

We Need the Needles: Coordinating Action to Conserve 5-Needle Pine Forests in the Crown of the Continent



Photos courtesy of the National Park Service

Final Workshop Report Crown Managers Partnership Annual Forum

March 15-17, 2016 – Fernie, British Columbia

For all supporting materials, please see workshop website:

<http://crownmanagers.org/2016-forum/>

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Report Date: May 13, 2016

Organized by:



This report was written by Regan Nelson. All errors and omissions are hers alone. All pictures included in this workshop report were taken by Regan Nelson, unless otherwise attributed.

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EXECUTIVE SUMMARY

The “We Need the Needles: Coordinating Action to Conserve 5-Needle Pine in the Crown of the Continent” workshop was held at the Crown Managers Partnership 16th Annual Forum in Fernie, British Columbia from May 15-17, 2016. This workshop was the fourth in a series of workshops organized by the Crown Adaptation Partnership (CAP), and was co-sponsored by the Whitebark Pine Ecosystem Foundation (U.S.) and the Whitebark Pine Ecosystem Foundation of Canada.

Eighty-seven people participated in the workshop, representing 43 different federal, provincial, state, municipal, tribal and First Nation governments, as well as conservation organizations, universities, industry and communities. The workshop focused on four objectives:

- Deliver best available science and data products on the climate adaptation strategies and tactics necessary to maintain 5-needle pine in the CCE in an era of rapid climate change;
- Discuss existing challenges and/or barriers that may be impeding 5-needle pine restoration, and develop recommendations to address these issues;
- Catalyze a formal CCE-wide working group whose purpose is to promote the long-term viability of 5-needle pines in the CCE by sharing information, leveraging capacity and resources, and promoting 5-needle pine protection and restoration; and
- Initiate a process to develop a CCE-wide 5-needle pine restoration strategy that identifies and prioritizes the type, amount and location of restoration activities, protection measures and monitoring that are necessary to restore 5-needle pine in the CCE.

The workshop kicked off with a focus on the ecological and cultural significance of five-needle pine forests in the Crown. After a blessing by Wayne Louie, member of the Lower Kootenay Ktunaxa Nation, Diana Tomback gave a keynote presentation on the ecological role and value of five-needle pine. Dr. Tomback was followed by an inter-tribal panel of members of the Confederated Salish and Kootenai Tribes, the Blackfoot Tribe, the Ktunaxa Nation and the Kainai Nation, who each shared stories of their nation’s cultural ties to five-needle pine species, and all discussed the extensive interconnections between whitebark pine forests and their cultural identity, heritage, spirituality, and language over long periods of time in this landscape.



"We Need the Needles" workshop participants. Photo credit: Ian Dyson

Workshop participants were then treated to a series of presentations that delivered best available science and data products on climate change adaptation strategies for five-needle pine. Cyndi Smith covered the status, trends and restoration approaches to five-needle pine in the Crown, Shannon Blackadder presented new data products depicting fine-scale whitebark pine distribution throughout the Crown, and Bob Keane gave an overview of the forthcoming climate change adaptation companion document to the 2012 Whitebark Pine Range-Wide Restoration Strategy and its implications for the Crown. On the final day of the workshop, Ellen Jungck presented an overview of the structure and function of the Greater Yellowstone Coordinating Committee's Whitebark Pine sub-committee, and shared lessons learned and ideas for workshop participants to consider in their discussions. All presentations are available for viewing at: <http://crownmanagers.org/2016-forum/>

Workshop participants then delved into a series of small and large group discussions to address the remaining workshop objectives. Through skilled facilitation, earnest discussion, and much shared passion, workshop participants identified a set of seven consensus-based workshop outcomes that, if implemented, will significantly enhance the likelihood of five-needle pine persistence in the Crown of the Continent landscape. The Crown Adaptation Partnership will provide support to workshop participants and other interested individuals to advance implementation of the following seven outcomes:

OUTCOME #1: CATALYZE A FORMAL “HIGH-FIVE” CROWN-WIDE WORKING GROUP: Workshop participants agreed to establish a formal “High-Five” Crown-wide working group, perhaps as a sub-committee of the Crown Managers Partnership. The purpose of the working group would be to advance collective efforts to effectively prioritize, monitor, conserve, and restore five-needle pine in the Crown. The working group would house the various “task forces” that will deliver on other workshop outcomes. The working group will include all jurisdictions and stakeholders, and will weave cultural, ecological, economic and political factors together from the start.

OUTCOME #2: DEVELOP A MITIGATION STRATEGY AND BEST MANAGEMENT PRACTICES TO AVOID DEGRADATION OR LOSS OF FIVE-NEEDLE PINE: While five-needle pine is not targeted for harvest, industrial development does lead to the loss and degradation of five-needle pines. Where mitigation is required, it is typically done ‘on-site’ of the industrial footprint, which may or may not be the most effective way to mitigate for impact. Workshop participants expressed an interest in developing a unified mitigation strategy that could direct mitigation activities to pre-identified priority areas, even if this was ‘off-site’ from the permitted activity. Participants also discussed the need for detailed scientifically-based best management practices when working in areas where pines are present. Workshop participants also discussed in great length how to ensure the new Canadian whitebark pine federal recovery rule will lead to effective conservation and mitigation, and suggested developing a training webinar targeted at industry and permit reviewers to explain the obligations of the critical habitat rule to support effective compliance.

OUTCOME #3: LAUNCH A CROWN-WIDE MONITORING AND INVENTORY DATABASE: A clear and detailed understanding of where whitebark pine and limber pine occur across the Crown, as well as their condition (tracked through time), is crucial to inform an effective landscape-scale restoration action plan. Currently, this knowledge is fragmented: some jurisdictions have good occurrence and condition data, and some, including private lands, have nearly none at all. Existing data is better for whitebark, but very limited for low-elevation limber pine. Workshop participants agreed that a Crown-wide common

database of stand-level occurrence was necessary to inform a Crown-wide restoration strategy. Participants also expressed a desire for an information hub that could house the following types of information: case studies of restoration successes, failures, effectiveness levels and lessons learned; best management practices for operating in 5-needle pine; standard inventory and mapping protocols; and results of Crown-wide mapping products. Participants also discussed the importance of expanding the footprint of long-term monitoring across the landscape, and to focus on the collection of absence data.

OUTCOME #4: DRAFT (AND IMPLEMENT) A CROWN-WIDE RECOVERY PLAN: Whitebark and limber pine are in peril, and securing these species ability to persist across the Crown will require a concentrated and coordinated set of restoration actions. Workshop participants expressed a desire for a Crown-wide Recovery Plan that would prioritize areas for conservation and restoration, incorporate clear guidelines for restoration where applicable (e.g. related to highly protected areas, appropriate use of fire, etc.), identify mechanisms for sharing resources, opportunities for new funding, and connect to broader scale restoration priorities beyond the Crown.

OUTCOME #5: DEVELOP RECOMMENDATIONS FOR 5-NEEDLE PINE RESTORATION IN HIGHLY PROTECTED AREAS: A large amount of whitebark pine occurs in highly protected areas (in the U.S., approximately 50% of whitebark pine occurs in designated Wilderness areas). The protection level afforded to these areas can restrict or even prohibit certain restoration activities. Workshop participants discussed developing guidance for how restoration strategies in highly protected areas might best fit into a landscape scale strategy, and how existing decision-making frameworks can guide thinking about restoration in protected areas where the default alternative is for managers not to intervene, but certain thresholds or triggers for action might be developed and monitored to determine if action is truly necessary to save the species.

OUTCOME #6: DEVELOP RECOMMENDATIONS TO GUIDE PRO-ACTIVE FIRE MANAGEMENT IN FIVE-NEEDLE PINE FORESTS: Fire has both positive and negative implications for whitebark and limber pine. Regeneration of these species is closely linked to newly burned areas, and fire is important for removing competitors. However, higher-intensity fires can kill five-needle pines, which poses a threat, particularly to important individuals (e.g. Plus trees, reproductively mature trees) and stands (e.g. climax stands). Wildland fire use and prescribed fire are important restoration tools, particularly in the Crown given anticipated increases in productivity (leading to more competition) and increases in the size and intensity of fires. Workshop participants identified several needs, including the need to engage fire managers directly in five-needle pine restoration objectives, the need to develop common best practices for using/fighting fire in the context of five-needle pine forests, and the need to accelerate post-fire monitoring using standardized monitoring protocols.

OUTCOME #7: DEVELOP A MULTI-FACETED COMMUNICATIONS STRATEGY TO RAISE AWARENESS AND SUPPORT FOR FIVE-NEEDLE PINE RESTORATION AND CONSERVATION: Despite the imperiled status of five-needle pines in the Crown, these species do not command the same level of support and priority of other imperiled species. Part of what will enable more vigorous conservation and restoration of these species is increased awareness and support from the public, policy makers, decision makers, industry and community stakeholders. Workshop participants identified the need for a multi-faceted communications strategy that would identify the key audiences and messages, with the goal of increasing the pace and scale of restoration across the Crown. Participants also enthusiastically

supported developing a citizen science initiative, with a smart-phone app, that could contribute data on location and health of pines, particularly on private lands.

A number of individuals at the workshop have stepped up to provide leadership for moving each of these outcomes forward, and post-workshop discussions are already underway. If you would like to learn more about the workshop itself, or if you would like to engage directly in the efforts to advance these outcomes, please contact Regan Nelson (regan@crowncconservation.net).



Workshop participants during small-group discussions Photo Credit: Lisa Talavia-Spencer

WORKSHOP INTRODUCTION & OBJECTIVES

The “We Need the Needles: Coordinating Action to Conserve 5-Needle Pine in the Crown of the Continent” workshop was held at the Crown Managers Partnership 16th Annual Forum. This workshop was the fourth in a series of workshops organized by the Crown Adaptation Partnership (CAP), which is a unique partnership between the Crown Managers Partnership (agency managers and science organizations), the Crown Conservation Initiative (a collaboration of environmental conservation groups that work in the Crown), the Northern Rockies Adaptation Partnership (a project of the US Forest Service), and The Wilderness Society. Together, CAP brings together the expertise of a broad suite of government and conservation representatives, tribes and First Nations, universities, and community stakeholders to implement coordinated climate change adaptation strategies across the Crown of the Continent ecosystem based on the best available science.

CAP was formed in 2013 with the support of the Adaptive Management Initiative of the Roundtable on the Crown of the Continent. CAP held its first workshop in March, 2014 as part of the Crown Managers Partnership 13th Annual Forum. At that workshop, diverse perspectives from a variety of agencies, organizations, Tribes and First Nations, universities, industry and communities identified a set of conservation targets that were urgently threatened by climate change, and which could benefit from coordinated action across jurisdictions. Conservation and restoration of whitebark pine and limber pine emerged as an urgent priority. (A full report from this initial workshop is available at: http://crownmanagers.org/storage/FINAL%20REPORT_Taking%20Action%20on%20Climate%20Change%20Workshop_July%202014.pdf)

This workshop, “We Need the Needles: Coordinating Action to Conserve 5-Needle Pine in the Crown of the Continent” is a direct response to an identified need to seek ways in which all partners in the region could more effectively coordinate, collaborate and implement restoration and conservation of the imperiled five-needle pine forests in the Crown of the Continent. The workshop, hosted by the Crown Adaptation Partnership entities, was co-sponsored by the Whitebark Pine Ecosystem Foundation (based in the U.S.) and the Whitebark Pine Ecosystem Foundation of Canada.

