Diversity by Design

Restoring Habitat for Species at Risk On BC's South Coast

Workshop Summary

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Fraser Valley Conservancy
Placing lands in trust for our future

SOUTH COAST CONSERVATION PROGRAM
Protecting and Restoring at Risk Species and Ecological Communities on BC's South Coast

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Background image: Elk Mountain by Tamsin Baker

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Special thank you to staff at the Stanley Park Ecology Society for hosting workshop #1

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NATIONAL CONSERVATION PLAN PLAN DE CONSERVATION NATIONAL Canada

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Western Painted Turtle (coastal pop.), Chris Lee

The Concept

1. Background

1.1 Diversity by Design Partners

The SCCP is a multi-partner conservation program facilitating the protection and restoration of endangered species and ecological communities on BC's South Coast. The SCCP was established in 2005 by government and non-government organizations to fill coordination gaps between various levels of government, conservation groups, land use interests and local communities to conserve species and ecological communities at risk. The SCCP plays a vital role in assisting various stakeholders in navigating the complexities around species at risk. This is accomplished through a range of activities, including: workshops on guidelines and stewardship practices, networking through social media and supporting on-the- ground applied science on priority species and their habitats.

The Fraser Valley Conservancy (FVC) was established in 1998 as a non-profit society and federally registered charity to protect land and water for future generations. Since then the FVC has secured over 40 acres of wildlife habitat containing woodland forest, mature forests, creeks and wetlands that protects our health for our future. The FVC believes that natural areas in the Fraser Valley are home to the richest biodiversity in the lower mainland, but development patterns have led to fragmentation of wildlife habitat and jeopardizes remaining natural areas.

1.2 Why 'Diversity by Design'?

BC's South Coast is a biodiversity hot-spot. Land-use decision makers have an expectation that species monitoring and habitat restoration needs will be filled by stewardship and professional expertise. This will not be achieved without these audiences receiving appropriate skills, training, up-to-date tools and expertise. Diversity by Design is the new approach by the South Coast Conservation Program and partners such as the Fraser Valley Conservancy being developed to address this need. Developing tools and training resources that take a holistic approach to the social and environmental aspects of restoring critical habitat[1] is a key step in ensuring effective and long-lasting conservation and recovery for BC's species and ecological communities at risk.

[1] Critical habitat is a term specific to species at risk recovery under the federal Species At Risk Act (SARA) and is defined as "habitat that is necessary for the survival or recovery of a SARA listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species."

1.2.1 Diversity by Design Modules:

The "DxD" series[2] is comprised of four modules for restoring a number of different ecological communities at risk on the South Coast with a species at risk and multi-species focus. They include the main guidance document and three stand-alone modules on wetland communities (Module 1), forest communities (Module 2), and stream and riparian communities (Module 3).

[2] Diversity by Design (including the guidebook and ecological community modules can be downloaded from http://www.sccp.ca/projects/restoration-planning-diversity-design


Northern Red-legged Frog, Paul Berlinguette

2. Workshop Summaries

The SCCP in partnership with the Fraser Valley Conservancy hosted two full-day workshops (Metro Vancouver and Fraser Valley) to engage a broad array of participants. Workshops were hosted in Stanley Park (Vancouver) and Aldergrove (Langley). One workshop focused on forest communities (Stanley Park, City of Vancouver) while the second focused on aquatic communities (Aldergrove Regional Park, Langley). Both workshops were well attended, with a total of 41 participants from across both regional districts. The Fraser Valley session drew the majority of attendees. Workshop details including agendas and a list of organizations represented is included in Appendix A. Each workshop provided an introduction on species at risk protection in BC/Canada, with examples from the South Coast, an overview of the SCCP's newly developed 'Diversity by Design' modules, examples of restoration efforts that partners have been working on in the South Coast, and finally, a field tour of some of these sites. The workshops also provided an opportunity to discuss and network on the gaps, challenges and opportunities related to habitat restoration for species at risk.

2.1 Workshop #1 – Vancouver, Forest Communities

2.1.1 Where shrews walk on water: Diversity by Design for BC's South Coast
Pamela Zevit RPBio., SCCP Program Coordinator.

Key Messages:

- Species at risk are listed by a number of different agencies including the BC Conservation Data Center, COSEWIC, and the federal Species at Risk Act; however, these listings do not necessarily translate to legal protection
- The SCCP takes a bioregional perspective: 3 forest districts, 5 regional districts, 39 municipalities, and complex political landscape. Currently the population of the South Coast is ~2.5 million and due to double by 2036. It is also a biodiversity hot-spot. This is a very difficult context in which to advance conservation actions, as species don't obey human boundaries
- In terms of species at risk protection, the Species at Risk Act is the main legislative framework that the SCCP works with
- Species may be listed as Extirpated, Endangered, Threatened, or Special Concern
- SARA-listed Threatened and endangered species receive a Recovery Strategy, Action Plan and Critical Habitat for their recovery is identified; whereas Special Concern species receive a Management Plan

