other chemicals used for infrastructure construction or maintenance. Fecal coliform and bacteria associated with onsite sanitary systems or animals can introduce other water quality impacts that adversely affect salmonids and other species.

Standard I.4S.1: Sensitive areas are protected from animal waste.

Performance Requirements

i. Public education programs, signage and pickup stations promote proper waste disposal.

Standard I.4S.2: Sanitary systems project water quality, streams and wetlands.

Performance Requirements

i. Sanitary systems are sited outside of wetland and riparian buffers areas, in such a way to avoid contaminant risk to surface water and groundwater resources.

ii. Sanitary systems are in full compliance with all standards applied to such systems by state and local jurisdictions.

Standard I.4S.3: Landscape vegetation includes either native plants or hardy non-native plants requiring minimal chemical application, if any.

Performance Requirements

i. Areas that may require chemical use are planted outside of wetland and riparian buffer zones and are placed in such a way to minimize risk of chemicals leaving the site.

ii. Landscape plans require minimal chemical and nutrient use, if any. Plants with known susceptibility to disease, or those that require high nutrient or chemical inputs to survive in existing soils, are avoided. No plants shall be used that require application of any chemical on Salmon-Safe's *High-Hazard Pesticide List* (Appendix E) unless written documentation is provided in advance to Salmon-Safe 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) does not represent a risk to water quality and fish habitat. Plants identified on local or regional invasive plant lists are not used.

iii. For existing infrastructure, an analysis is performed to identify and assess opportunities to enhance or replace existing landscape vegetation per these performance requirements.

Standard I.4S.4: Construction practices protect sensitive areas.

Performance Requirements

i. The staging area for the project is located outside of any designated riparian, wetland or other buffer for storage and maintenance of equipment, vehicles,

chemicals or other materials that could reasonably pose a risk to sensitive aquatic habitats.

ii. An equipment and vehicle cleaning, fueling and maintenance plan is used during construction to limit the import and export of invasive plant seeds, petroleum or other toxic substances to and from the site.

iii. High-risk areas are identified and mapped (e.g., areas with surface water connection to stream, wetland or other sensitive water body; areas on steep slopes or unstable soils).

iv. Potential locations for temporary storage of chemicals during construction that avoid high-risk areas have been identified.

Standard I.4S.5: Chemical use is restricted.

Performance Requirements

i. Use of herbicides, pesticides or other chemicals is expressly avoided to the greatest extent operationally feasible, especially within riparian and wetland buffer areas.

ii. Use of toxic deicers, surfactants and other chemicals used to maintain roadways and similar infrastructure is avoided where feasible. An attempt to find non-toxic, alternative substances for maintenance should be documented and the least toxic acceptable substances used.

iii. Mechanical removal of invasive plants is chosen over chemical treatment to the greatest extent operationally feasible.

iv. No herbicides or pesticides listed in the *Salmon-Safe High-Hazard Pesticide List* (Appendix E) are used under any circumstance.

Standard I.4S.6: The Agency or Owner prepares and implements an integrated pest management (IPM) plan and nutrient management plan consistent with Salmon-Safe standards as detailed in Appendix D *(IPM, Nutrient and Chemical Management Plan Guidance).*

Performance Requirements

i. The plans are prepared with the assistance of professionals with extensive expertise in preparing IPM plans and in managing landscapes using IPM practices.

ii. The plans as a whole, or their elements therein, have been adopted into the project's guiding documentation that formalizes the appropriate managing authority's responsibility to implement and enforce all aspects of the plans on both private property and common property managed for the public good.

iii. Contractor landscaping on publicly managed property, as well as any landscaping practices on privately managed property, shall be consistent with the IPM and nutrient management plans. Contractors must provide records and documentation to the homeowners association or other appropriate managing authority that their activities are consistent with the plans. The IPM recordkeeping system shall include notes on pest monitoring, all IPM methods used and evaluation of effectiveness. The managing authority shall ensure that property owner and contractor use of herbicides, pesticides or fertilizers is consistent with Salmon-Safe standards as defined in the plans.

I.5S Ecological Function

Urban settings can host a surprising array of wildlife, including birds, bats and pollinators that can have ecological benefits far beyond the immediate site. Designing and developing urban and rural sites to provide quality habitat, promote ecological corridors where feasible and protect wildlife helps to promote Salmon-Safe's overarching goal to improve ecological systems.

Standard I.5S.1: Provide landscape scale mapping and analysis of habitat patches and corridors within the local region (sites, buildings, roofs, open space and site) and maximize the connectivity between habitats at multiple sites and to larger core habitat zones beyond the immediate project area.

Performance Requirements

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

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

iii. Work with local jurisdictions and other property owners in the region to create larger parcels (two or more buildings with similar habitat functions adjacent) or corridors (more expansive and connected terrestrial and canopy coverage in right-of-way and through sites).

Standard I.5S.2: Using the analysis conducted in the previous standards, develop site strategies for creation and retention of habitat and landscape patches that provide for food, forage and refuge for key indicator species.

Performance Requirements

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

ii. Use street tree, shrub and groundcover species that provide biological diversity and consistent food, forage and refuge for urban species.

iii. Extend street planters and larger bulb-outs at corners to maximize street landscape coverage and diversity and incorporate with stormwater facilities to provide intermittent water, mud and nesting materials.

iv. Reduce turf areas and strategically integrate a range of large patches of green roof with specific habitat elements into designs, such as woody debris, gravel/cobble and other elements typically not found in urban settings.