The Great Northern Landscape Conservation Cooperative shares a priority on restoring and conserving whitebark pine, and generously provided funding to support the staff time required to organize this workshop. Alberta Environment & Parks paid for the room rental for the duration of the conference. And the Glacier National Park Conservancy generously provided for a social event at the Fernie Museum for workshop participants.

The workshop objectives were crafted by an inter-jurisdictional planning committee, and guided the outcomes sought by this transboundary team (see Workshop Acknowledgements for a list of individuals who comprised this team).

The workshop objectives were:

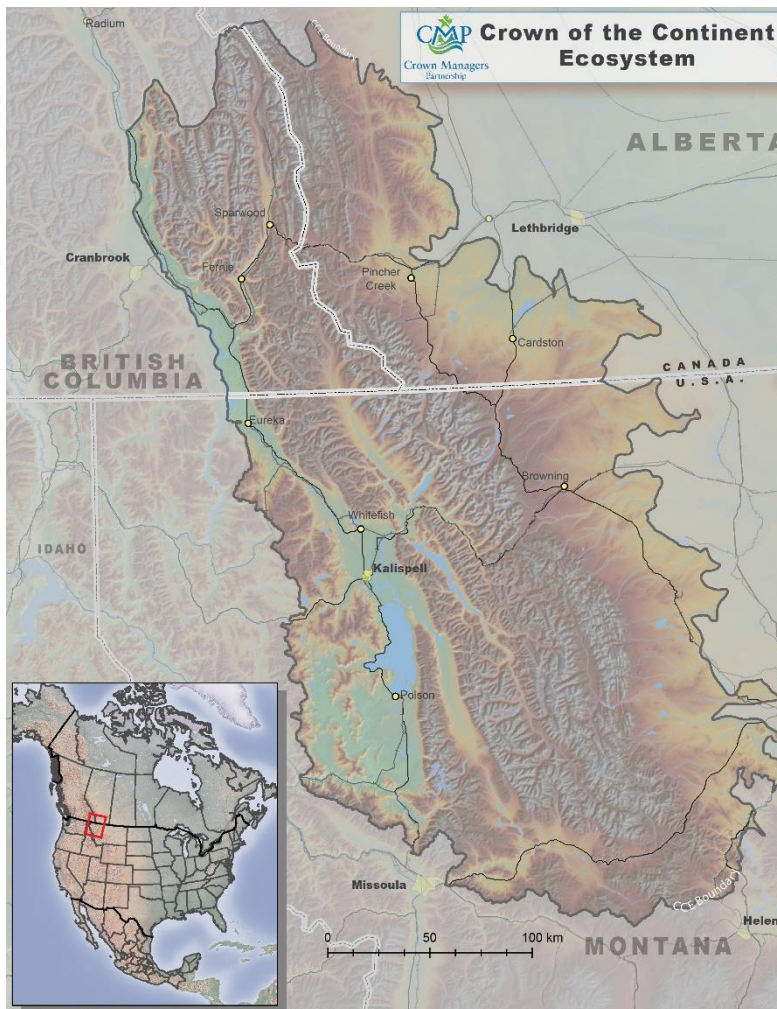
- Deliver best available science and data products on the climate adaptation strategies and tactics necessary to maintain 5-needle pine in the CCE in an era of rapid climate change;
- Discuss existing challenges and/or barriers that may be impeding 5-needle pine restoration, and develop recommendations to address these issues;

- Catalyze a formal CCE-wide working group whose purpose is to promote the long-term viability of 5-needle pines in the CCE by sharing information, leveraging capacity and resources, and promoting 5-needle pine protection and restoration; and
- Initiate a process to develop a CCE-wide 5-needle pine restoration strategy that identifies and prioritizes the type, amount and location of restoration activities, protection measures and monitoring that are necessary to restore 5-needle pine in the CCE.

The workshop participants are listed in Appendix 1, and the full workshop agenda is available in Appendix 2. This report summarizes the presentations, discussions, and outcomes that emerged from this workshop. Raw notes capturing the discussion, comments and break-out groups reports from the workshop are not included in this summary report, but can be provided upon request. Please direct such requests to the Crown Managers Partnership Secretariat, Sasha Harriott (crownmanagers@gmail.com).

WELCOME AND OPENING REMARKS

Workshop participants were welcomed in prayer by **Wayne Louie**, member of the Lower Kootenay



Map provided courtesy of the Crown Managers Partnership

Ktunaxa Nation, Creston. Wayne is a master canoe builder who is passing on amongst his people the art of constructing traditional white pine Sturgeon-nosed canoes – a craft and cultural tradition that he learned from his elders. Wayne showed a short video featuring his experience teaching young people how to build a traditional white-pine canoe: <https://vimeo.com/110410378>

Ian Dyson (Alberta Environment & Parks) provided a context-setting introduction, outlining the ecological significance and jurisdictional and ecological complexity of the Crown of the Continent Ecosystem, the trans-boundary environmental interdependencies that brought the Crown Managers Partnership (CMP) together, and the ecological stressors that are impacting the region. Ian also discussed the relationship between the CMP and synergies with other Crown-wide, sub-regional/watershed and meso-regional initiatives. The history and

current composition of the CMP partnership was outlined along with the CMP's major program – the Transboundary Conservation Initiative -- which is seeking to provide assurance of desired transboundary environmental outcomes for identified conservation priorities such as aquatic invasive species and landscape intactness. Recently the CMP has entered into partnership with the Crown Conservation Initiative and The Wilderness Society – A Crown Adaptation Partnership (CAP) that is addressing a suite of climate change adaptation conservation priorities. CAP is currently actively working on native salmonids and non native invasive plants and also hope to address meso-carnivores and fire in mixed-severity fire regimes. The CMP is pleased and proud to host a CAP workshop on 5-Needle Pines as the focus for the 2016 Forum.

See Ian's full presentation at: <http://crownmanagers.org/storage/CMP%20Forum%202016-%20Ian%20Dyson%20sm.pdf>

OBJECTIVE #1: DELIVER BEST AVAILABLE SCIENCE AND DATA PRODUCTS ON THE CLIMATE CHANGE ADAPTATION STRATEGIES AND TACTICS NECESSARY TO MAINTAIN 5-NEEDLE PINE IN THE CCE IN AN ERA OF RAPID CLIMATE CHANGE.

The workshop began with a series of presentations from leading researchers and tribal and First Nations leaders, helping workshop participants understand 1) the ecological role and importance of five-needle pine; 2) the traditional and cultural importance of five-needle pine forests; 3) the status, trends and restoration needs of five-needle pine; 4) the distribution of whitebark pine across the CCE; 5) the expected impacts of climate change on five-needle pine forests, and 6) recommendations for how these impacts might lead to modifications of existing restoration approaches (e.g. what/where/when/how) of five-needle pine forests.

Diana Tomback (Whitebark Pine Ecosystem Foundation) began by providing an overview of the forest health challenges facing five-needle pine, including invasive pests, plants, and pathogens, as well as climate change. She warned the issues facing five-needle pine are a harbinger for forest health challenges we are likely to see throughout western forests in the future. She covered the ecology, distribution, ecological niche, and ecosystem services provided by five-needle pine forests, as well as the unique forms and functions of whitebark and limber pine spp. She noted whitebark and limber pine provide food for at least 13 species of birds, 8 species of small mammals, and 3 species of large mammals, including the endangered grizzly bear. Five-needle pine, as high-elevation species, also anchors mountain snowpack, an important function in an era of rapid climate change. Diana noted whitebark is listed as endangered under Canada's Species At Risk Act, and is a candidate species for listing under the U.S. Endangered Species Act. Limber pine is

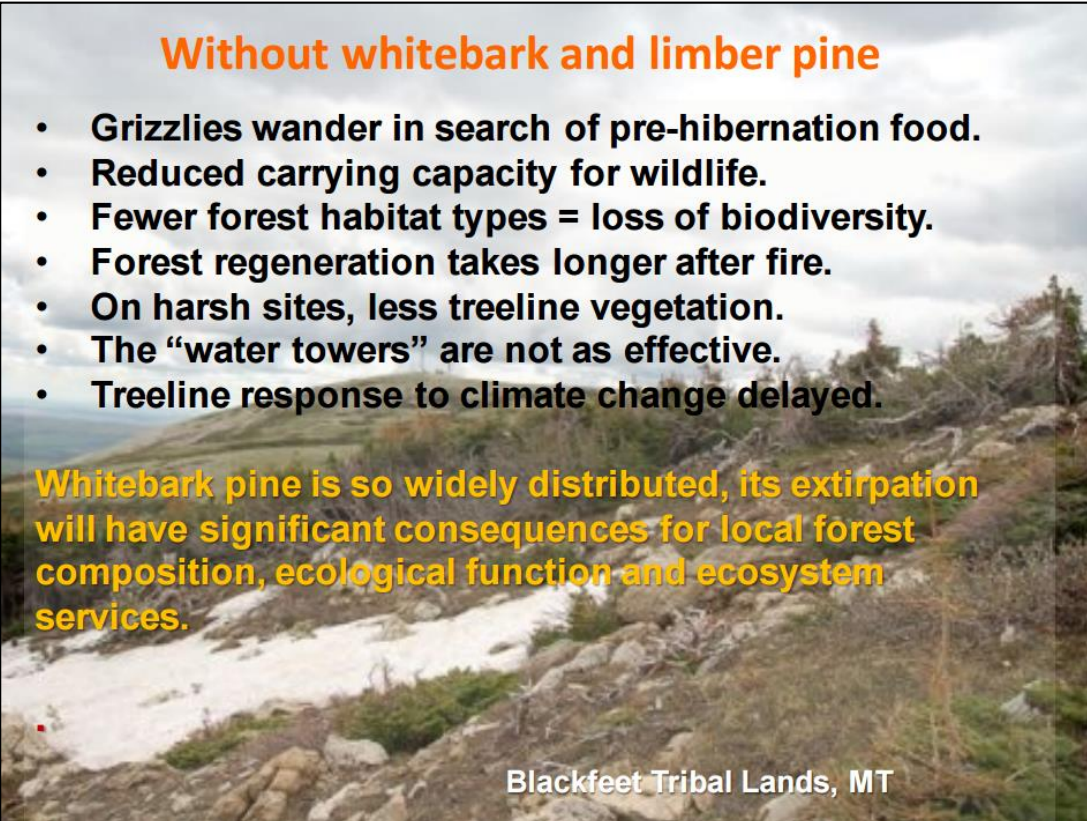


Diana Tomback

currently being evaluated for listing in Canada, and is considered endangered in the province of Alberta. She discussed the shared threats to both species being the continued expansion of white pine blister rust, the past and recent large scale outbreaks of mountain pine beetle, altered fire regimes (resulting in whitebark pine being shaded out) and climate change, which produces drought stress and mortality, and alters pine distributions. She detailed how restoration activities speed up natural selection by selecting for and planting blister rust-resistant seedlings. This requires climbing trees in the spring to cage cones (for protection from predators) and then re-climbing them in the fall to harvest cone seeds, using these seeds to grow seedlings in a nursery, screening seedlings for rust resistance, protecting resistant seed source trees from mountain pine beetles, planting seedlings, and identifying new seed sources throughout the range. She warned that restoration requires a commitment for generations, and occurs most successfully through partnerships.

See Diana's full presentation at:

http://crownmanagers.org/storage/Restoring%20the%20Crown%20Jewels%20Crown%20Partnership%2003_15_16-Diana%20Tomback%20copy.pdf



Without whitebark and limber pine

- **Grizzlies wander in search of pre-hibernation food.**
- **Reduced carrying capacity for wildlife.**
- **Fewer forest habitat types = loss of biodiversity.**
- **Forest regeneration takes longer after fire.**
- **On harsh sites, less treeline vegetation.**
- **The “water towers” are not as effective.**
- **Treeline response to climate change delayed.**

Whitebark pine is so widely distributed, its extirpation will have significant consequences for local forest composition, ecological function and ecosystem services.