- It is often not well understood that SARA applies on all land, but how it applies depends on the ownership of the land. The majority of land in Canada is not under federal jurisdiction
- The federal government is responsible for the application of SARA and protecting critical habitat on federal lands, territories, for aquatic species (fish but not amphibians) covered under the Federal Fisheries Act, and migratory birds covered under the Migratory Birds Convention Act.
- The provinces and territories are responsible for most of the land base and conservation of species on their lands except certain fish species. Conservation measures are voluntary but the federal government assesses whether species are being *effectively* protected by the provinces and territories as part of a bilateral agreement to protect species at risk.
- If the federal government decides that a province or territory is not providing effective protection, and Order may be given to protect a species at risk or its habitat[3]
- Such an Order was given for protection of the Greater Sage-Grouse in Alberta and Saskatchewan and is being considered for Western Chorus Frog in Quebec.
- A sighting of a SAR does not mean that location or surrounding area automatically becomes identified as critical habitat, as the information must be assessed and validated before being considered for inclusion in recovery planning (and potential legal protection). As conservation practitioners however it is essential to ensure that occurrences are identified and information is shared with appropriate land-use authorities such as local, provincial and federal governments so that the habitat and species can be effectively mapped and added to the public record.
- How much is shared with the public about where SAR is located also depends on the regulator. Some people are afraid that by making information publicly available, you are endangering the species more, whereas, other people want to share that information as widely as possible to avoid accidental harm and destruction of critical habitat.
- The focus of habitat restoration work in BC for much of the past has been on salmon. We are just beginning to go in a new direction by looking and at multi-species, ecosystem-based approach that includes species at risk, and that is what Diversity by Design is all about.

2.1.2 An Introduction to the Diversity by Design Restoration Planning Toolkit
Patrick Lilley, RPBio and Pamela Zevit RPBio, SCCP Program Coordinator

Key Messages:

- Habitat restoration is an important component of species and ecosystems at risk
- Why a multi-species approach? It maximizes project benefits, avoids unintentional negative effects to other species, and is more financially efficient
- The Diversity by Design Toolkit is made up of 4 booklets: 1 over-arching "How-to" document, and one each on restoring wetland, forest, and stream & riparian communities
- Many more different types of ecosystems occur on the BC South Coast. The SCCP may later decide to make modules for other ecological communities, such as Coastal Sand Ecosystems which Tamsin Baker, Stewardship Coordinator for the SCCP works on. A number of good documents around Coastal Sand Ecosystem restoration exist, however, so it was not included at this time

[3] Imminent Threat Assessment for the Western Chorus Frog: http://sararegistry.gc.ca/default.asp?lang=En&n=CE6C8EB9-1

- Target audience includes stewardship groups, environmental and parks department employees, municipal planners, private landowners and even consultants and developers
- Ecological restoration for the purposes of the Diversity be Design guidebooks refers to "any activity undertaken to improve the ecological integrity of a particular species, habitat, ecosystem, or landscape"
- Keys to Successful Habitat Restoration Projects (Guiding Principles):
    - Put protection over restoration
    - Take a long-term view
    - Design for diversity
    - Adopt a socio-ecological approach
    - Apply the best available knowledge
    - Set clear objectives
    - Apply adaptive management
    - Document your results
- Protection over restoration: it is always better to try and protect the original habitat first. The point isn't that we should avoid restoration, or that we should allow degraded sites to naturally regenerate, but that we shouldn't destroy habitat with the thinking that we can just recreate it in another area
- Sometimes habitat gets more protection when a group starts working to restore it; because it brings awareness and a sense of ownership to the area. However, there are instances where restored habitat has been destroyed because of changing land use, priorities, new owners etc.
- Preventing sites from becoming degraded during the process of development (i.e. before a SAR assessment can occur) is important from a municipal government perspective
    - Ecological inventory – what species are currently here? Determine habitat suitability (what species could potentially move into the site once restored or introduced). Identify multi-species restoration opportunities
    - Assessing opportunities, constraints, and risks – is restoration necessary, or does the habitat just need tweaking? Is the hydrology and topography sufficient to make a wetland? Could restoration efforts harm existing species?
    - Project planning and consultation – make a restoration plan (goals, design drawings, funding), consult with stakeholders and apply for any necessary permits
    - Implementation – baseline monitoring, do the restoration work, implement mitigation measures
    - Monitoring and adaptive management – come up with a monitoring plan and collect data long term to identify successes/failures. Manage the site. Repeat from step 1, if necessary, using information collected during monitoring to make decisions
- Because non-profits often depend on funding cycles, this can constrain project planning. They may not have a chance to do a full inventory before restoration. An inventory beforehand can tell us that if a site is in decent shape, and actually would benefit more from protection than a restoration project. It is also important to plan for monitoring after the project ends however it is often hard to get funding to go back and do this, or to manage invasives afterward. We need to start being more strategic and employ a long-range vision in how we approach restoration projects.