Standard I.5S.3: Minimize the impacts of infrastructure projects on wildlife.

Performance Requirements

i. Ensure that building materials and lighting do not endanger or pose a threat to wildlife. Use netting or screening on building facades to reflect glare on windows and prevent bird kills. Incorporate living walls and infrastructure that increases the habitat value of the site to the maximum extent operationally feasible. Avoid hazardous or toxic building and landscape materials that pose a threat to wildlife.

ii. Improve the existing environmental condition of sites prior to and during construction through restoration and retrofitting. Look at opportunities for temporary improvements to vacant or underutilized sites with low-cost plantings that have the potential to provide habitat value.

iii. 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.

iv. Site wind turbines outside of major flyways. Reduce bird and bat kills by utilizing color variety, ultrasonic acoustics or other bird and bat deterrents and warnings to the maximum extent feasible.

I.6S Instream Habitat Protection and Restoration

Standard I.6S.1: S A desktop analysis for site inventory and planning adequately characterizes existing site conditions and uses existing available data to assess habitat quality conditions for salmonids and other sensitive species.

Performance Requirements

i. Projects are compatible with existing watershed-specific restoration or recovery plans and local salmonid recovery programs.

ii. Physical and biotic watershed conditions have been investigated using available data, existing information sources and/or expert interviews.

iii. Data on historic, current or potential fish presence within the watershed system have been reviewed (if available). Based on available data, stream types in the system have been classified as either: (1) fish-bearing, (2) potentially fish-bearing, (3) non-fishbearing with a defined channel connected to a fish-bearing or potential fish-bearing stream or (4) none of the above. If no fish are currently present, historic fish presence/absence in the system has been estimated using available data and information sources.

Standard I.6S.2: A field investigation is conducted to supplement site inventory data that characterizes riparian and aquatic habitat conditions onsite and investigates the likelihood that fish may be present.

Performance Requirements

i. Onsite stream channel deficiencies have been identified. Bank stability and channel incision have been characterized across the site. Onsite 100-year floodplain and channel migration zones have been mapped.

ii. If necessary, fish surveys are conducted to verify presence or absence of fish species.

iii. Onsite streams and rivers classified as either (1) fish-bearing, (2) potentially fish-bearing, or (3) non-fishbearing with a defined channel connected to a fish-bearing or potentially fish-bearing stream, significant aquatic habitat features (riffles, pools, runs, large wood, etc.) are identified and mapped within the parcel.

iv. Onsite stream crossings have been inventoried and evaluated to determine priorities for fish and wildlife passage and flood conveyance.

Standard I.6S.3: The site plan details locations for instream enhancements, barrier removal, methods for avoiding impacts to instream areas and potential mitigation measures based on the results of the site inventory.

Performance Requirements

i. Plans protect existing channels 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.

ii. Where impacts on streams are unavoidable, mitigation strategies that include site improvements to offset physical and biological disturbance are shown. Bioengineering methods are used to the greatest extent operationally feasible to repair incised or eroded stream banks.

iii. Where geomorphically appropriate, stream banks are stabilized by native vegetation where suitable.

iv. Infrastructure, buildings and other site improvements, including areas of compacted fill, are placed outside the floodplain and channel migration zone.

v. Utility lines on stream crossings are placed on bridge crossings in serviceable locations, rather than buried.

vi. At a minimum, the site plan protects existing channels 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.

vii. The number of stream crossings has been reduced (where existing crossings are present) or minimized (when new crossings are needed). Placement of crossings is accompanied by rehabilitation of riparian habitat and reduction of water quality impacts where applicable.

Standard I.6S.4: Construction practices ensure fish and wildlife exclusion/protection measures are in place near water bodies.

Performance Requirements

i. Work area isolation barriers such as cofferdams, silt curtains or other devices are used at all times to ensure work below the ordinary high water line does not harm or entrap fish.

ii. Applicants coordinate with agencies to perform in-water work only when permitted.

iii. A fisheries biologist or equivalent qualified specialist is available onsite during in-water construction in the event of accidental fish entrapment.

Standard I.6S.5: Post-construction evaluations and maintenance (O&M) verify that channel and instream habitat is functioning on the property. Key deficiencies identified during site analysis have been addressed and resolved.

Performance Requirements

i. Unnatural barriers to fish and wildlife, water, sediment and large woody debris movement have been removed or plans are in place for removal.

ii. Existing levees have been removed/moved and floodplains restored to the greatest extent operationally feasible, and no new levees are proposed.

iii. Artificial ponds located in stream channels are either removed or are reconstructed as needed to provide adequate fish passage and habitat, and to maintain stream temperatures and oxygen levels within applicable state water quality standards.

iv. Stream crossings avoid obstructions and encumbrances to fish, wildlife, large wood and sediment passage to the greatest extent operationally feasible.

v. Operations and maintenance plans list activities to perform, provide a schedule and identify responsible parties. Adaptive management triggers actions that respond to changes in performance.

vi. This plan as a whole, or its elements therein, have been adopted into the project's guiding documentation that formalizes the appropriate managing authority's responsibility to implement and enforce all aspects of the plan on both private property or common property managed for the public good.

I.7S Riparian/Wetland/Vegetation Protection and Restoration

Standard I.7S.1: A desktop analysis for site inventory and planning looks at existing data on wetland, riparian and significant vegetation areas to characterize existing site conditions and habitat quality.