Blackfoot Tribal Lands, MT

Slide from Diana Tomback's presentation

Mike Durglo (Confederated Salish and Kootenai Tribes) welcomed an inter-tribal panel of tribes and First Nations from the Crown of the Continent to talk about their traditional ecological knowledge and cultural associations with five-needle pine forests. Mike noted that the CSKT has developed a strategic climate change adaptation plan that highlights whitebark pine restoration as a priority. He noted that



From left to right: Mike Durglo (CSKT), Wayne Louie (Ktunaxa Nation), Tony Incashola Sr (CSKT), Terry Tatsey (Blackfeet Tribe) and Mike Bruised Head (Kainai Nation)

Chief Sielu said that all things are connected, and what befalls those things, befalls us. It's our responsibility to care for those things, and to speak for those things that cannot speak for themselves. Mike reminded us that the ancestors said that they could hear the plants and animals speaking, and we're not so good at that anymore. He noted that we all have a responsibility to take care of one another and all things.

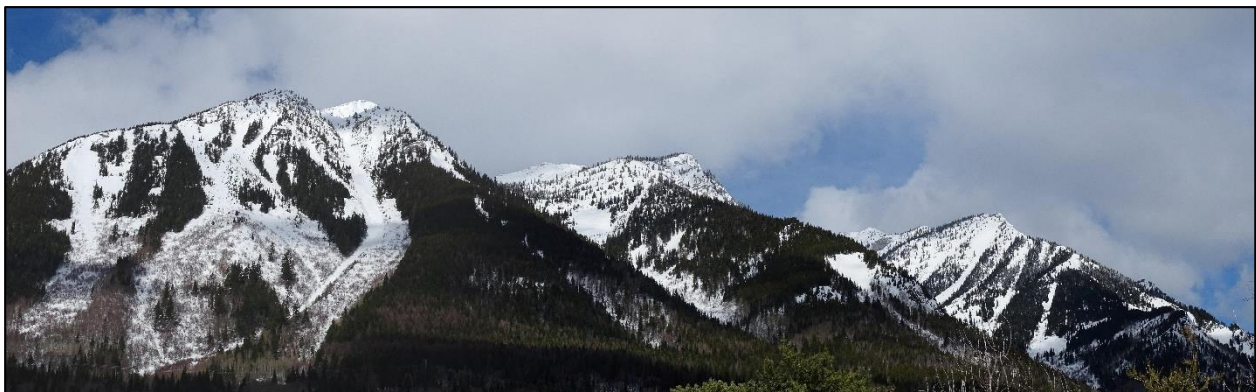
Wayne Louie (Ktunaxa Nation) told the audience that white pine has been with the Ktunaxa Nation for time immemorial. Before the Europeans came, the Ktunaxa used white pine canoes on all of the rivers and streams, it was the main form of transportation. The white pine means so much to the Ktunaxa people. Wayne said the Ktunaxa language, the sturgeon nose canoe, these are what create the Ktunaxa people, they are the keeper of Ktunaxa heritage, spirituality, identity and language. Last year, Wayne went on a road trip to harvest white pine material to make a canoe for Ktunaxa children. He went all the way down to Sandpoint, Idaho, and the white pine was spotty – same with Coeur d'Alene. The only place he found white pine in Montana was in someone's yard and another up high but it was dead. So, he couldn't find a white pine to get out of Montana. Finally found some over near Libby. Wayne does this inventory every year, and is dismayed at how hard it is to find healthy white pine on the landscape. We have a lot of work to do to save this species.

Tony Incashola, Sr (Confederated Salish and Kootenai Tribes) began by saying "Before we were here, the animals were here, and they took care of everything for us. They prepared this place and this land for us.

And when we got here, we were told that the animals could not speak with one another, we were told that we needed to speak for the animals. And we learned how to take care of one another from the animals.” Tony remembered when he was a child that he was given whitebark pine nuts to eat. They were considered a treat, and the children weren’t allowed to eat many at a time because they were so rich. That is why the grizzly bears love them. Tony shared that when he was younger, he thought the elders would always be around to take care of things, but now they are gone and he is the elder, and he urged the audience to figure out what needs to be done to ensure whitebark and limber pine can survive hundreds of more years. Tony said he was glad to see everyone coming together to find solutions, which is how we will succeed.

Terry Tatsey (Blackfeet Nation) said the Pikuni peoples’ origin stories are tied to the landscape. What some call the ‘Continental Divide’, the Pikuni refer to as the backbone of the earth. Terry said that when he was invited to give a presentation on whitebark pine, he had to think hard about it, but he remembered that after the starvation period of the 1870’s and 1880’s, the elders said the people had to move back to the mountains, telling them “the mountains will take care of you”. Terry’s ancestors carried the back fat of the animal, and the dried protein, crackers and bread. If they ran out of back fat, they could eat the whitebark nuts, which provided them with balanced nutrition. Terry also remembered the caves up in the mountains that have pictographs; the people who made those pictographs had to have food resources available to them, which may have been the nuts. In 2000, Terry helped Glacier National Park replant 6,000-10,000 whitebark pine seedlings. He asked them why it was so important, and they talked about blister rust. Terry said that we all have a responsibility for speaking for those who can’t speak for themselves, and doing for those who can’t do for themselves.

Mike Bruised Head (Kainai Nation) began by speaking the native word for “whitebark pine seed”. He said he remembers hearing his great grandparents, who were born in the 1880’s, use this word, but that it had been so many years since he heard it, it took a long time for him to remember the word. Mike said he remembers his great grandmother boiling whitebark pine seeds, but noted that you can’t boil the seeds too long because they are so strong. The tea was used as a medicine for healthy bones and for hair. Mike said his grandfather told him that when you meet people in the Indian world, it’s not coincidence, it’s meant to be. There’s a meaning and a reason why you met those people. Mike said, “It’s why we come to these crazy conversations.” Mike said the Kainai Environmental Protection Agency staff have had two tribal sessions, and want to protect their lands next to Glacier and Waterton National Parks. They are going to map out to see if they have any whitebark pine left, but now they are going to use science to see what is left, because nobody goes up there and brings seeds down anymore.



Fernie Ski Hill. Photo Credit: Ian Dyson



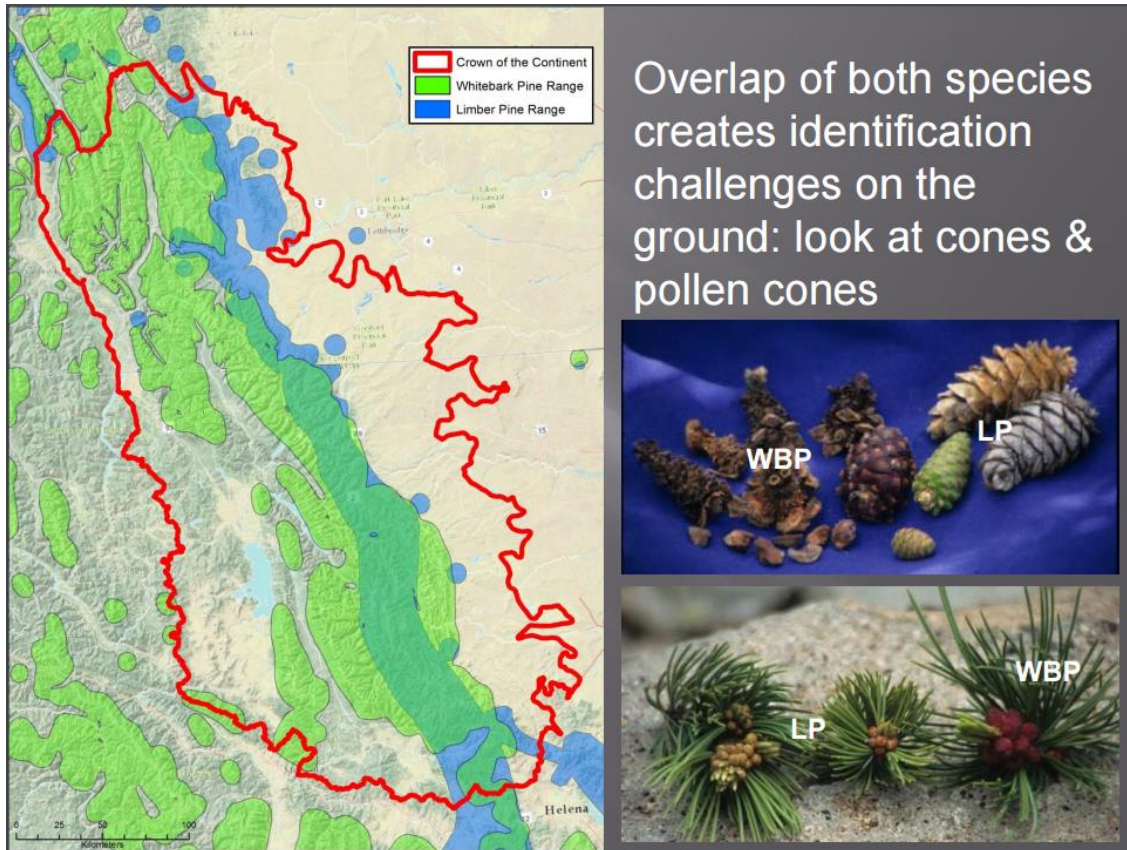
Cyndi Smith

Cyndi Smith (Waterton Lakes National Park, Scientist Emeritus) reviewed the distribution, health status and trend of five-needle pine in the Crown, as well as threats from human development and restoration activities in date. She emphasized that limber pine is near the northern limits of its range in the Crown, and therefore the Crown is particularly important for Canada's limber pine. For whitebark, the Crown is the center of the specie's north-south distribution (range maps available at www.whitebarkfound.org). Cyndi said that the Waterton-Glacier International Peace Park has the highest levels of blister rust infection in the Canadian range, with ~80% infection levels for both species.