- Examples of Ecological inventories: BioBlitzes – the SCCP has facilitated 4, Stanley Park Ecology society has done 2, and the longest annually occurring one has been in Whistler since 2006

Other Resources:

- Develop with Care
- Streamkeepers Handbook
- Naturescape BC
- Species at Risk: A Primer for BC
- Stewardship Centre for BC

2.1.3 Approaches and principles for forest ecosystem restoration – from planning to implementation
Mike Coulthard, RPBio, RPF, Diamond Head Consulting

Key Messages:

- Most of the South Coast falls into two main biogeoclimatic zones: Coastal Western Hemlock and Coastal Douglas-fir
- Species at risk in South Coast forests include: Western Screech Owl, Olive-sided Flycatcher, Oregon Forestsnail, Pacific Sideband, Western Toad, Townsend's Big-eared Bat, Trowbridge's Shrew, Northern Spotted Owl, and Marbled Murrelet
- Steps of Planning for Success:
    - Understanding the Systems –living and non-living components
    - Minimize Impacts – manage disturbance and agents of change (invasive species, pests, disease, erosion, windstorms, climate change, vandalism, etc.)
    - Secure the Building Blocks – restore the foundation for healthy ecosystem function (Soil, water, erosion and sediment control)
    - Repair the Fabric – establish plant communities
    - Include Habitat Features – provide species specific habitat features
    - Monitor and Measure – adapt to challenges and evaluate success
- Take note of existing conditions of living (wildlife, invasives, tree health) and non-living (soils, topography, hydrology; socio-economic) components
- Always use native top soil where you can – it contains natural seed bank for re-establishing native plants, also less risk of introducing invasives, and is cheaper than bringing in mulch.
- Know your winners – plant species which will do well right away (e.g. pioneer species versus climax species) and plan for climate change
- Sometimes it is better to plant smaller plants (e.g. plugs) rather than plants with large, well developed root systems. Larger stock has been cultured for a prolonged period in 'ideal' conditions in a nursery and may be less able to adapt to transplanting into tough growing environments.

- Don't plant trees too dense to preclude natural regeneration. Fall is best time to plant as it allows fall and spring root growth before the subsequent dry summer hits. Consider fencing to protect against beavers/deer/voles
- The ideal situation is to have a multi-stage planting scheme where you plant deciduous, first-successional species, and then come back and plant conifers. Example: seed with alder and then go back after 5 years and thin the alder, then start planting other species
- Alders do well in retention/drainage ponds that have steep sides dug in clay as well as gravel, which is often spread to help with erosion control. Alder adds nitrogen, and an organic layer to disturbed soils.
- Habitat features include: Downed wood, wildlife trees, perches for raptors, nest boxes, rock piles, bush piles, and artificial structures

2.1.4 Forest and Stand Management Strategies and Actions for Species at Risk
Norm Caldicott, RPF, BCIT Forest and Natural Areas Management Program Instructor

Key Messages:

- Each activity, planned or carried out, undoubtedly directly or indirectly affects species at risk.
- Practitioners need to strive to adhere to the law, abide by personal ethics and practices and guidelines required by the forestry industry
- Forestry management goals: low cost, low maintenance, survivorship, high productivity, provision for climate change etc. Way down at the bottom of the list is delivery of social and environmental values – including protection of species at risk
- Non-federal land is governed by "effective protection". For Forestry Professionals, obligations with respect to managing forests for species at risk are guided by the Forest and Range Practises Act and the Wildlife Act [on Provincial Crown land]
- Example: BCIT Woodlot in Maple Ridge – certain amount of forest set aside as Riparian Management Area or in Rotational Wildlife Tree patches
- Woodlot 007 is a partnership with Kwantlen and Katzie First Nations, therefore managed for additional (e.g. cultural) values
- If designated Wildlife Habitat Areas exists, the forest management plan must also include consideration for dependent species (i.e. habitat required for the survival of species at risk such as Coastal Giant Salamander, Grizzly Bear, Pacific Water Shrew, Tall Bugbane, Northern Spotted Owl, and Coastal Tailed Frog etc.)
- If no Wildlife Habitat Areas, species at risk that may occur must also be considered (e.g. Northern Red-legged Frog) but not based on defined non-harvest areas
- Manage for resource values AND all those species at risk by consolidating management – bring strategies together and locate them into common areas of management (e.g. Riparian Management Areas)

- Best Management Practises:
    - Where streams are close together, reserve the entire area between them, beyond what's required
    - Maintain stream bank vegetation along watercourses with machine-free zones
    - Limit stream crossings
    - Maintain complex stand structure
    - Thin young stands near streams to reduce blow downs

2.2 Updates from the Neighbourhood

2.2.1 Vancouver's Biodiversity Strategy
Nick Page, RPBio, Vancouver Park Board

The Vancouver Park Board's Biodiversity Strategy presents a goal, target, objectives, and actions for supporting biodiversity in parks, and on other public and private lands, across the City of Vancouver. Together with the Urban Forest Strategy, the Rewilding Action Plan, and the Vancouver Bird Strategy, it provides a foundation for protecting and restoring natural areas, species, and ecological processes, and for improving access to nature in all of Vancouver's neighbourhoods. It describes strategies to restore priority habitats such as forests, wetlands, and shorelines as part of a city-wide ecological network, to change the Park Board's operations to better support biodiversity, and to celebrate biodiversity as an important part of city life.