Performance Requirements

i. Information available on sensitive habitat, significant habitat protection zones, locally sensitive, threatened and endangered species and other such similar information is reviewed and mapped as it relates to the site.

Standard I.7S.2: A field investigation is conducted by a biologist, ecologist, wetland scientist or other qualified professional to supplement missing information needed to characterize wetland, riparian and significant vegetation areas onsite.

Performance Requirements

i. Local and watershed riparian habitat extent, quality and conditions have been characterized by species composition and estimated percent cover in the tree canopy, shrub layer and herbaceous layer, especially in areas adjacent to, immediately upstream or immediately downstream of the site.

ii. All onsite riparian areas are identified, mapped and described by width of existing buffer and stream length of riparian vegetation free from intrusions from roads, utilities and other clearings (i.e., riparian continuity). Particular note has been made of presence and extent of invasive plant populations. Damaged, exposed or at-risk areas, as well as locations of invasive species, have been identified and mapped to identify degraded riparian areas in need of restoration.

iii. A site inventory of common local terrestrial riparian species (vegetation, birds, mammals, reptiles and amphibians), game trails or other signs of use by wildlife has been conducted at least once during the breeding or growing season to determine or estimate presence/absence of species onsite. Locations identified in the survey that likely provide significant habitat value and/or may harbor sensitive species that may be impacted by nearby construction disturbance, particularly during the breeding/nesting season, have been mapped.

iv. A wetland inventory has been conducted by a wetland scientist or other qualified professional that adequately characterizes wetland habitat conditions onsite and in the local geographical area. Existing onsite wetlands are identified, classified and mapped. Classification of existing wetlands includes types of impacts and whether the wetland historically or currently provides fish habitat.

v. Wetland hydroperiods have been estimated and hydrologic pathways have been determined to the greatest extent operationally feasible. Existing wetland functions and deficits have been characterized. Damaged, exposed or at-risk areas have been identified and mapped to identify degraded wetland areas in need of restoration.

vi. Patches of locally significant vegetation and sensitive habitats that are not associated with riparian and wetland areas have been inventoried and mapped by a qualified biologist or in consultation with a local or state fish and wildlife agency. Tree species, diameter at breast height distribution, canopy cover, understory conditions and limits of contiguous canopy cover are noted.

Standard I.7S.3: Site plans demonstrate that impacts to wetlands and riparian areas are avoided to the greatest extent feasible. If wetland and riparian area impacts cannot be avoided, they are, in order of preference, protected, restored or recreated. The site plan strives to provide off-channel salmonid habitat, improved water quality, additional floodplain storage and/or other habitat benefits associated with proper wetland function.

Performance Requirements

i. Degraded wetlands are restored or new wetlands created to improve floodplain habitat, off-channel habitat and/or other wetland functions (e.g., habitat quality or water storage and infiltration) to the greatest extent operationally feasible.

ii. Infrastructure near wetlands is avoided to the greatest extent operationally feasible. Specifically, impacts on wetland functions affecting water quality, water quantity, floodplain condition and contiguous habitat connectivity shall be minimized within 100 feet of a wetland or within the buffer protection areas cited in adopted local, regional or state plans, whichever distance is larger. If 100% avoidance of impacts to these wetland functions is not possible, the effect on wetlands and wetland buffers is minimized and mitigated to offset functional impacts.

iii. Where existing wetland buffers are degraded, buffers are restored by revegetation or removal of existing detrimental structures or impervious surfaces. Buffers are managed to respond to needs of known local wetland fauna that require accessible adjacent or nearby upland habitat during their life histories.

iv. Wetland habitats and their buffers are spatially connected by locally appropriate, contiguous native vegetation, to the greatest extent operationally feasible. These areas are also connected to other natural areas as part of a landscape-scale, conservation framework.

v. Infrastructure near riparian areas is avoided to the greatest extent operationally feasible. Specifically, for streams identified as either (1) fish-bearing, (2) potentially fish-bearing, or (3) non-fishbearing with a defined channel connected to a fish-bearing or potential fish-bearing stream, impacts on riparian functions affecting water quality, water quantity, floodplain condition, stream shading and contiguous riparian canopy connectivity shall be minimized within 200 feet of a stream or river channel migration zone, or within the riparian protection areas cited in adopted local, regional or state plans, whichever distance is larger. If 100% avoidance of impacts to these riparian functions is not possible, the effect on riparian buffers is minimized and mitigated to offset the functional impacts.

vi. Connectivity between riparian, wetland and upland habitats is maximized to the greatest extent operationally feasible. Life histories of identified local

species are maintained by connecting riparian, wetland and upland habitats in a manner that supports habitat needs. Impediments to habitat connectivity, including fencing, buildings or other barriers, are avoided.

vii. 100-year floodplain areas are avoided and not filled, to the greatest extent operationally feasible. If impacts are unavoidable, floodplain volume mitigation requirements are met onsite. Considerations are made for providing additional floodplain storage should there be room available onsite.

Standard I.7S.4: Sensitive natural resources are protected during construction.