Cyndi stated that the existing threats from human development to five-needle pine include logging, oil, gas and coal mining, wind farms (that may be developed on ridges that host limber pine), recreational development, ski areas, and even heli ski companies (one case where high-elevation whitebark pine was cut down for a helicopter landing site). She reviewed the three major

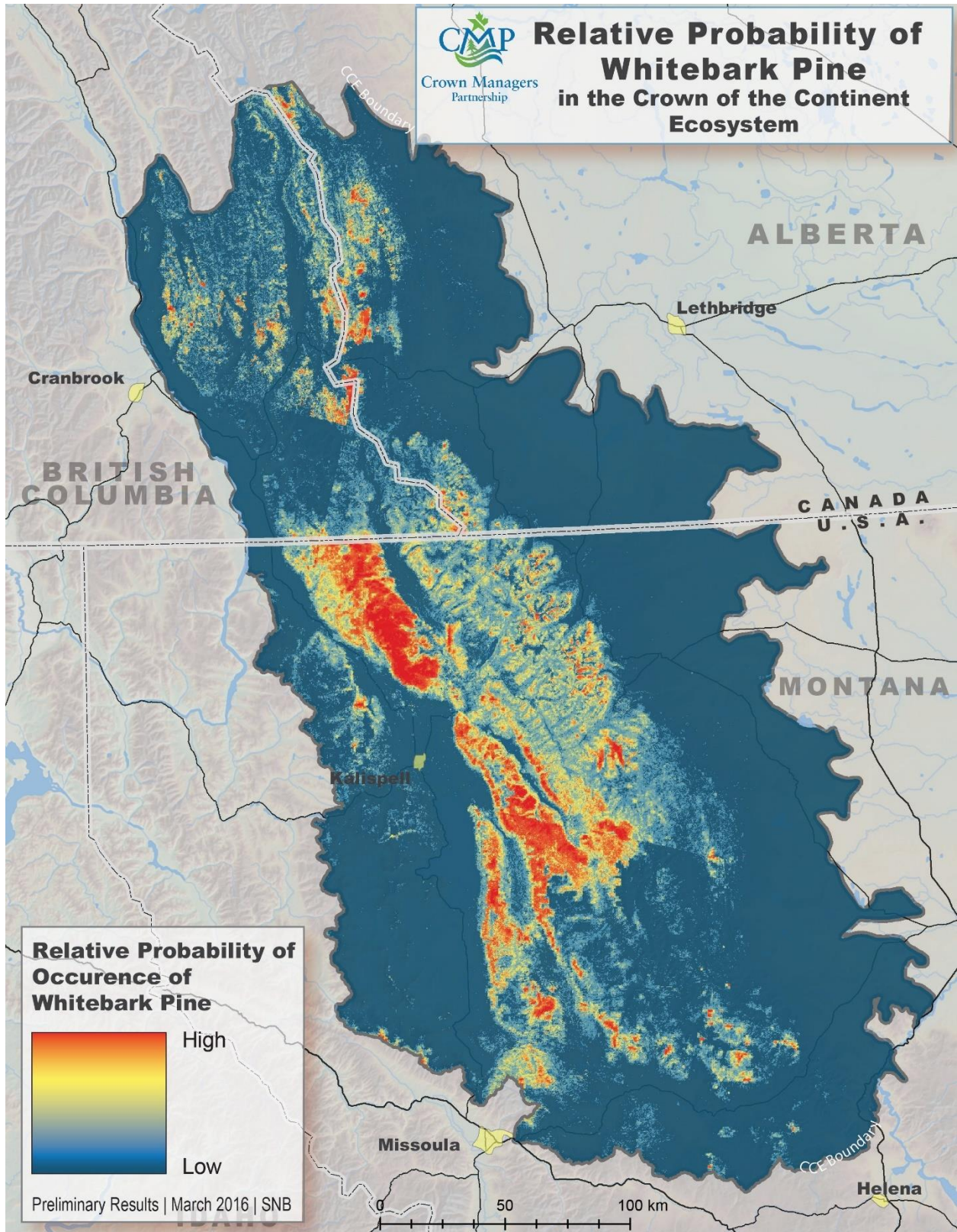
existing restoration strategies which include 1) identifying Plus trees (those trees that appear healthy in stands of high blister-rust mortality), and then protecting those trees from mountain pine beetle, caging their cones, extracting their seeds, collecting their scion and pollen, and then formally screening their seedlings for rust resistance, 2) using fire (either prescribed or managed wildfire) to reduce competition from other conifers, enhance the seed bed, and form good places for new planting, and 3) planting potentially rust-resistant seedlings, experimenting with fungi inoculation, and monitoring survival. She described existing restoration challenges, including 1) restoration of whitebark pine is further ahead than limber pine; 2) there is no rust screening facility in Canada, 3) seed sources are declining, 4) climate change may be exacerbating existing threats, 5) many dead forests might not have the right fungi for seedling survival, 6) the remoteness of 5-needle pine makes accessing these trees/forests difficult and increases the cost for restoration, and 7) wilderness areas on U.S. federal land have restrictions on certain types of restoration. One positive thing is that "natural selection" is already being observed.

View Cyndi Smith's full presentation at: <http://crownmanagers.org/storage/WBP-LP%20in%20CoC%20-Cyndi%20SMITH%20-%202016.03.18.pdf>



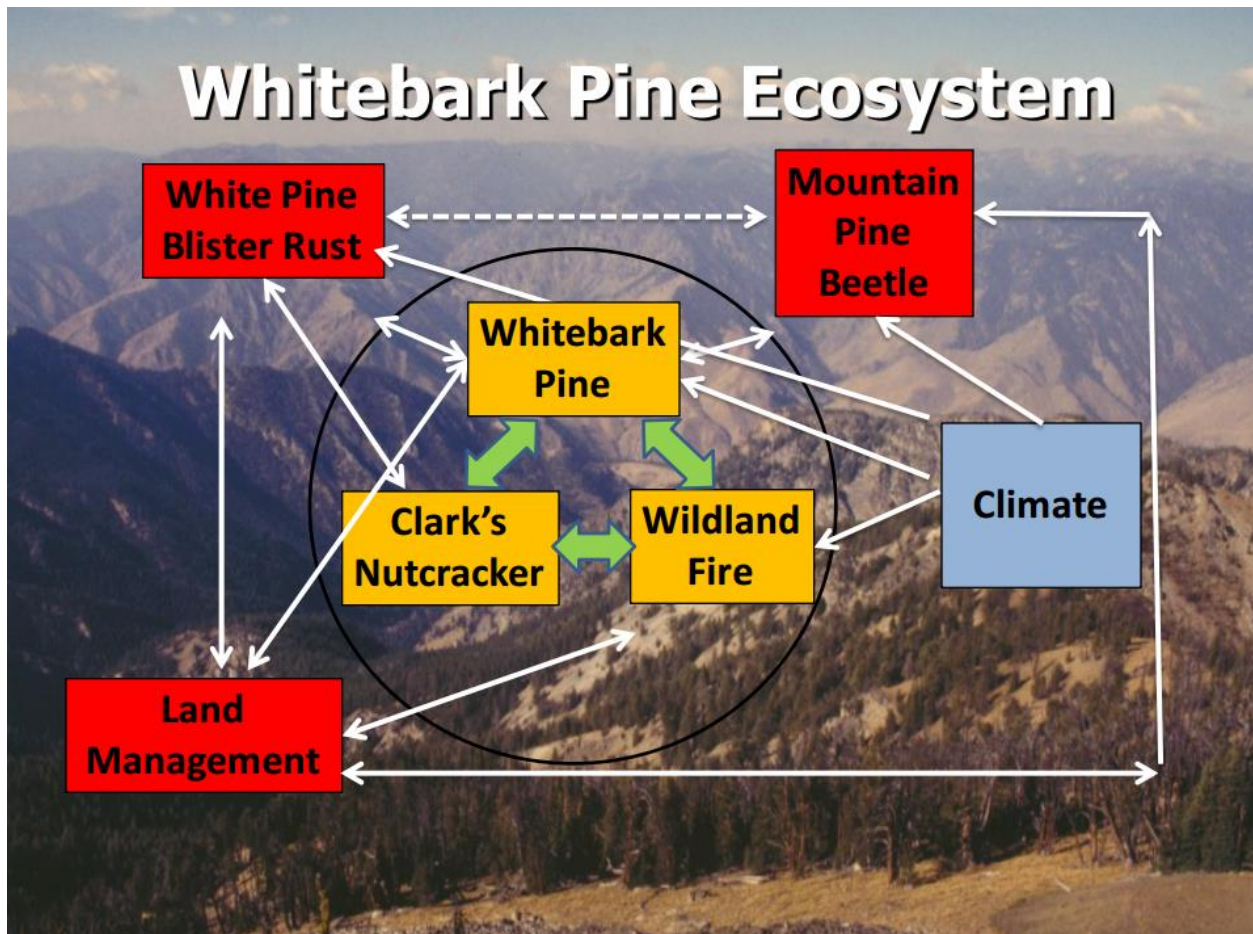
Slide from Cyndi Smith's presentation

Shannon Blackadder (Crown Managers Partnership/University of Calgary) reviewed the distribution of five-needle pine in the jurisdictionally-complex Crown of the Continent. Whitebark pine potentially occurs across 41% of the Crown, while limber pine occurs across 20% of the Crown, and all jurisdictions have five-needle pine. The Crown Managers Partnership received funding from the Great Northern Landscape Conservation Cooperative (GNLCC) to develop a fine-scale predictive model of whitebark pine distribution across the Crown, and Shannon shared preliminary results of that modeling. Testing of the model shows the results are highly accurate based on the input data, but Shannon reminds us that all models are wrong, even if some are useful. She reviewed the limitations of the model, including that it does not represent health, that it largely lacks true “absence” data (the model used pseudo-absence data), and noted that she received both point-data for individual WBP trees, as well as “stand-data”. These differences in input data, as well as areas where no data were available likely contribute to an over-and under-estimate of the probability of occupancy in certain portions of the Crown. Shannon challenged the audience to develop best practices for collecting and sharing data on 5-needle pine. Next, Shannon may develop a similar model for limber pine (although this is challenged by a severe lack of data), and perhaps consider inputting future climate variables to see how this affects future whitebark pine distributions. View Shannon’s presentation at: http://crownmanagers.org/storage/CMPForum2016_FernieFINAL-Shannon%20Blackadder%20copy%202.pdf



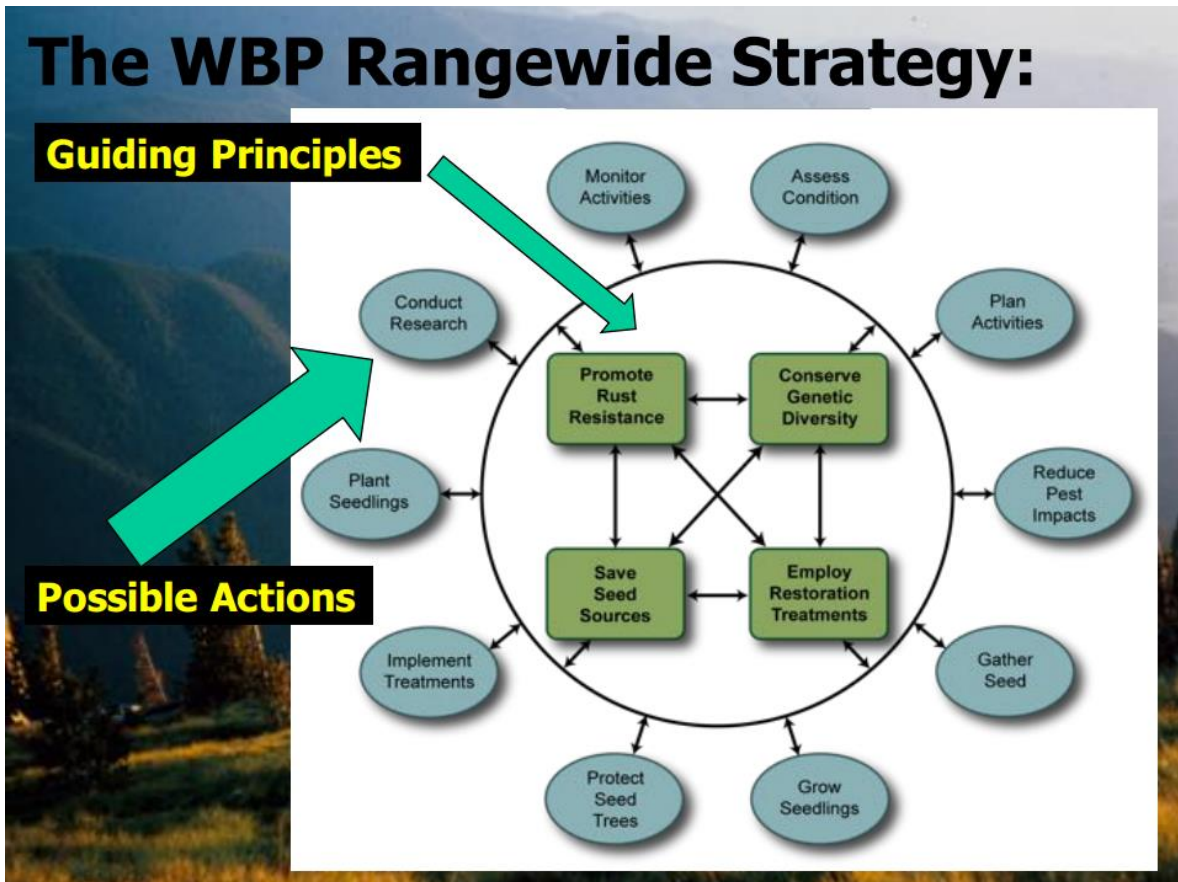
Preliminary results of whitebark pine distribution model, developed and presented by Shannon Blackadder

Dr. Bob Keane (Rocky Mountain Research Station) spoke to the impacts of climate change on five-needle pine, and how to consider existing restoration strategies in light of climate change. He noted that five needle pine is declining as a result of the complex interactions, including the stressors associated with mountain pine beetle, white pine blister rust, and land management, and the reliance of whitebark pine on Clark's nutcracker and fire, and noted that climate change influences all of these factors. He said our ability to address these interactions will dictate our restoration success.