The report from the Vancouver Park Board and strategy can be found at: http://tinyurl.com/glbj8pp

2.2.2 Beaver Creek/Lake Restoration Project
Maria Egerton, Stanley Park Ecology Society (SPES)

Key Messages:

- Beaver Lake is filling in with sediment due to past clear-cut logging, construction of the causeway, walking trails and small dam on Beaver Creek, and introduction of invasive species such as reed canary grass
- Issues with beavers
- Impacts downstream on Beaver Creek
- Beaver Creek historically had coho and coastal cutthroat spawning in it (now one of only 4 spawning creeks in the City if Vancouver)
- Would like to restore access for salmonids (now only get part way up Beaver Creek)

Figure 1. Afternoon Field Trip into the Woods: Stanley Park 10 years after the storm. Bill Stephen, Forester with the Vancouver Park Board and workshop attendees

2.3 Workshop #2 Langley Stream, Riparian and Wetland Communities

2.3.1 Planning and Implementing a Habitat Project
Mike Pearson RPBio, Pearson Ecological

Key Messages:

- Gordon's Brook is a watercourse in Southeast Langley that was heavily impacted by agriculture (channelized, cleared to top of bank and riddled with drain tiles). Started a restoration project back in 2001 with a focus on Salish Sucker, but benefiting a number of other species
- Site Selection
    - Bigger, more degraded, close to good habitat to provide opportunity to link good habitat
- Understand the System: what species are present, what are the existing habitat features which can be incorporated into restoration project, what is the hydrograph and water quality like, soils, topography, and connection to other good habitat?
- Seven Design Principles
    - Take a broad view (multi-species approach) – over 50 SAR use riparian, stream and wetland habitat in the Fraser Valley
    - Incorporate existing features – it's cheaper, looks and functions more naturally
    - Harness natural processes – plant early successional pioneer species (e.g. willow, cottonwood, alder, birch)
    - Mimic Natural Landforms – avoid 'Trench-Bench-Berm' approach. Cut inside bank shallow, opposite bank steeper as would occur in a natural floodplain or meander. Leave riparian area soils rough and loose.
    - Cluster features at several scales – local variations in the site provide the highest habitat
    - Create a disturbance – (e.g. untethered log, moves and changes the area around it locally). A little bit of disturbance is okay and natural.
    - Embrace the random – most habitat is formed by random (stochastic) events. Floods, windstorms, etc. best restoration projects are made from a conceptual plan, followed by design build in the field by skilled practitioners.
- Permits and Notifications:
    - First Nations – consult with First Nations Bands with an interest in the site
    - Province of BC – Water Act (Section 9) changes in and about a stream, require permits for collection of any fish and wildlife managed by the province
    - Department of Fisheries and Oceans – need a fish collection permit for any fish salvages; regulated by the Fisheries Act
    - SARA Permit (Environment Canada) – required for fish salvages and/or habitat changes involving Critical Habitat (CH) for SARA listed species

    - Local Government – may get questions from the public if see an excavator working
    - Check with BC One Call (1-800-474-6886) for buried utilities
- May get a Letter of Advice from regulators which will advise on need for further permits for work is necessary
- Typical project progression:
    - Strip top soil and stock pile for later use
    - Rough excavation of channel
    - Detailed excavation/landscaping (bank slopes, variation in channel width)
    - Large wood – embed in bank so don't have to cable
    - Riffle construction
    - Streambed substrate placement
    - Top soil spreading
    - Seeding & planting
- Useful equipment:
    - 200 track excavator with thumb (10m reach)
    - 200 long reach excavator (20m reach) – useful in soft ground, reach above things
- Pre and post-construction monitoring (e.g. for Salish Sucker densities, planting survival)

2.3.2 Taking a holistic approach to wetland ecosystem restoration and stewardship
Monica Pearson RPBio, Balance Ecological

Key Messages:

- Identify the goals you want to achieve from a project:
    - Provide recovery habitat for endangered species X
    - Enhance wildlife biodiversity
    - Provide education
    - Increased knowledge of marsh restoration techniques
- Site Selection – need appropriate topography information (hydrology and soil)
    - Look at historical photos – drain tile may be indicated by dark spots
    - If you need a pond liner to hold water in the soil, it may be the wrong spot for a wetland
    - Look at a soil map or dig a test pit with an auger/excavator
    - If have time, install a water level logger
- Does the site need work?
    - Rehabilitation or enhancement of existing habitat features are preferable over starting from scratch
- Social Context – need community support, buy-in from public and stakeholders