Performance Requirements

i. Intensive construction activities with the potential to disturb sensitive wildlife occur outside the height of the terrestrial breeding season (typically May–July) to the greatest extent operationally feasible. This applies in particular to construction in or near locally significant habitats, known nesting locations and designated surface water buffer zones.

ii. A tree protection plan has been developed with the aid of a certified arborist for use during construction. In addition to site-specific tree protection provisions, this plan should adhere to the following requirements:

- Project work limits are clearly defined by a temporary construction fence to protect tree drip lines and vegetation not-to-be disturbed.
- Riparian areas, wetland areas, identified locally significant vegetation and their corresponding buffers are marked and protected from construction encroachment through the use of construction fence and signage.
- Pre-construction meetings are held onsite so that contractors understand project work limits and other construction restrictions.

iii. Where necessary, disturbed native plants, woody substrate and soils are salvaged and reused onsite to the greatest extent operationally feasible.

Standard I.7S.5: Post-construction inspections verify that wetlands and riparian zones and their buffers are operating in a properly functioning condition.

Performance Requirements

i. Wetlands are geomorphically and hydrologically similar to natural, well-functioning reference wetlands of similar types in the vicinity. Site and reference wetlands are similar in topography, pool and channel patterns, vegetation zones, depths of various zones, edge length to area ratio and other physical factors. Hydrologically, site and reference wetlands are similar in wetland hydroperiod (depth, frequency and duration of inundation).

ii. Wetland habitat and riparian zones are dominated by native vegetation that provide wetland and riparian functions of bank stability, infiltration, nutrient absorption, habitat value for wildlife and shade. Wetland types, whether emergent, scrub-shrub or forested are characteristic of existing local wetland types identified and consistent with habitat needs for known local wetland species. Invasive vegetation within the riparian area has been removed and replaced with native plantings.

iii. Wetland and riparian buffers adequately infiltrate and/or filter site sheet flow runoff, in consideration of steepness, substrate and degree of vegetation. Riparian plantings can assist in meeting this requirement.

iv. Wetland areas and riparian buffers are protected in perpetuity by conservation easements or other means.

Standard I.7S.6: Agency or Owner has adopted a post-construction inspection and maintenance plan to ensure that riparian and wetland features are in a properly functioning condition and invasive species are controlled.

Performance Requirements

i. The plan lists activities to perform, provides an activity schedule, and identifies responsible parties. Adaptive management triggers actions that respond to changes in performance.

ii. The plan as a whole, or its elements therein, have been adopted into site agreements or other guiding documentation that formalizes the appropriate managing authority's responsibility to implement and enforce all aspects of the plan on both private property or common property managed for the public good.

Glossary

Best management practices (BMPs). Schedules of activities, prohibitions of practices, maintenance procedures and structural or management measures that prevent or reduce the release of pollutants and other adverse impacts on the environment.

Bioengineer. The use of biological processes in developing solutions for engineering problems.

Bioretention. Bioretention facilities are vegetated depressions that provide stormwater treatment during the capture and infiltration of water runoff through a biofiltration soil medium. Runoff treatment is provided through physical, chemical and biological treatment processes as water comes into contact with soil, vegetation and media.

Biodiversity. Diversity of plants and animals in the environment.

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

Catchment. The area from which rainfall falling on the ground flows into a river, lake or other water body. Can be divided in smaller sub-areas depending on scale.

Certification Standards. A set of specific guidelines or BMPs developed by Salmon-Safe for site developers, site designers and land managers with an interest in infrastructure in a manner that protects imperiled salmonid species and other associated aquatic and terrestrial habitat elements.

Connectivity. The degree to which movement is facilitated or impeded between resource patches. This can include physical connections themselves as well as how resources can or cannot move within patches.

Desktop analysis. Gathering and analyzing information that is available in reports, maps and online sources in a preliminary manner. This is augmented by field analysis.

Ecological corridor. Landscapes that are often linear, providing connectivity between larger patches and core habitats. Different species have different requirements but can be contiguous linear, with uninterrupted strips and landscapes for movement, and stepping stones, which are a series of smaller interim patches for shelter, food and rest.

Envision. A certification program for infrastructure projects developed by the Institute for Sustainable Infrastructure (ISI) and the Zofnass Program for Sustainable Infrastructure.

Evaluation team. Infrastructure assessments are conducted by a team of two or three qualified, independent experts hired by Salmon-Safe. The evaluation team is well versed

in aquatic ecological science, development planning and design, as well as landscape management.

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.

Floodplain. An area adjacent to a river or stream that experiences period inundation during floods. Typically the floodplain is relatively flat.

Flow control. Temporary storage (detention) of stormwater during storm events to delay the timing and rate at which water enters receiving waters or the conveyance system to prevent flooding. Flow control may also be provided through infiltration, which is preferable where conditions are suitable because it reduces the volume of stormwater that enters receiving waters and more closely reflects pre-developed hydrology.

Flyway. A route between breeding and wintering areas taking by concentrations of migrating birds.

Green roof. A low-impact development stormwater technique consisting of soil media and vegetation that reduces impervious area associated with traditional roofing materials and promotes retention, evapotranspiration and treatment of rainwater on vegetated roof surfaces.

Greenway. A linear landscape or wildlife corridor that incorporates linear recreation in the form of trails and bikeways. Often incorporated into repurposed easements and corridors for other infrastructure (i.e., rails to trails, utility corridors).

Herbicide. A substance that is toxic to certain plants and used to remove unwanted vegetation.

Impervious surface. A hard surface area that either prevents or slows the entry of water into the ground as compared with natural conditions (prior to development) and from which stormwater runs off at an increased rate of flow or in increased volumes. Common impervious surfaces include but are not limited to rooftops, walkways, roads, parking lots and other concrete or asphalt surfaces.