Slide from Bob Keane's presentation

Bob noted that he and colleagues developed in 2012 a Whitebark Pine Rangewide Strategy ([click here](#) to find this strategy online) which provides guiding principles and possible actions to restore whitebark pine.



The 2012 Strategy didn't explicitly consider climate change, and Bob said that managers expressed concern about investing money in restoring whitebark pine if future climate was likely to alter suitable habitats for the species. As a result, the GNLCF funded the team to develop a companion document describing how to address climate change concerns in the context of the Rangewide Strategy document. (The companion document will be published later in 2016).

To develop the climate change companion document, Bob and his colleagues conducted a comprehensive literature search, as well as an extensive simulation experiment, to determine how climate change was likely to impact whitebark pine, and how to incorporate climate adaptation approaches into the restoration strategy.

Bob said that pines will respond to both changes in the biophysical environment as well as changes in disturbance regimes. However, there is great uncertainty in predicting future climates, as global climate models are driven by different factors and projections are widely variable. It is also highly uncertain as to how society will address emissions, which also affects future climate scenarios. Downscaling climate models also brings its own complications.



Bob Keane

Bearing that in mind, Bob conducted a simulation experiment for the Lake McDonald drainage in Glacier National Park. His experiment showed that this drainage will experience 10% more precipitation, and warming between 5-6 degrees. As a result, he said that we might expect a 50-100% increase in live plant biomass, an increase in evapotranspiration, that parts of the Crown will experience increases in soil moisture, while other parts experience a decrease in soil moisture, that there will likely be an increase in frost free days, and that we might see 10-30% decreases in snowpack. This may actually lead to faster growth for five-needle pine, but also for its competitors, leading to accelerated succession. Bob also noted we can expect a 30-50 day increase to the current fire season. He said the Crown will likely have higher fuel loading, which may increase fire intensity across the landscape, and that the Crown could experience 2-5 times more fire in the future. Bob also noted that blister rust spread is dependent on weather, so under climate change we could see an increase in wave years and in spread distances, as well as a

possible mutation of disease. However, the future strategy for whitebark pine restoration remains the same: Enhance natural rust resistance.

For take-aways, Bob emphasized that the increase both in the intensity and area burned might have a big impact on 5-needle pine restoration efforts. He stated the five-needle pine can exist in the future despite climate change, but that managers must enhance rust resistance and perform restoration activities. He cautioned that this will take a long time and require a high level of agency commitment. He ended by showing a picture of whitebark pine moving *downslope* and encroaching on sagebrush grasslands, a phenomenon that is totally counter to what is expected or predicted. This serves as a reminder that nature defines its own rules, and therefore we should not write-off a species, but instead focus on restoration.

Responding to questions from the audience, Bob stated that proactive prescribed burning will be a critical restoration strategy in the Crown. He suggested letting wildland fires burn in moderate fire years, as that helps to create the pattern of future fires (leading to landscape heterogeneity) and removes 5-needle pine competitors. He also suggested maintaining a heterogenous landscape is critical to managing mountain pine beetle populations, which may be bolstered by climate change. Clark's nutcrackers may also be impacted by climate change – their range is predicted to contract, and declining seed sources (because of high WBP mortality) is a source of concern.

View Bob's full presentation online at:

http://crownmanagers.org/storage/CROWN2016_Fernie_RestoringWhitebarkPineClimateChange-Bob%20Keane%20copy.pdf

Restoring whitebark pine in the face of climate change

- **Collect putative rust-resistant seed**
- **Grow rust-resistant seedlings**
- **Allow wildfire and WFU to do most of the work**
- **Plant as much as you can**
- **Prioritize using CC adaptation strategies**
- **Save the relics and rust-resistant individuals**
- **Patch in the holes with proactive restoration**
- **Measure and then measure again**

Use the two documents for reference for any management activities



Keane, Robert E.; Holsinger, Lisa M.; Mahalovich, Mary F.; Tomback, Diana F. 2015. Restoring whitebark pine ecosystems in the face of climate change. Gen. Tech. Rep. RMRS-GTR-XXX. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station XXX p

Once the science presentations were concluded, workshop participants were asked to discuss in small groups what they learned from the speakers, what new ideas they might apply in their own work, and finally what issues they might need help with to apply new ideas. Each break-out table then reported on the final topic, “what do you need help with”. These report backs were captured on flip charts and informed ongoing discussions throughout the workshop. Some of the topics that workshop participants reported wanting help applying included:

- Increasing rust screening/genetic testing
- Access to seeds and seedlings, including those inoculated with fungi
- Assistance with Plus tree management (e.g. tree identification, management, monitoring, and protection)
- Direction on best places to plant seedlings, number of acres required to plant to be effective
- Best practices/protocols for survey, inventory and monitoring (especially emphasizing fuels/fires indicators); developing a cross-jurisdictional monitoring network to track condition and trends across the landscape
- Help communicating the importance of fire and prescribed burning
- Help to understand how to effectively implement prescribed burning to minimize mortality (e.g. generating thresholds for controlled burning vs. letting fires burn vs. suppressing fires)
- Developing accurate distribution maps

- Help developing an effective citizen science program to engage the public and increase knowledge of distribution and condition of 5NP
- Help to defray or offset high costs of restoration (issue on tribal/private lands)
- Help to understand limitations for human intervention in Wilderness and at when might more proactive measures need to occur in wilderness to prevent extinction?
- Help understanding how available resources (e.g. the Montana Conservation Corps) can be a resource for inventory, pruning, monitoring, etc.
- Need help ensuring access to best available/most current science and treatment outcomes to target and refine restoration strategies.
- Help exploring opportunities for sharing or supporting work to identify genetic markers for blister rust resistance.
- Help understanding the distinct needs of restoring limber pine, particularly in post-fire landscapes.
- Help understanding how to measure success at reasonable time scales for management and funding.



Small-group discussion report backs Photo Credit: Ian Dyson

OBJECTIVE #2: DISCUSS EXISTING CHALLENGES AND/OR BARRIERS THAT MAY BE IMPEDING 5-NEEDLE PINE RESTORATION, AND DEVELOP RECOMMENDATIONS TO ADDRESS THESE ISSUES.

To address this objective, managers from many of the jurisdictions represented at the workshop were asked (in advance) to consider and answer the following three questions:

- 1) What do you perceive is the greatest challenge to your organization to successfully achieve its conservation/restoration objectives for 5-needle pine?
- 2) Do you have ideas or solutions to overcome this challenge(s)? How might coordination or collaboration across our shared landscape help overcome this challenge?
- 3) What do you perceive are the greatest opportunities that coordination or collaboration at the scale of the Crown of the Continent could foster with regard to conserving and restoring 5NP?

The following individuals provided their responses to these questions: Michael Murray (British Columbia Forest Service), Melissa Jenkins (Flathead National Forest), Brad Jones (Alberta Environment & Parks), Dawn LaFleur (Glacier National Park), Robert Sissons (Waterton Lakes National Park), Tony Harwood (Confederated Salish & Kootenai Tribes), Kella Sadler (Environment Canada), Michael Albritton (Bureau of Land Management), Alison Burton (Ktunaxa Nation), Karl Buermeyer (Helena/Lewis & Clark National Forest), Kari Stuart-Smith (CanFor), Dave Hanna (The Nature Conservancy), Warn Franklin (Teck). Andrew Bower (US Forest Service) and Diana Tomback (Whitebark Pine Ecosystem Foundation) also provided responses to these questions.

The responses of each panelist is captured in Appendix 3. As a result of this round-robin, workshop participants decided to narrow down the issues and opportunities identified to six priority topics. These included:

- How do we increase the pace and scale of 5-needle pine restoration?
- How will we raise awareness and political support to accelerate restoration?
- How can we mitigate the loss and degradation of 5-needle pine?
- Can we develop guidelines for restoring five-needle pine in highly protected areas?
- Can we develop a multi-jurisdictional monitoring network and database?
- Recognizing the important role of fire (both as a threat and a driver of 5-needle pine regeneration), can we develop guidelines on fire as a restoration strategy?

Much of the workshop was devoted to developing ideas and collaborative recommendations to address each of these questions. A combination of small break-out groups, a “gallery walk”, and full-group discussions allowed all workshop participants to put forward ideas for each of these challenges. These ideas were then distilled into clear recommendations, which are captured in Section 10 of this report: Workshop Outcomes and Implementation Strategy.

OBJECTIVE #3: CATALYZE A FORMAL CCE-WIDE WORKING GROUP WHOSE PURPOSE IS TO PROMOTE THE LONG-TERM VIABILITY OF 5-NEEDLE PINES IN THE CCE BY SHARING INFORMATION, LEVERAGING CAPACITY AND RESOURCES, AND PROMOTING 5-NEEDLE PINE PROTECTION AND RESTORATION.

Workshop participants were treated to a presentation from Ellen Jungck, who currently serves as the Chair for the Greater Yellowstone Coordinating Committee's Whitebark Pine Sub-committee. This sub-committee is an example of a formalized working group focused on conserving and restoring whitebark pine, and Ellen was invited to share insights and lessons learned to inform discussions regarding the potential need and value of a formal 5-needle pine working group in the Crown. It was noted that two other workshop participants (Melissa Jenkins and Karl Buermeyer) have also sat on the GYCC Whitebark Pine sub-committee, and could be valuable holders of knowledge related to this objective.

Ellen Jungck (Greater Yellowstone Coordinating Committee: Whitebark Pine sub-committee Chair) began her presentation by reviewing the history of the Greater Yellowstone Coordinating Committee (GYCC). It was formed in 1964, and set up as a MOU between the U.S. Forest Service and the National Park Service, and has since been expanded to include the Bureau of Land Management and the US Fish and Wildlife Service. The GYCC plays many roles, including ensuring coordination of planning, monitoring and practices across jurisdictions where it makes sense, setting landscape level priorities and assigning resources to achieve objectives, providing a forum for interaction with non-GYCC entities (including the public), minimizing duplication of efforts, sharing information, resources and data, and identifying and resolving on-going and emerging issues. The goal is to have "borderless behavior".

The GYCC operates through a series of subcommittees. The Whitebark Pine Subcommittee was established in 2001. The role of the subcommittee is to set landscape scale priorities and to provide funding to implement those priorities. The first order of business was to establish a charter. Next, the sub-committee created a whitebark pine base map. Next they developed a whitebark pine strategy, which is now being updated to incorporate climate science. They are currently working to develop an activities and monitoring database.