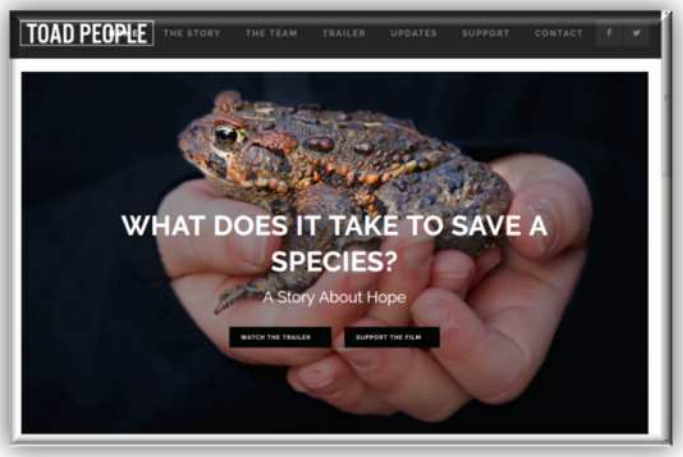
- What can you do with what is there?
    - How much will it cost to do something really good with a site?
    - Do you have the tools and resources to do a good job?
- Shallow marsh restoration
    - Remove drain tile
    - Let beavers do their thing
- Hydrology – important!
    - Make it so the water has somewhere to go, but make it work for you
    - Small gravel weirs to retain water in dry season, but that can overflow and release water during storm events
- Add habitat features
- Incorporate volunteers into the work – it helps gain community support and stimulates community ownership over the project
- Monitoring & Adaptive Management
    - key point: monitor whether the hydrology and vegetation work
    - plan for low budget & high budget monitoring
    - volunteers as citizen scientists and monitors, example in Aldergrove Regional Park the Langley Field Naturalists come to the site regularly and record birds; also send data to eBird
- Need to think more holistically about restoration, envision your project as a trampoline, can throw disturbance and it and it will bounce back, the more connections there are, the more resilient it is
- Partnerships: Metro Vancouver owned land around Aldergrove Regional Park, came to the table with some funders that wanted to restore the property
- Building resistance to Climate Change into a project:
    - hardening of the soils and weirs (so able to withstand more rain, storm events) to prevent erosion, and control water on site
    - Looking at movement of climate zones. Example Oregon Spotted Frog habitat is being created farther north than historical range, because in a few years that will equate to the habitat supporting existing populations right now (currently at the northern end of their range). Similar to assisted migration, just building it now for them to come to
- Forestry is talking about focusing on Douglas-fir rather than western hemlock as dominate species as conditions change (precipitation, temperature) due to climate change
- Many tools for preparing for climate change were first developed by the forest industry with the perspective that there is a need to "plan for the more extreme"
- Planning for Climate Change is already becoming more and more important. Can already see the results of poor planning in restoration (e.g. BC Hwy 1 Port Mann Bridge roadside plantings where they planted lots of cedars, a later successional species which are not doing well but the Sitka spruce and Douglas-fir is).

2.4 Updates from the Neighbourhood

2.4.1 Toad People Initiative and Preview
Chloe Speakman, Wilderness Committee

Key messages:

- Crowd-funding campaign to make a film about endangered species in BC
- Focus on the community of Ryder Lake that came together, with the help of the FVC and its partners, to help migrating toads
- Film will highlight the need for a stand-alone endangered species law in BC, the only province except Alberta not to have one



http://toadpeople.org/

2.4.2 Precious Frog
Monica Pearson RPBio

Key Messages:

- The Oregon Spotted Frog Recovery Team created "Precious Frog" as a way of branding the Oregon Spotted to provide awareness about this rarest of frogs in Canada
- It's Latin name literally means "Precious Frog"
- Just about to launch a website for the Precious Frog campaign where will post the latest information and updates on efforts to conserve and recover the Precious Frog

https://www.facebook.com/preciousfrog

Figure 2. Field Trip into the Wetland: From precious frogs to endangered fishes: Diversity by Design on the ground with Mike Pearson and Monica Pearson


Oregon Forestsnail, Gord Gadsden

3. Participant Feedback

Workshop participants were asked to complete a short survey after the sessions. The purpose of the survey was to help the SCCP and its partners receive feedback on the Diversity by Design approach and better understand the needs of attendees in respect to resources and tools for habitat restoration for species at Risk.

3.1 Attendance

Survey respondents represented a total of 5 different sectors based on the following categories:

Table 1. Workshop Attendees

Category	Number attending Workshop #1 (Forest Communities, Vancouver) (excludes workshop partners, speakers and organizers)	Number attending Workshop #2 (Aquatic Communities, Langley) (excludes workshop partners, speakers and organizers)	Number of workshop attendees responding to workshop survey (excludes workshop partners, speakers and organizers)
Academia (post-secondary educators)	1	0	0
Professional (biologists, foresters)	4	4	4
Students (post-secondary)	1	3	2
Stewardship (streamkeepers, naturalists)	4	10	12
Local Government	1	1	0
Total	11	18	18

3.2 Survey Questions

Attendees were asked six questions as part of the session feedback:

1. How did you hear about the workshop [Social media (i.e. Facebook), Direct email (i.e. SCCP), Indirect email (i.e. SCCP partner), Word of mouth, SCCP website]?
2. Have you participated in or implemented a project that includes habitat restoration that might benefit species at risk? In what municipality? What species at risk were involved?
3. Did the restoration work involve a stream, wetland, or forest community?
4. Do you feel you have the right tools to integrate species at risk into your restoration projects?
5. Do you feel Diversity by Design to be useful?
6. Would a workshop on restoring habitat for species at risk be useful to you or your organization?

3.3 Results[4]

A subsample of the total responses were analyzed, specifically how did target audiences hear about the workshops, have any participants integrated species at risk into their restoration activities, and do participants feel they have the right tools to integrate species at risk into restoration projects.