Infiltration. The downward movement of rainwater or surface water through the soil. Infrastructure. Constructed features of the build environment including roads, water and wastewater treatment systems, power utility elements, heavy and light railways, bridges and associated buildings and site features.

Integrated pest management (IPM). An environmentally sensitive approach to pest management that relies on a combination of methods for evaluation, decision-making and control. The process includes:

(1) setting thresholds for actions;
(2) monitoring and identification of pests;
(3) prevention of pests through design and operations; and
(4) control of pests through appropriate methods based on effectiveness and risk.

Invasive vegetation. A plant that is not native to a specific location (introduced) and that has a tendency to spread and outcompete native plants, causing damage to the environment, economy and human health.

Large woody debris (LWD). Wood that is naturally occurring or artificially placed in streams. LWD is essential to a healthy stream because it provides habitat diversity and protects against flooding. Many streams negatively affected by human use lack a necessary amount of LWD.

LEED (Leadership in Energy and Environmental Design). A green building rating system established by the United States Green Building Council (USGBC).

Low-impact development. A stormwater management approach that seeks to mitigate the impacts of increased runoff and stormwater pollution using a set of planning, design and construction approaches and stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration and reuse of rainwater and can occur at a wide range of landscape scales.

Management category. In the context of these Certification Standards, six primary management categories have been defined to express the desired outcome of habitat conditions in a given project area:

(1) Instream habitat protection and restoration;
(2) Riparian, wetland and locally significant vegetation protection and restoration;
(3) Stormwater management;
(4) Water use management (irrigation activities);
(5) Erosion prevention and sediment control; and
(6) Chemical and nutrient containment.

Nutrient. Components that organisms use to survive and grow.

Performance requirement. Specific, measurable criteria that represent the desired outcome for habitat conditions associated with a project. Performance requirements are a subset of their broader Certification Standards.

Permeable pavement. A walking or driving surface constructed of open-graded asphalt, porous concrete or pavers that allow rainfall to percolate into the underlying soil or aggregate storage reservoir beneath the pavement.

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.

Planter. A vegetated reservoir with structural walls that treat stormwater through processes similar to those of bioretention. A flow-through planter is lined to prevent infiltration of stormwater due to unsuitable soils or other site constraints.

Pollinators. An organism that moves pollen between flowers of plants to aid in reproduction.

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

Rainwater harvesting. The accumulation and deposition of rainwater for reuse onsite, rather than allowing it to runoff, through the use of cisterns, tanks and other storage devices. Can be reused in landscape or integrated in buildings through non-potable and potable uses with appropriate treatment.

Reference wetland. Existing wetlands that provide a baseline with similar characteristics and attributes to be use for designing, enhancement and planning new wetlands. The establishment of similar systems allows the ability to set goals and comparison of ecological integrity for measuring success.

Riparian habitat. Characterized by vegetated areas along bodies of surface water, including streams, wetlands and lakes. Typically, riparian habitats are distinct from upland areas, demonstrating an obvious difference in vegetation types, densities and structure.

Salmon-Safe. Salmon-Safe is an independent, nonprofit organization devoted to restoring agricultural and urban watersheds so that salmon can spawn and thrive. Founded as a project of the Pacific Rivers Council, Salmon-Safe became an independent organization in 2002 and is based in Portland, Oregon.

Semi-pervious. A condition where a surface only admits a portion of the water through to underlying layers.

Significant vegetation. Particular trees or larger patches of vegetation that have high ecological and cultural value. These may include intact patches and corridors

of native vegetation and habitat, unique or large specimens, historic, endangered or rare vegetation and vegetation that contributes to the natural heritage of a region.

Sub-lethal impacts. Refers to toxins that do not kill but make organisms sick or change their behavior.

Surfactant. Compounds that lower the surface tension between two liquids or between a liquid and a solid. Often used in conjunction with herbicides and pesticides.

Sustainable sites initiative. A certification program that requires new or redevelopment to evaluate their site in terms of ecosystem services and do the maximum amount feasible to support and regenerate those services.

Upland. Typically drier, more exposed areas of higher land, upslope of moist and wetter zones adjacent to rivers, streams, wetlands and stormwater facilities.

Water reuse. The use of harvested and reclaimed water for a specific purpose such as irrigation, non-potable uses, toilet flushing and potable uses such drinking water, with appropriate levels of treatment.

Wetlands. Areas that are inundated or saturated by ground or surface water at a frequency and duration sufficient to support hydric soils and vegetation typically adapted for life in hydric soil conditions. Wetlands are regulated at the federal, state and local levels.

APPENDIX A: Required Documentation for Salmon-Safe Infrastructure Projects

Below is a list of typical documentation and plans required for evaluation during the certification process. All of these submittals may not be required for all projects seeking certification. The evaluation team will work with the applicant to determine which submittals are required for a given infrastructure project.