The Whitebark Pine Subcommittee has a base funding of \$250,000 annually, which is allocated through annual project request forms. Other funding sources used by the sub-committee include the USFS Region 1 Forest Health Protection Fund, the USFS National Reforestation Partnership Fund, National Forest Health Protection Ecosystem Management Fund, the National Gene Conservation Fund, the non-profit American Forests, and Congressionally appropriated funding from each agency.

Ellen discussed ways in which the subcommittee can move money to the agencies that need it to implement strategy projects, to minimize overlap, and to maximize ground coverage. She said that MOUs establish agency commitment and operating parameters between federal agencies. Interagency Transfers are utilized to move money between Department of Agriculture agencies and Department of Interior agencies. She said between national forests, the use of override/shorthand codes allows money from one forest to pay for activities on another forest.

Greater Yellowstone Coordinating Committee (GYCC) Whitebark Pine Subcommittee

Mission (est. 2001):

Create a collaboration of land managers, scientists, and other whitebark pine experts that leads to the long-term viability and function of whitebark pine ecosystems in the Greater Yellowstone Area.

Structure

- One representative (minimum) from each agency
- Chair/Co-Chair
 - Three-Year Term
 - Co-Chair replaces chair for continuity
- Executive Liaison
- Meet once/year minimum
 - Spring – Business Meeting (Teleconference)
 - Fall – Science/Business Meeting
- Utilize working groups as needed
- Cooperate with NGOs and universities
 - Montana State University
 - Whitebark Pine Ecosystem Foundation



Greater Yellowstone Coordinating Committee (GYCC) Whitebark Pine Subcommittee (Cont)

General History/Project Development

- 2001- Established Charter
- 2001-2004 – Developed base whitebark pine base map
- 2004-Present – Involved in range-wide tree improvement program (blister rust resistance)
- 2010-Present – Development of Seed Orchard
- 2004-2006 – Draft restoration guidelines
- 2004-Present – Establishment/Re-measurement of WPBR monitoring plots (WPEF protocols/GRYN)
- 2006-Present – Beetle protection measures in earnest
- 2006 – 2011 – Developed *Whitebark Strategy for GYA*
 - Updating base map/metadata
 - Stand Level Condition Assessment
 - Ecosystem Function Assessment
 - Ranking System for High Priority Restoration/Protection Areas
 - Tools for Implementation
 - Three Year Action Plan
- 2011-2015 – Developed *Adaptive Action Plan*
 - Tiers off strategy – latest climate science/sub-prioritized treatment areas
- 2015-Present – Developing Activity/Monitoring Database

In discussing lessons learned that might be applicable to the Crown, Ellen said that the Crown has more layers of agencies (e.g. an international landscape) which is more complex than the GYCC, which is comprised of U.S. federal agencies only. She noted that subcommittee members perform this work on top of their “regular” jobs, so support and buy-in from leadership is critical. She suggested focusing outward and finding additional funding sources for implementation from NGOs and/or foundations. She advised focusing on one or two items at a time and progressing slowly but surely, and she cautioned that whitebark pine restoration has both a high cost and complicated logistics.

In responding to questions, Ellen said the sub-committee does consider limber pine as well. She said they have been successful in having subcommittee member’s performance appraisal reflect their commitment to the sub-committee, which gives each member the appropriate permission to use their time to support sub-committee activities. In carrying out their work to develop a base map and restoration strategy, Ellen said appropriated dollars were used, although they had a dedicated person leading each task. When asked what they would do differently, Ellen said it would be very helpful to have a coordinator.

View Ellen’s full presentation at:

http://crownmanagers.org/storage/2016_GYCC_WBP_CMP_5NeedlePineForum-Ellen%20Jungcksm.pdf



Fernie peak. Photo Credit: Ian Dyson

Following Ellen’s presentation, workshop participants engaged in a discussion about the value and need for a formal Crown-wide working group focused on promoting five-needle pine restoration across our shared landscape. Folks commented that we would need to engage leadership at the highest level of agencies in order to make this reality. Other folks emphasized that there was a tremendous number and diversity of NGOs/private landowners/Tribes and First Nations/industry present at the workshop, so any effort to launch a formal working group should focus on the big “we” from the outset. Others talked about the value of weaving the cultural significance and storyline from the perspective of First Nations and Tribes into the Crown approach.

Folks said that success in this endeavor would be to develop a charter for a working group that is supported by senior leadership, and is focused on proactive (not reactive) approaches to restoring five-needle pine on the landscape. Participants also defined what success would look like, and said in a year, success would be the existence of a formalized working group, with strong commitment from its members, some funding to hire a coordinator, a means to engage the larger community, and progress towards implementing the recommendations that were identified by this workshop. It was noted that a North Continental Divide Five Needle Pine Working Group currently exists, although it has no formal structure, no higher level structure and is strictly information sharing, but this might be a good place to start. When asked directly by the facilitator if the Crown Managers Partnership should help to support launching a formal working group, workshop participants easily reached consensus: YES.



Fernie Mayor Mary Giuliano welcoming workshop participants to Fernie. Photo Credit: Ian Dyson

OBJECTIVE #4: INITIATE A PROCESS TO DEVELOP A CCE-WIDE 5-NEEDLE PINE RESTORATION STRATEGY THAT IDENTIFIES AND PRIORITIZES THE TYPE, AMOUNT AND LOCATION OF RESTORATION ACTIVITIES, PROTECTION MEASURES AND MONITORING THAT ARE NECESSARY TO RESTORE 5-NEEDLE PINE IN THE CCE.

Once workshop participants reached consensus on forming a formal Crown-wide working group, there was acknowledgement that many of the recommendations that were formalized into workshop outcomes could, when brought together, form a cohesive restoration strategy for the Crown. Participants acknowledged that several of the outcomes related to increasing knowledge of the location and health of the species through a comprehensive inventory and monitoring effort, and formalizing a multi-jurisdictional formal working group would need to precede a formal restoration strategy.

WORKSHOP OUTCOMES AND IMPLEMENTATION STRATEGY

On the final day of the workshop, participants were asked to form small break-out groups and to identify a clear path forward for advancing the seven workshop outcomes that were agreed upon by workshop participants. Specifically, participants were asked to identify specific actions to be taken, who needed to be at the table to enable those actions, and reasonable timelines to achieve the outcomes. Based on these final efforts, workshop organizers distilled the following Implementation Strategy for the seven workshop outcomes.

OUTCOME #1: CATALYZE A FORMAL “HIGH-FIVE” CROWN-WIDE WORKING GROUP

WHY: Workshop participants agreed to work towards the development of a formal “High-Five” Crown-wide working group. The purpose of the working group would be to advance our collective effort to effectively prioritize, monitor, conserve, and restore five-needle pine in the Crown of the Continent. The working group would house the various “task forces” that will deliver on other workshop outcomes, including the delivery of a Crown-wide monitoring database and network, the development of a Crown-wide restoration strategy and action plan, etc. The working group should set up a governance structure that is approved by agency leadership, and is capable of enabling delivery of all identified outcomes (including, if identified, the ability to pool funding and/or resources across jurisdictions). The working group should include all jurisdictions and stakeholders, and should weave cultural, ecological, economic and political factors together from the start.

WHAT: An small “Organizing Committee” should work to accomplish the following tasks by September 1, 2016:

- Convene an initial Executive Committee meeting by June, 2016 to get started;
- Create an inventory list of all jurisdictions/stakeholders that should be included, and gauge their ability to commit (or what they need in order to commit) to participating in a working group

- Create a survey to send to inventoried groups (above) to determine most important functions/structure of a formal working group; and
- Draft a working group governance structure and charter.

WHEN: At the Whitebark Pine Ecosystem Foundation Conference in Kalispell, September 15, 2016, convene a first meeting of the full High-Five Crown-wide working group to approve the governance structure and charter, and to discuss the delivery status of other workshop outcomes.

WHO: The following individuals are potential Organizing Committee members:

- Melissa Jenkins, Flathead National Forest (Lead)
- Brad Jones, Alberta Environment & Parks
- Ken Reed, Bureau of Land Management
- Randy Moody, Independent
- Dawn LaFleur, Glacier National Park
- Ali Burton, Ktunaxa Nation
- Amanda Hendrix, US Fish and Wildlife Service
- Roian Matt, CSKT
- CANFOR rep
- Teck rep
- CMP rep
- Diana Tomback, WPEF



Workshop participants in small-group discussions. Photo Credit: Lisa Talavia-Spencer

OUTCOME #2: DEVELOP A MITIGATION STRATEGY AND BEST MANAGEMENT PRACTICES TO AVOID DEGRADATION OR LOSS OF FIVE-NEEDLE PINE

WHY: While five-needle pine is not targeted for harvest, industrial development does lead to the loss and degradation of five-needle pines. Where mitigation is required, it is typically done 'on-site' of the industrial footprint, which may or may not be the most effective way to mitigate for impact. Workshop participants expressed an interest in developing a unified mitigation strategy that could direct mitigation activities to pre-identified priority areas, even if this was 'off-site' from the permitted activity.

Participants also discussed the need for detailed scientifically-based best management practices when working in areas where pines are present. Workshop participants also discussed in great length how to ensure the new Canadian whitebark pine federal recovery rule will lead to effective conservation and mitigation, and suggested developing a training webinar targeted at industry and permit reviewers to explain the obligations of the critical habitat rule to support effective compliance.

WHAT: Workshop participants expressed an interest in executing three discrete tasks:

1. Develop a 5NP Mitigation Strategy that would a) develop appropriate mitigation measures, b) identify best opportunities for 'off-site' mitigation, and b) explore mechanisms and avenues (e.g. a mitigation bank) to enable effective mitigation at multiple scales.
 - a. Review existing mitigation schemes, including the draft mitigation strategy that Jodie Krakowski has drafted for Alberta.
2. Identify detailed "Best Management Practices" for operations carried out in 5NP forests to most effectively avoid loss and degradation. These BMPs would be sent to Environment Canada for incorporation into the forthcoming WBP Critical Habitat rule.
3. Develop a training webinar for permit reviewers on 5NP that can live on-line (perhaps on WBEF website) that explains the obligations of the critical habitat rule, how to identify "terminal" WBP stands, and other topics to ensure 5NP is consistently conserved and restored under all permit operations.

In addition, Environment Canada committed to identifying legislative gaps and pursuing mechanisms to fill those gaps as related to implementation of the WBP Critical Habitat rule (e.g. two issues raised included Alberta's Wildlife Act current lack of regulations related to plants, and BC's lack of legal protection for whitebark pine).

WHO: The following individuals committed to working initially to catalyze action on the three tasks identified above by holding an initial planning meeting in spring/summer of 2016:

- Randy Moody (Lead)
- Jodie Krakowski, Alberta
- Michael Murray, BC Forest Service
- Kella Sadler, Environment Canada
- Kari Stuart-Smith, Canfor
- Warn Franklin, Teck
- Alison Burton, Ktunaxa
- Joanne Vinnedge

OUTCOME #3: LAUNCH A CCE-WIDE MONITORING AND INVENTORY DATABASE

WHY: A clear and detailed understanding of where whitebark pine and limber pine occur across the Crown, as well as their condition (tracked through time), is crucial to inform an effective landscape-scale restoration action plan. Currently, this knowledge is fragmented: some jurisdictions have good occurrence and condition data, and some, including private lands, have nearly none at all. Data are better for whitebark, but very limited for low-elevation limber pine. Workshop participants agreed that a CCE-wide common database of stand-level occurrence and condition was necessary to inform a CCE-wide restoration strategy. Participants also expressed a desire for an information hub that could house the following types of information: case studies of restoration successes, failures, effectiveness levels and lessons learned; best management practices for operating in 5NP; standard inventory and mapping protocols; and results of CCE-wide mapping products. Participants also discussed the importance of expanding the footprint of long-term monitoring across the landscape, and to focus on the collection of absence data.