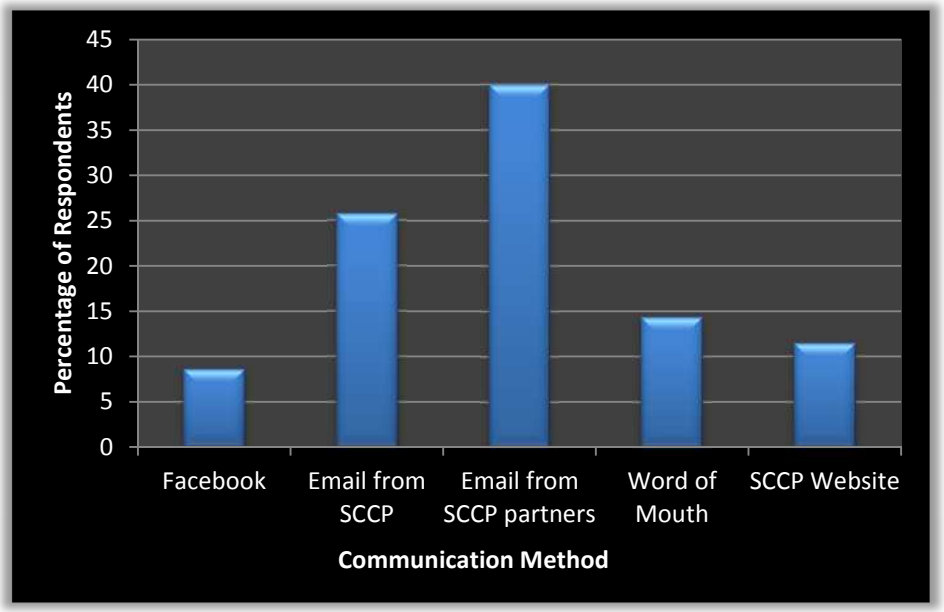


Figure 3. How participants heard about the workshop[5] N=35

[4] For a detailed breakdown of the survey data please see Appendix B

[5] For this event email appeared to be the most opportune method of advertising which was somewhat surprising but also suggests social media may need to be used more effectively.

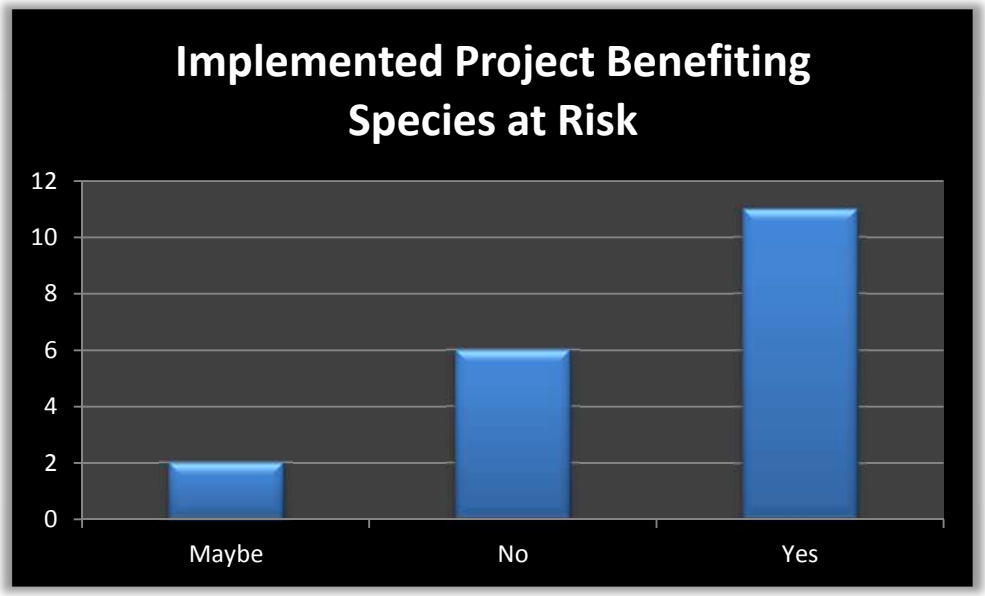


Figure 4. Have you participated in or implemented a project that integrated habitat restoration that might benefit species at risk? N=19[6]

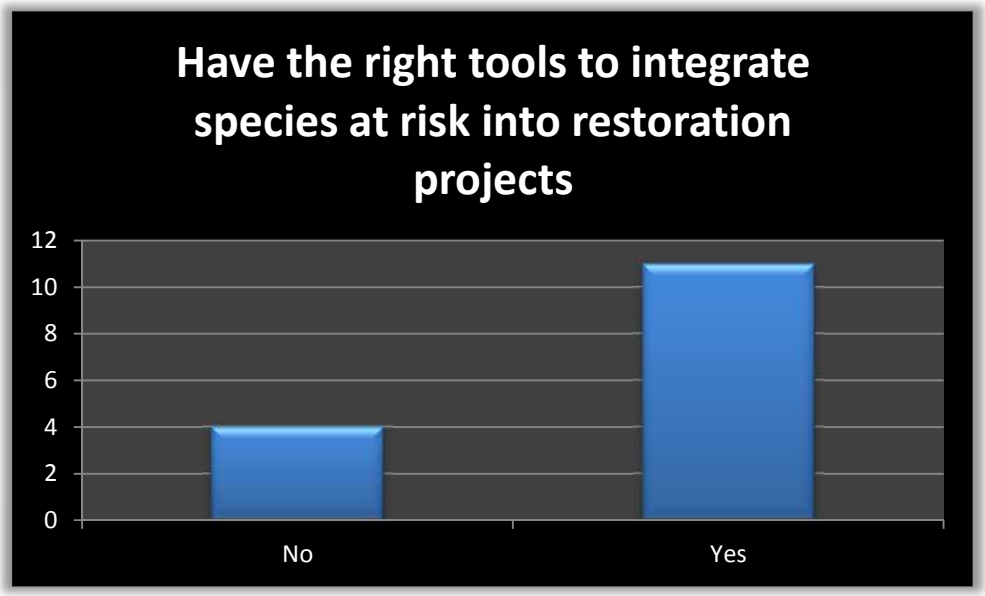


Figure 5. Do you feel you have the right tools to integrate species at risk into your restoration projects? N=15[7]

[6] Without knowing the details of individual projects some respondents may believe their projects would benefit SAR even if there is no definitive data or actual evidence that such benefits occurred. Most people asked a question of this nature would likely be biased to respond positively because they would hope that their project benefits a wide range of species regardless of whether they intended to or not.