Planning-Level Certification

Standard 1.1P—*Stormwater Management*

- Descriptions of master planning documents, codes and/or policies that demonstrate compliance with these standards
- Stormwater design guidelines that include stormwater hierarchy
- Description of maintenance program and practices

Standard 1.2P—*Water/Wastewater*

- Description of sustainable water and wastewater strategies
- Tracking tools and performance, as available
- Water conservation plan

Standard 1.3P—*Construction Practices*

- Description of erosion control training, manuals and/or contractor pre-qualification requirements
- Tracking tools and performance for waste diversion rates, as available

Standard 1.4P—*Water Quality Protection*

- Integrated pest management (IPM) Plan
- Documentation of policies, standard specifications or other guidance restricting use of toxic chemicals

Standard 1.5P—*Ecological Functions*

- Maps and survey data
- Descriptions of coordination efforts with neighboring jurisdictions

REVIEW PHASE 1 > SUBMITTALS—*Site Assessment and Planning Review*

Documentation for Review Phase 1 consists of conceptual plans and a report summarizing the results of the site inventory and assessment. Note that the report may consist primarily of maps, tables and figures, with explanatory text provided only as needed. Possible items to be covered in the report are listed below. See the Certification Standards for additional information.

(1) **Developed site conditions.** Provide a table summarizing areas of impervious area, landscaped area and undisturbed natural areas. This may be based on a survey, site visit or visual inspection of aerial photographs, depending on the scale of the site. Differentiate between "pollutant-generating" impervious surfaces (roads, parking areas and other areas subject to vehicular traffic) and impervious sidewalks or bike lanes. Provide estimates of existing roof areas and document the roof material.

(2) **Identify existing infrastructure (sanitary, storm, water).** Identify any special stormwater mitigation projects that have been completed in the five years preceding the initiation of certification evaluation, such as reduction in pavement, detention ponds or biofiltration swales.

(3) **Site soils and drainage.** Map soil types, stability and hydraulic properties (identify areas of high infiltration capacity soils). Document depth to groundwater.

(4) **Water quality.** Map any contaminated soils onsite.

If streams, wetlands and riparian habitat areas area present onsite:

(5) **Information on stream channels.** (if applicable)

- ***Watershed map*** including any stream channels on the site.
- ***Inventory and mapping of fish species distribution*** (existing and potential distribution of native salmonid species).
- ***Classification of stream channel types.*** At a minimum, these stream channel types shall include: (1) fish-bearing, (2) potential fish-bearing, and (3) non-fishbearing, but greater than two feet in bankfull width and connected to a fish-bearing stream.
- ***Assessment of channel condition.*** The assessment shall include a summary of existing habitat impacts by general type, such as locations of channelized streams, severely eroding or unstable banks and other parameters. Include a map of the 100-year flood-plain and document the source or method of determination.
- **Stream crossings.** Map and evaluate stream crossings to determine the need for fish passage and flood conveyance. Conduct a field investigation to assess whether crossings are complete or partial barriers to fish passage.

(6) **Describe the condition of riparian zones of all stream types listed above** (if applicable). Document the following:

- *Existing protected buffer widths*
- *Condition and type of vegetation*
- *Length of riparian vegetation free from intrusions from roads, utilities and other clearings (riparian continuity)*

(7) **Wetlands inventory, mapping and assessment.** Inventory and mapping using National Wetlands Inventory (NWI) or local wetland inventory data is the minimum acceptable level of mapping. Wetland assessment will address types of impacts and whether the wetland historically or currently provides fish habitat.

REVIEW PHASE 2 > SUBMITTALS—*Review of Plan Submittal*

(1) Submit **copies of design drawings and renderings for building, site and infrastructure plans**, including plans, permit documents and/or other planning drawings that clarify the project intent.

(2) Submit a **narrative describing how the site design has incorporated items from the recommendations summary provided in Review Phase 1**, the standards and performance requirements defined in the applicable standards.

(3) Submit any relevant **local, state or federal permit applications and/or records of approval for permits**.

(4) Provide documentation showing that the **standards and performance requirements defined in all relevant standard have been incorporated in design and permit plans**.

If streams, wetlands and riparian habitat areas area present onsite:

(5) Applicable **environmental permitting documents addressing compliance**.

REVIEW PHASE 3 > SUBMITTALS—*Salmon-Safe Certification of Constructed Site*

The following submittals are required for Review Phase 3:

(1) *Operations & maintenance plan (O&M) for stormwater control features (Standard I.1.S.10)*

(2) *Integrated pest management (IPM) plan and nutrient management plan (Standard I.4.S.10)*

(3) *As-built drawings showing any relevant changes to submitted plans in Review Phase 2*

(4) *Evidence that elements within each of these plans have been incorporated into the development's O&M guidelines or other binding documents*

(5) *A list of qualified personnel or contractors that will conduct monitoring and management activities over the life of the project*

If streams, wetlands and riparian habitat areas area present onsite:

(6) *Operations & maintenance plan (O&M) for instream habitat features (Standard I.6.S.5)*

(7) *Operations & maintenance plan (O&M) for riparian and wetland features (Standard I.7S.6)*

APPENDIX B: Water Conservation Plan Guidance

Water conservation measures reduce irrigation water use to the minimum necessary to support maintenance of infrastructure.

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

1. Conservation plan—watering is focused on limited areas based on varying plant needs and human use objectives.
2. 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.
3. 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.

APPENDIX C: Model Construction Phase Stormwater Management Program

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:

1. 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.

2. 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 will not be worked again, with permanent vegetation supplemented with highly effective temporary erosion control measures until at least 90% 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% or greater, before the rain falls, stabilize or isolate disturbed areas that could drain off the site and are being actively worked or will be within three days, taking measures that will prevent or minimize, to the greatest extent technically feasible, the transport of sediment off the property.

3. 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.