WHAT: A committee, including 5NP experts, decision makers and managers, should be convened by summer of 2016 to identify the following:

1. What the driving management questions, and what data needs to be collected to effectively answer those questions?
2. What data are agencies/organizations currently collecting? Where/how are these data currently stored?
3. What are the opportunities/needs to design a centralized database (either a single database, or a networked database). Where could such a centralized database and information hub be hosted, designed and accessed?

WHO: The following individuals expressed an interest in working on this committee:

- Shawn McKinney (lead)
- Cyndi Smith
- Mike Durglo, CSKT
- Dave Hanna, The Nature Conservancy
- Joyce Gould, Alberta Parks
- Shannon Blackadder, CMP
- Rob Sissons, Parks Canada
- Greg Denitto, USFS
- Michael Murray, BC

WHEN: Workshop participants discussed convening this subcommittee in summer of 2016, with the goal of launching a centralized database/information hub by March of 2017.

OUTCOME #4: DRAFT (AND IMPLEMENT) A CROWN-WIDE RECOVERY PLAN

WHY: Whitebark and limber pine are in peril, and securing these species ability to persist across the Crown (and throughout their range) will require a concentrated and coordinated set of restoration actions. Workshop participants expressed a desire for a Crown-wide Recovery Plan that would address the following:

- prioritize areas for conservation and restoration (and link to Outcome #2 – the mitigation strategy);
- incorporate clear guidelines for restoration where applicable (e.g. see Outcome #5, guidelines for working in wilderness/reserves; and Outcome #6, guidelines for fire);
- identify mechanisms for sharing resources (including people/teams, contracts for work, funds, seeds, and seedlings);
- identify opportunities for new funding (e.g. through foundations/partnerships with NGOs, etc.); and
- ensure the strategy fits into broader scale restoration priorities beyond the Crown.

Participants noted that other regions (the Greater Yellowstone, the Pacific North West) also have region-wide restoration plans that are aligned with the Whitebark Pine Range-wide Restoration Strategy, which provide a strong template which a CCE-wide recovery plan can be built from.

WHAT: Workshop participants identified three sets of tasks that are necessary to initiate a Crown-wide Recovery Plan:

1. Formal support to participate in the development (and presumably implementation) of the Recovery Plan needs to be secured from participating jurisdictions;
2. A workshop is needed to identify the structure and substance of a recovery plan.
 1. First, agencies/organizations should be inventoried to determine their existing program status (plus trees, planting, propagation, resources, successes, challenges)
 2. Second, a landscape-scale analysis needs to be done to identify synergies, efficiencies, gaps, opportunities for collaboration, and interim priorities. The restoration strategy should have annual or bi-annual work plans.

WHEN: A conference call among self-identified committee members should be convened by summer 2016 to introduce the concept and determine how to execute this activity.

WHO: The following individuals volunteered to sit on the Crown-wide Recovery Plan committee:

- Michael Murray, BC (Lead)
- Melissa Jenkins, Flathead NF
- Rebecca Lawrence, GNP
- Rob Sissons (Co-lead), Waterton Lakes
- Bob Keane, RMRS
- Brad Jones, AB E&P
- Kari Stuart-Smith, Canfor
- Bureau of Land Management
- Taylor White, nurseries
- Need tribal participation (Roian Matt?)
- Diana Tomback, WPEF

OUTCOME #5: DEVELOP RECOMMENDATIONS FOR 5NP RESTORATION IN HIGHLY PROTECTED AREAS

WHY: A large amount of whitebark pine occurs in highly protected areas (in the U.S., approximately 50% of whitebark pine occurs in designated Wilderness areas). The protection level afforded to these areas can restrict or even prohibit certain restoration activities. Workshop participants discussed whether there might be recommendations developed to help protected areas managers and decision makers thoughtfully address restoration of five needle pine forests in highly protected areas.

WHAT: Workshop participants expressed an interest in convening a conference call among protected areas managers, tribal wilderness managers, and interested stakeholders to develop some recommendations that explicitly acknowledge the benefits and drawbacks of managing highly protected five-needle pine stands. Some key areas for discussion include:

- Guidance for development of a Crown-wide Recovery Plan, specifically how might highly protected areas best fit into a landscape scale strategy (e.g. as control areas, or areas for beneficial wildland fire use, etc.);
- How might the Aldo Leopold Wilderness Research Institute decision-making framework guide our thinking about restoration in wilderness areas where the default alternative is for managers not to intervene (e.g. how might we think about thresholds/triggers for action); and
- How can a deliberate tracking of restoration actions inform future thinking about restoration in highly protected areas (e.g. how might we monitor existing restoration outside of protected areas to accelerate learning about efficacy where managers do decide to intervene, determine what might be suitable (or necessary) within protected areas to sustain the larger meta-population – need to link to Outcome #3, monitoring efforts).

WHEN: A conference call to discuss the points above will be convened in spring/summer of 2016.

WHO: The following individuals should be involved:

- Anne Carlson, The Wilderness Society (Lead)
- Jimmy Gaudry, US Forest Service
- Beth Hahn, Aldo Leopold Wilderness Research Institute
- CSKT
- Mary Riddle, Glacier National Park
- Rob Davies, Flathead National Forest
- Mark Storie, Alberta Parks
- Andy Bower, Pacific Northwest Forest Service
- Lisa Machnik, Region 6 US Forest Service
- Amanda Weber-Roy, BC Parks

OUTCOME #6: DEVELOP RECOMMENDATIONS TO GUIDE PRO-ACTIVE FIRE MANAGEMENT IN FIVE-NEEDLE PINE FORESTS

WHY: Fire has both positive and negative implications for whitebark and limber pine. Regeneration of these species is closely linked to newly burned areas, and fire is important for removing competitors. However, higher-intensity fires can kill five-needle pines, which poses a threat, particularly to important individuals (e.g. Plus trees, reproductively mature trees) and stands (e.g. climax stands). Wildland fire use and prescribed fire are important restoration tools, particularly in the Crown given anticipated increases in productivity (leading to increased competition) and increases in the size and intensity of fires as a result of climate change. Workshop participants discussed several needs, including the need to engage fire managers directly in five-needle pine restoration objectives, the need to develop common best practices for using/fighting fire in the context of five-needle pine forests, and the need to accelerate post-fire monitoring using standardized monitoring protocols, so we can learn more about effective fire use.

WHAT: The following tasks were identified:

1. Draft a five-needle pine “Best Practices of Fire Use and Management” guide, and encourage agencies/organizations to incorporate it into their fire plans to ensure a consistent approach to the application of fire, with clear objectives (this should also be included as part of the Crown Recovery Strategy).
2. Develop an email list of fire managers and other relevant people to aid in communication and sharing of information.
3. Coordinate spatial data between fire managers and mapping specialists to ensure appropriate and consistent wildfire responses in five-needle pine forests.

WHO: The following individuals were identified as having a role in this outcome:

- Jed Cochrane, Parks Canada (Lead)
- Scott Murphy, Parks Canada FMO
- Bob Keane, RMRS Fire Sciences Lab
- Michael Albritton, BLM
- Fire Management Officers from National Forests
- Ron Swaney (FMO for CSKT)
- Ryan Good, Alberta WFSS
- Scott Jevons, Alberta Parks (Kananaskis Country)
- Brenda, Region 1 NF Fuels Program Manager
- Jean Walters, Mike Black, British Columbia, WS
- Peter Holmes, BC FLNRO
- Dave Hanna, The Nature Conservancy
- Dave Soleim, Glacier National Park
- Adrian Leslie, Nature Conservancy of Canada
- Ken Schmid, BLM
- Michael Murray

OUTCOME #7: DEVELOP A MULTI-FACETED COMMUNICATIONS STRATEGY TO RAISE AWARENESS AND SUPPORT FOR FIVE-NEEDLE PINE RESTORATION AND CONSERVATION

WHY: Despite the imperiled status of whitebark and limber pine in the Crown, these species do not command the same level of support and priority of other imperiled species. Part of what will enable more vigorous conservation and restoration of these species is increased awareness and support from the public, policy makers, decision makers, industry and community stakeholders. A multi-faceted communications strategy would identify the key audiences to target, and identify and prioritize communications to those audiences, with the end goal of supporting an increase in the pace and scale of restoration across the Crown.

WHAT: Workshop participants expressed an interest in a multi-faceted communications strategy to raise awareness and broaden support amongst multiple audiences, for the purposes of increasing the pace and scale of restoration across the Crown. Participants did note that a communication strategy would have to be tightly knit to other collaborative activities, so the communications doesn't get out ahead of "clear messages" and can be matched well with "key asks", also certain types of "branding" and other activities already in place can be promoted from the start. Ideas for elements of a communications strategy included:

- Branding – e.g. a common slogan, common messaging, common solutions;
- Interpretive signing (can borrow from Pacific North West region), tours for the public;
- Development/promotion of an app, that serves to educate and also can serve as inventory tool
- Curriculum-based education services, extension materials, and education that can be promoted via social-media;
- Organize field tours with key decision and/or policy makers;
- Partner with key constituencies to help disseminate the message (e.g. tourism industry, newspaper/other media, youth groups, backcountry rangers, etc.); and
- Include the important role of fire in communicating/educating the public.

WHO: The following individuals expressed interest in joining a Communications committee, and suggested having a group meeting by June 30 to determine group composition and responsibilities.

- Megan Evans, Alberta Environment and Parks (Co-Lead)
- Julie Shamhart, Whitebark Pine Ecosystem Foundation
- Heidi Eijgle, Alberta Environment and Parks
- Randy Moody, Whitebark Pine Ecosystem Foundation of Canada
- Ashley Wruth, John Stoesser or Christy Gustavison – Waterton Lakes National Park
- Janette Turk, Public Affairs Officer from Flathead National Forest
- Others suggested included Camina Weasel Moccasin (Blood Tribe), Brenda Davidson to help with engaging private landowners in her area, Taylor White to help engage NGOs and nurseries, Kella Sadler who is developing a consultation package for forthcoming Federal Recovery Plan, and someone who works for Mark Storie.

WORKSHOP ACKNOWLEDGEMENTS

This workshop served 87 participants from 43 governments and organizations, and by all accounts was a great success. The success of this workshop is due to the commitment of a number of dedicated individuals, to whom the Crown Managers Partnership wishes to extend their deepest appreciation.

First, the CMP gratefully acknowledges the funding support provided by the Great Northern Landscape Conservation Cooperative for providing staff capacity to enable workshop organization, the modeling of whitebark pine across the Crown, and for supporting the research work and development of the whitebark pine climate adaptation strategy document led by Dr. Robert Keane. The CMP is also very grateful to Alberta Environment and Parks for providing the room rental for the workshop, and to the Glacier National Park Conservancy, who sponsored the evening social for workshop attendees at the Fernie Museum. The CMP is also very grateful to the Fernie Museum for hosting the social at their wonderful museum, located in downtown Fernie, British Columbia.