[7] It is hard to assess whether respondents actually do have the right tools or simply believe they do without actually obtaining a breakdown of what tools and expertise they employ or actually have available to them. Certainly some respondents, including those with significant expertise, indicated they felt they lacked the resources or were unclear what is legally required, how to integrate approaches and where it is needed.

3.3.1 Sample Comments

While simple yes/no answers provide for an easy means to graph responses and gather quick stats, detailed comments can be very telling and useful in understanding the dynamics, needs and challenges occurring in SAR habitat restoration.

Examples include:

Question: What species at risk were involved?
Response: Restoration efforts (hopefully) indirectly have a positive effect on species at risk. Except Salish Sucker.

Question: Do you feel you have the right tools to integrate species at risk into your restoration projects?
Response: Yes. But it likely won't be quick or straight forward.
Response: No. But could form the basis of simple additions to projects we are working on that take little money but have great increase to ecological value.
Response: No. It is unclear what is legally required and how to integrate and where emphasis is due.

Question: Do you feel Diversity by Design to be useful?
Response: Yes. It is very helpful to have a central guide for restoration that lays out clear guidelines and covers a range of ecosystems in a multi-species approach.
Response: Yes. Excellent tool, particularly for non-professional organizations such as park associations
Response: Yes. Good to know about stewardship resources that clients may be working with. Also found it useful for personal professional development in an area I would like to work in more.

4. Next Steps

The workshops were the first step in launching the Diversity by Design toolkit to a broader public audience. The SCCP is looking to continue to utilize its evolving program streams, resources and expertise to engage other key audiences including First Nations and local government operational staff.

To complement Diversity by Design, the SCCP along with partners like the Fraser Valley Conservancy will continue to seek support and build capacity to address the gaps in species at risk recovery on the South Coast. This includes expanding the South Coast Endangered Species Finder App launched in 2015 and creating further linkages across areas of the region in respect to work with private landowners.


Great Blue Heron (fannini ssp.) Winnu Flickr

Appendices

Appendix A: Workshop Agendas

Workshop#1: Forest Communities 9:30am – 3:00pm, March 8, 2016 at the Stanley Park Ecology Society Offices (Stanley Park Pavilion)

9:30: Gathering time
10:00: Opening Welcome from the SCCP, Partners, and Introductions
10:15-11:45: Presentations
3 guest presenters, ~20 minutes each. Local forest ecosystem management specialists share their stories in exploring options and examples for taking a multi-species ecosystem-based approach to restoration.

Presenters:
SCCP/Patrick Lilley, RPBio, Kerr Wood Leidal: Diversity by Design from Concept to Guidance Document
Mike Coulthard, RPBio, RPF, Diamond Head Consulting: Approaches and principles for forest ecosystem restoration – from planning to implementation
Norm Caldicott, BSF, RPF, BCIT Forest and Natural Areas Management Program Instructor: Biodiversity and integrated thinking in forest ecosystem management.

11:45-12:00: Updates from the neighbourhood – Vancouver's biodiversity strategy and other big news for Stanley Park.
Maria Egerton - Stanley Park Ecology Society
Nick Page, MSc. - Vancouver Park Board
12:00: Lunch
1:00-3:00: Field trip into the woods
Bill Stephen, Vancouver Park Board: Stanley Park 10 years after the storm.
3:00 Wrap up and next steps

Workshop#2: Aquatic (Stream & Wetland) Communities 9:30am – 3:00pm, March 15, 2016 at the Aldergrove Athletic Park (Rotary Field House), Langley

9:30: Gathering time
10:00: Opening Welcome from the SCCP, Partners, and Introductions
10:15-11:45: Presentations
3 guest presenters, ~20 minutes each. Local aquatic ecosystem management specialists share their stories in exploring options and examples for taking a multi-species ecosystem-based approach to restoration.

Presenters:
Pamela Zevit, RPBio, SCCP: Diversity by Design from Concept to Guidance Document
Mike Pearson, PhD, RPBio, Pearson Ecological: Among the riffles: Approaches and Principles – your restoration project from planning to implementation.
Monica Pearson, RPBio, Balance Ecological: Taking a holistic approach to wetland ecosystem restoration and stewardship

11:45-12:00: Updates on Toad People and Precious Frog Initiatives
Chloe Speakman- Wilderness Committee
Monica Pearson – Precious Frog

12:00: Lunch
1:00-3:00: Field tour of critical habitat restoration projects at Aldergrove Regional Park
Mike Pearson and Monica Pearson: From precious frogs to endangered fishes Diversity by Design on the ground.