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

5. 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.

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

    - Flow of relatively clean offsite 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.

7. 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.

8. Specify construction road stabilization.

9. Specify wind erosion control.

10. 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 .

11. Construction vehicles larger than pick-up trucks parked for more than two days shall be located so that any fluid leaks cannot contaminate stormwater runoff. An effective way of preventing contamination is to park in a location that cannot drain into any stormwater conveyance leaving the site. If a selected location could drain away, it should be modified by slightly recessing the parking spots to prevent draining out. An alternative if such a location cannot be found, is to place leakage collection trays under the vehicles. Any vehicle observed to be leaking any significant quantity of a fluid should be repaired immediately.

APPENDIX D: IPM, Nutrient and Chemical Management Plan Guidance

Salmon depend on clean water, free from harmful levels of fertilizers (nutrients), pesticides (herbicides and insecticides, fungicides and other biocides), stormwater runoff pollutants and organic waste. These contaminants can travel long distances in stormwater runoff from a project site to receiving waters. The principal methods to avoid contamination of salmon-bearing waters are to minimize overall inputs of these contaminants, restrict the type of inputs, and develop an acceptable method of application through a comprehensive management program, such as an integrated pest management (IPM) plan. The agency or owner shall require that guiding O&M documents for each eligible phase of the project incorporate a Salmon-Safe approved IPM, nutrient and chemical management plan to ensure maintenance of Salmon-Safe practices over time.

IPM Requirements within the Plan

An IPM plan or policies are developed to promote management practices that reduce the impact of, the unnecessary reliance upon, or eliminate the need for hazardous chemicals and pesticides. Hazardous chemicals and pesticide use on the development should not result in contamination of stormwater or streams with amounts of any chemical or pesticide harmful to salmon or aquatic ecosystems. These practices generally 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 chemical or pesticides. The IPM plan should comply with the following guidelines:

i. Type of pesticides—All use of pesticides within the project area, including waterways, waterway buffers and uplands, is limited in an IPM program by the specific policies on the method of use, including application type, rate, frequency, location and amount. Maintenance staff or contractors use only those pesticides that are on an approved list for the site. 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 development management to ensure that potential harm to salmon and aquatic ecosystems is minimized.

ii. Minimize aquatic impacts from high-hazard pesticides—The use of any pesticides on the Salmon-Safe Cautionary List of High-Hazard 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 negligible (Appendix E: *Salmon-Safe High-Hazard Pesticide List*).

iii. **Restricted use zones**—Pesticide use is specially managed within: waterways and adjacent waterway buffer areas. For the purpose of pesticide application, the buffer zone is defined as a corridor of land 60 feet in width on each side of a stream or other body of water (no-development buffers may be wider). Measurement of this buffer zone begins at the edge of the water line at the time of application and is measured horizontally as if on a map. Anticipated seasonal or weather-related changes affecting water level will be included in the decision-making process when dealing with buffer zones.

iv. **Pesticide treatment of trees**—Within riparian buffer zones, pesticides are used only on rare occasion for treating tree pests or diseases. Injection of pesticides within tree tissues or paintbrush application are the only application methods for trees allowed in riparian buffer zones.

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 that the applied materials reach targeted plants or targeted soils surfaces.

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 is above 5 mph or wind direction would carry pesticides toward open water. No spraying is done during an inversion.

vii. **IPM program**—Pesticide applicators, whether employees or contractors, are trained in the IPM plan and implement it fully.

viii. **Pesticide applicator licensing**—All persons applying pesticides must be currently licensed as private pesticide applicators by the applicable state agency (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.

ix. **Chemical and pesticide storage, rinsates and disposal**—The managing partner of the development has rigorous policies in place to ensure that no contamination of stormwater or streams occurs due to the storage, cleaning of equipment or disposal of chemicals and pesticides. These policies are adhered to by maintenance personnel, contractors and residents.

x. **Pesticide tracking system**—Detailed records are maintained for all pesticide applications on the part of the managing partner, including applications to aquatic areas and buffer zones, consistent with state requirements.

xi. **Pesticide application timing**—Pesticides are not applied when it is raining (unless otherwise directed by label instructions) or when there is a 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.

Nutrient Management Requirements within the Plan

The potential for nutrient and lime use to contaminate stormwater and streams can be minimized through 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. The nutrient management plan should comply with the following guidelines:

i. **Types of fertilizers**—Fertilizer types are tailored to the existing soil conditions and plant requirements. Slow-release, organic fertilizers or compost 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 are carefully considered (see below).

ii. **Fertilizer application amounts**—In general turf and shrub bed areas, soluble fertilizer rates of application are limited to no more than 0.5-lb N/1,000 square feet with restraints on timing to minimize fertilizer in stormwater runoff.

iii. **Low-fertilizer landscaping**—Plants with low-fertilizer requirements are used for landscaping to the greatest extent technically feasible.

iv. **Focused use**—Fertilizer is used only on high- and moderate-intensity use areas, such as flower beds, ball fields, golf courses, some turf areas and planting beds, and some plantings associated with construction and restoration projects, if at all. Lime is used to adjust pH to minimize fertilizer use where suitable, in a manner that does not impact water quality.

v. **Buffer zone width**—Fertilizer and lime use is highly restricted within a waterway (riparian or wetland) buffer zone.

vi. **Use within watercourse buffers**—Fertilizer use in buffer zones of waterways is restricted depending on the intensity of application and type of fertilizers. The allowable use of fertilizer also varies depending on whether it is being used for routine maintenance or for restoration and construction projects.

vii. **Soil testing**—Periodic soil testing is used to determine the need for fertilizer (phosphorus and potassium), compost and lime relative to appropriate benchmarks established by the development managing

partner. Testing is conducted a minimum of twice per year and prior to fertilizer application.

viii. Soil fertility—Practices such as onsite mulching of leaf and grass clippings are used to reduce the need for fertilizer.

ix. A summary report of annual fertilizer use is provided that shows a stable or declining trend in synthetic fertilizer use development-wide, taking into account the changes in acreage managed, specific uses and other relevant factors.

Other Contaminant Management within the Plan

Other contaminants, such as animal and chemical waste, should not contaminate storm-water or streams leaving the project site. Recognizing that the managing partner may have a limited ability to control residents, the public and actions of other agencies, the project should comply with the following guidelines:

i. Chemical use control—Eliminate or minimize the use of chemicals commonly used to maintain infrastructure that may cause undue risk of harm to salmon and aquatic species. Evaluate various solvents, deicers, sealants, etc., to choose the least toxic or harmful product to aquatic ecosystems without compromising the health, safety and welfare of the human environment.

ii. Animal waste control—The development managing partner fosters management and education policies regarding dog or other domestic animal waste control that are effective in minimizing the contamination of stormwater or streams.

iii. Wildlife waste control program (geese, ducks)—If necessary and to the greatest extent technically feasible, a management program is implemented that ensures duck and goose waste does not contaminate stormwater or streams.

APPENDIX E: Salmon-Safe Infrastructure 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 LIST OF HIGH-HAZARD PESTICIDES			
INSECTICIDES			
abamectin *	dimethoate (3)	methamidophos (3)	propargite * (7)
acephate	esfenvalerate *	malathion * (1)	spirodiclofen *
bifenthrin *	ethoprop (3)	methidathion	spirotetramat
carbaryl (2)	fenamiphos * (3)	methomyl (2)	tefluthrin *
chlorantraniliprole	fenbutatin-oxide *+ (7)	methyl parathion	terbufos *
chlorpyrifos *+ (2)	fenpyroximate *	naled * (3)	thiacloprid
cyfluthrin *	fipronil *	novaluron	tralomethrin *
cypermethrin *	imidacloprid	permethrin *	zeta-cypermethrin
diazinon *+ (1)	indoxacarb	phorate *+ (3)	
diflubenzuron (7)	lambda-cyhalothrin *	phosmet * (3)	
FUNGICIDES			
azoxystrobin *	fenarimol	picoxystrobin *	trifloxystrobin *
bensulide	folpet *	propiconazole	triflumizole
captan	iprodione	pyraclostrobin *	
carboxin	mancozeb	quintozene (PCNB)	
chlorothalonil * (4)	maneb *	thiram	
HERBICIDES			
2,4-D (4)	dithiopyr	norflurazon+	thiobencarb
alachlor	diuron+ (4)	oryzalin (5)	triallate
atrazine	fluazifop-p-butyl	oxadiazon+	triclopyr BEE (4)
bromoxynil *	isoxaben	oxyfluorfen	trifluralin+ (5)
dichlobenil	linuron (4)	pendimethalin+ (5)	paraquat dichloride
diclofop-methyl	metolachlor	pentachlorophenol (PCP)*	simazine

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*

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

An infrastructure project 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.***

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www.salmonsafe.org

VISIT SALMONSAFE.ORG TO DOWNLOAD A FILL-AND-SAVE VERSION OF THIS FORM

APPENDIX F: ANNUAL CERTIFICATION REPORT AND VERIFICATION FORM

All organizations

Please complete this form down to the black bar.

Organizations with conditions

Please complete the entire form.

ABOUT CERTIFIED ORGANIZATION

Agency Name	Date	Year First Certified
Primary Contact	Title	
Phone	Email	

STATEMENT OF ENVIRONMENTAL COMPLIANCE—*Provide a statement regarding your agency's compliance record during the last year. In the event your organization was issued a violation of non-compliance by a regulating agency, please detail the cause, the corrective action the organization conducted and the end result as applicable. Salmon-Safe may revoke the certification in the event of a compliance violation, but will determine this on a case-by-case basis.*

SUMMARY OF ACTIVITY—*Provide a statement summarizing major infrastructure changes including new construc- tion or restoration activity over the past year. Any operational changes impacting your Salmon-Safe certification?*

SALMON-SAFE CERTIFICATION COMPLIANCE	☐ Certification is conditional ☐ Certification conditions have been satisfied ☐ Certification issued without conditions

• **CONDITION 1** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		

• **CONDITION 2** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		
• **CONDITION 3** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		
• **CONDITION 4** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		
• **CONDITION 5** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		
• **CONDITION 6** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		

• **CONDITION 7** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		
• **CONDITION 8** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		
• **CONDITION 9** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		
• **CONDITION 10** *(describe condition)*	Met Condition? ☐ Yes ☐ No ☐ In Process ☐ Documentation Attached	CONDITION VERIFICATION *Condition Cleared* ☐ Yes ☐ No Reviewer Initials _____
Action Taken to Correct Issue		

ADMIN USE ONLY *Annual Certfication Report* ☐ APPROVED ☐ Not Approved

Name _____ Date _____

SALMON SAFE