3:00 Wrap up and next steps

Appendix B: Survey Responses

Table 2 Survey response data workshop #1 Vancouver

Organization	Have you participated in or implemented a project that includes habitat restoration that might benefit species at risk?	In what municipality?	What species at risk were involved?	Did the restoration work involve a stream, wetland, or forest community?	Do you feel you have the right tools to integrate species at risk into your restoration projects?	Do you feel Diversity by Design to be useful?	Would a workshop on restoring habitat for species at risk be useful to you or your organization?	Questions/Comments for the SCCP?
Professional (Forester); Stewardship (Ecotrust Canada Volunteer)	No. In future!					Yes	Yes	A welcome rare workshop on forest restoration
Mossom Creek Hatchery	No					Yes		
Student- BCIT Ecological Restoration; Stewardship	Maybe	Surrey		Stream and Forest	Yes	Yes	Yes	
Burke Mountain Naturalists, Colony Farm Park Association	Yes	BC Hydro Wastershed Compensation Program	Various	Stream, Forest and Wetland	I think Diversity by Design will help us to conquer that question. The SCCP seems to be the right organization.	Yes. Looks very useful - I'll be discussing it with the Park Association and Metro Vancouver	Yes	Great presentation! Keep up the good work!
BA Blackwell &	No		Some projects I	N/A	Yes	Yes. Good to know	No	

Associates; Professional			work on have SAR limitations, but are not specific restoration			about stewardship resources that clients may be working with. Also found it useful for personal professional development in an area I would like to work in more.		
Kerr Wood Leidal; Professional	Yes	Surrey	Pacific Water Shrew, Salish Sucker, Northern Red-legged Frog	Stream, Forest and Wetland	Yes	Yes	Yes	
BCIT instructor; professional	Yes	Burnaby, Surrey, Coquitlam	Pacific Water Shrew	Stream, Forest and Wetland	No. It is unclear what is legally required and how to integrate/ where emphasis is due.	Yes. Very well designed and readable.	Yes. Parse into habitat and species units. Focus on most important.	Thank you. Please keep me in the loop.

Table 3 Survey Response Data Workshop #2 Langley

Organization	Have you participated in or implemented a project that includes habitat restoration that might benefit species at risk?	In what municipality?	What species at risk were involved?	Did the restoration work involve a stream, wetland, or forest community?	Do you feel you have the right tools to integrate species at risk into your restoration projects?	Do you feel Diversity by Design to be useful?	Would a workshop on restoring habitat for species at risk be useful to you or your organization?	Questions/Comments for the SCCP?
Stanley Park Ecology Society	Yes, but not me directly	Metro Vancouver	It had a biodiversity focus. Still doing inventory but there is a bog habitat restoration project ongoing to complement restoration at Beaver Lake.	Bog	Yes. But it likely won't be quick or straight forward.	Yes. Absolutely	Yes. Definitely	
A Rocha	Yes	City of Surrey, White Rock, Township of Langley		Stream and Wetland	Yes	Yes	Yes	
Student- BCIT (Ecological Restoration Program)	Maybe	Surrey		Stream, Forest, Wetland	Yes	Yes. Good design tips	Yes	
Stanley Park Ecology Society	Yes	City of Vancouver (Stanley Park)	Pacific Water Shrew	Stream	Yes	Yes	Yes	Great workshop - very informative
A Rocha	Yes	City of Surrey, Township of Langley	Northern Red-legged Frog	Wetland	Yes	Yes. It is very helpful to have a central guide for	Yes	

						restoration that lays out clear guidelines and covers a range of ecosystems in a multi-species approach.		
NATS Nursery	Yes	clients such as Metro Vancouver, A Rocha, LEPS, TWU	Northern Red-legged Frog; Propertius Duskywing	Stream, forest and wetland	Yes	Yes	Yes	Yes
Burke Mountain Naturalists, Colony Farm Park Association	Yes	BC Hydro Wastershed Compensation Program	Various	Stream, forest and wetland	Yes. With the caveat that more knowledge is always required	Yes. Excellent tool, particularly for non-professional organizations. E.g.: park associations	Yes. Many people tend to be intimidated by on-line resources. In-person presentations are very useful.	Great job!
Mossom Creek Hatchery	No					Yes	No. Our projects are very small scale	
Pacific Streamkeepers Federation	Yes, as a community volunteer	North Vancouver	Northern Red-legged Frogs, salamanders, salmon	Stream	We worked with people who knew the tools	Just reviewing it now	will put forward for next September workshop topic	Will link this to the Streamkeepers modules resource pages where most applicable
Langley Environmental Partners Society	No	Langley	Restoration efforts hopefully indirectly have a positive effect on species at risk. Except Salish Sucker.	Streams and riparian areas	No. Simple additions to projects LEPS is working on that take little money but have great increase to ecological	Sorry I haven't looked at it but very confident that it will have a great deal of positive changes to our work	Yes. Our AGM is April 15th - ish and our presenter had to cancel :)	Many thanks for all your work and dedication. Inspiring!

					value.			
Wilderness Committee	No						No	Thanks so much for having me! I'm happy to connect with your work
Maple Creek Streamkeepers	Yes. Currently and ongoing	Port Coquitlam	Assessing currently	(urban) Stream and riparian area	Yes. Investigating further as project is taking place this year	Yes. Electronic booklet is a great resource	Yes. SEP (Salmon Enhancement Community Workshop - PSF) conference - held every 2 years	Thank you for planning this and providing resources (for all presenters!)