Next, the CMP would like to gratefully acknowledge the contributions of the following individuals, who served on an inter-agency planning committee that designed the format and content of this workshop. Those individuals included:

- Melissa Jenkins, Flathead National Forest
- Brad Jones, Alberta Environment & Parks
- Michael Albritton, US Bureau of Land Management
- Dawn LaFleur, Glacier National Park
- Bob Keane, Rocky Mountain Research Station
- Mary Frances Mahalovich, USDA Forest Service
- Randy Moody, Whitebark Pine Ecosystem Foundation of Canada
- Mike Durglo, Confederated Salish and Kootenai Tribes
- Roian Matt, Confederated Salish and Kootenai Tribes
- Michael Murray, BC Ministry of Forestry, Lands and Natural Resources
- Karl Buermeyer, Helena and Lewis & Clark National Forest
- Robert Sissons, Waterton Lakes National Park
- Polly Buotte, University of Idaho

The CMP also thanks the core members of the Crown Adaptation Partnership for providing the organizing capacity for this workshop:

- Regan Nelson, Crown Conservation Initiative
- Anne Carlson, The Wilderness Society
- Ian Dyson, Alberta Environment and Parks
- Erin Sexton, University of Montana/Crown Managers Partnership
- Linh Hoang, Northern Rockies Adaptation Partnership/US Forest Service
- Stephen Legault, Crown Conservation Initiative

The workshop facilitator, **Lisa Talavia-Spencer**, brought great finesse and skill to her job, and played a key role in ensuring the workshop successfully fulfilled its objectives. Many thanks to the Alberta Culture and Tourism Office for supporting Lisa's role in this workshop.



Lisa Talavia-Spencer, Workshop Facilitator

Sasha Harriott, the secretariat of the Crown Managers Partnership, coordinated the endless number of logistics necessary to successfully pull off an international workshop. The workshop literally would not happen if it wasn't for her heroic efforts. The CMP is very grateful.



Crown Managers Partnership Secretariat, Sasha Harriott

Finally, the CMP wishes to thank the excellent speakers and presenters that participated in this workshop, as well as the dedicated individuals from across the Crown who showed up, engaged in earnest and provocative discussion, and committed to engaging in advancing the workshop outcomes in pursuit of maintaining five-needle pine on our shared landscape.

Thank you.

APPENDIX 1: WORKSHOP ATTENDEES

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APPENDIX 2: WORKSHOP AGENDA

TUESDAY, MARCH 15, 2016	
1:00 – 4:30	Crown Managers Partnership Agency Meeting
5:00 PM	Forum Registration Meet and Mingle with Cash Bar
5:45 PM	Buffet dinner begins
6:00 PM	Welcome and Opening Remarks <ul style="list-style-type: none"> • Ian Dyson, <i>Crown Managers Partnership and Crown Adaptation Partnership</i> • Participant Introductions
7:00 PM	<p>Why We Care: The Ecological and Cultural Significance of Five Needle Pine Forests in the Crown of the Continent</p> <p>Keynote: Restoring the Crown Jewels: The High Five pines and why we need them. Diana Tomback, <i>Whitebark Pine Ecosystem Foundation</i></p> <p>Panel: Traditional Ecological Knowledge and Five Needle Pine Forests <i>Moderator: Mike Durglo, Confederated Salish and Kootenai Tribes</i></p> <ul style="list-style-type: none"> • Tony Incashola, Sr., <i>Confederated Salish and Kootenai Tribes</i> • Mike Bruised Head, <i>Kainai Nation</i> • Terry Tatsey, <i>Blackfeet Nation</i> • Wayne Louie, <i>Ktunaxa Nation</i>
WEDNESDAY, MARCH 16, 2016	
TIME	ACTIVITY
7:30 AM	Registration for new arrivals
8:00 AM	Welcome Mary Giuliano , <i>Mayor of Fernie</i>
8:05 AM	Agenda Review, Overview of Workshop Outcomes Lisa Talavia-Spencer , <i>Workshop Facilitator</i>
8:30 AM	Whitebark and limber pine in the Crown of the Continent: status, trends and restoration Cyndi Smith , <i>Emeritus Scientist</i>
8:50 AM	An Overview of CCE-wide Whitebark Pine Distribution Shannon Blackadder , <i>Crown Managers Partnership</i>
9:15 AM	Restoring Five Needle Pine Forests Under Climate Change Bob Keane , <i>Rocky Mountain Research Station</i>
10:00 AM	Break

10:50 AM	Full Group Discussion: Reflect on the new Best Available Science presented this morning
11:45 AM	Poster Session Lunch
1:00 PM	Panel: Jurisdictional Perspectives of the Challenges and Opportunities associated with 5 Needle Pine forest restoration in a period of rapid climate change.
2:30 PM	Break
2:45 PM	Full Group Discussion: Reflect on the day's conversations
3:00 PM	Break-out Groups: Discuss existing challenges and opportunities to collectively advance or accelerate 5NP conservation and restoration.
4:00 PM	Report back from Break-out Groups
4:30 PM	Wrap-up; Preview next day Lisa Talavia-Spencer, Workshop Facilitator
5:30 PM	Wine and Cheese Event at Fernie Museum Featuring the Whitebark Pine Ecosystem Foundations of the U.S. and Canada Diana Tomback, Whitebark Pine Ecosystem Foundation Michael Murray, Whitebark Pine Ecosystem Foundation of Canada

DINNER ON YOUR OWN

THURSDAY, MARCH 17, 2016

TIME	ACTIVITY
8:00 AM	Review of Day's Objectives - <i>Lisa Talavia-Spencer</i>
8:15 AM	The Greater Yellowstone Coordinating Committee Whitebark Pine Subcommittee: Overview and Ideas for the Crown of the Continent Ellen Jungck, Chair, GYCC Whitebark Pine Subcommittee
8:45 AM	Full Group Discussion: What are opportunities for cross-jurisdictional action? <i>Facilitated by Lisa Talavia-Spencer</i>
9:45 AM	Gallery Walk: Contribute ideas to inform development and delivery of key actions identified in preceding plenary
10:30 AM	BREAK
11:00 AM	Break-out Groups: Gather ideas into a coherent agenda for advancing key actions identified earlier in the day.
11:30 AM	Report back from groups
12:00 PM	Full Group Exercise: Identifying Next Steps: Who, What, When, Where, Why?
12:45 PM	Closing remarks Regan Nelson, Crown Conservation Initiative

APPENDIX 3: PANEL RESPONSES: JURISDICTIONAL PERSPECTIVES OF THE CHALLENGES AND OPPORTUNITIES ASSOCIATED WITH FIVE-NEEDLE PINE FORESTS IN A PERIOD OF RAPID CLIMATE CHANGE.

Managers from many of the jurisdictions represented at the workshop were asked (in advance) to consider and answer the following three questions:

- 1) What do you perceive is the greatest challenge to your organization to successfully achieve its conservation/restoration objectives for 5-needle pine?
- 2) Do you have ideas or solutions to overcome this challenge(s)? How might coordination or collaboration across our shared landscape help overcome this challenge?
- 3) What do you perceive are the greatest opportunities that coordination or collaboration at the scale of the Crown of the Continent could foster with regard to conserving and restoring 5NP?

Responses are captured below.

Michael Murray – BC Forest Service

CHALLENGES

- Awareness (Lack of Ministry engagement and awareness)
- Need to educate government
- \$ goes to commercial tree operations
- Continued decline from mountain pine beetle
- Climate change – increase temp, increase PPT
- COSEWIC listing – BC has listed below endangered or threatened status, blue-listed in B.C.

OPPORTUNITIES & SOLUTIONS

- Memo from chief forester to recommend conserving WBP
- The listing is the biggest opportunity
- Director of all provincial lands has advocated planting WBP seedlings / rust resistant and has made funding available

Melissa Jenkins – Flathead National Forest

CHALLENGES

- Lack of priority (Lack of \$)
- Need increase understanding
- Public and agency awareness
- Need formal structure – formal working group
- NEPA – Lengthy, complicated process
- Policy restrictions – operating restrictions in wilderness areas
- Conflict with other listed species – lynx
- Uncertainty in climate change
- Lack of broad-scale and consistent monitoring / co-ordinated research

OPPORTUNITIES & SOLUTIONS

- Need to establish a formal working group
- Need to ID funding sources and approach them as formal working group
- Sharing success stories from on-the-ground projects

Brad Jones – Alberta Environment and Parks

CHALLENGES

- Competition with other priority species
- Need people capacity and \$
- Need political will
- Effective communication – need to get the information out there to people
- Commercial use of public lands/industry

OPPORTUNITES & SOLUTIONS

- Alberta does have an action/recovery plan that makes this species a priority
- This plan has created resource streams – but not enough
- Would help to have borderless sharing of resources, esp. screening
- Information, technology, science sharing

Dawn LaFleur – Glacier National Park

CHALLENGES

- Climate change, uncertainty
- Effectiveness – monitoring (lots of effort in GNP)
- Wilderness – accessibility, planting, Tx strategies
- Inability to use fire

OPPORTUNITIES & SOLUTIONS

- Lessons learned from restoration / monitoring success stories; work on WMP/Limber pine has been occurring in GNP since 1990s
- Climate change has led to recent fire that created restoration opportunities
- Lessons learned from identified areas of natural regeneration

Robert Sissons – Waterton Lakes National Park

CHALLENGES

- Prioritizing how to use funding – what makes the most ecological sense?
- Prioritizing areas for restoration action
- Translating the best available science into action
- How to use fire correctly on landscape? Protect plus trees
- Patience – will take 10 years to get rust resistant trees on the ground
- Need to share successes

OPPORTUNITIES & SOLUTIONS

- They are well-funded (1.5 million over 5 years) to do restoration for both spp.
- Opportunities to prioritize areas for action within 7 different national parks
- May have identified some blister rust resistant limber pine

Tony Harwood – CSKT Forestry and Planning

CHALLENGES

- Small organization
- Data and organization – need information on location and health
- Fire management – transfer of threat is a risk
- \$
- Uncertainty – need adaptive management
- Need to commit to long-term monitoring

OPPORTUNITIES & SOLUTIONS

- Mandate opportunity to view WBP restoration and conservation through a cultural lens
- Strong collaborative relationships – USGS, USFS, Salish-Kootenai College
- Have about 100,000 acres of WBP
- Do intend to do prescribed fire in Tribal areas, Wilderness areas
- Have just committed to doing a genetic study with USFS/ Mary Mahalovich – also with students involved (education)

Kella Sadler – Environment Canada

CHALLENGES

- WBP Recovery strategy (coming 2016 – required under SARA) is “bare bones”
- Lots of unknowns – known range?
- Uncertainty in regional and local scale climate impacts
- Lack low elevation information
- Lack of education/communication

OPPORTUNITIES & SOLUTIONS

- Working on development of Federal WBP recovery plan right now that utilized best available science
- Recovery plan will have a communications component built into it that could benefit managers across the Crown

Michael Albritton – BLM

CHALLENGES

- Smaller land base in the CCE
- Need data – what they have, where and condition
- Communication across agencies
- Data and communication with adjacent jurisdiction

- Lack of capacity, staff, \$
- Turnover
- Need interagency group for inventory, mapping, and monitoring

OPPORTUNITIES & SOLUTIONS

- Working group would benefit all WBP Managers in town
- “there’s not a lot of us”, so can move pretty quickly to implement
- Sometimes BLM has less competition for funding
- Working on MOU with CSKT to collaborate
- Working on planning process right now

Ali Burton – Ktunaxa Nation

CHALLENGES

- KNC restoration objectives are challenged by lack of land ownership/jurisdiction over Treaty area
- Communication across multiple landowners across the landscape
- Need one area to share
- Need structured approach for mitigation work and clear prioritization so we get the biggest bang for \$

OPPORTUNITIES & SOLUTIONS

- Having everyone in the same room today: unified approach, a big network
- Goals of this workshop – big opportunity

Karl Buermeyer – Helena, Lewis & Clark National Forest

CHALLENGES

- Historical mining district with private in-holdings
- Access / cost of seedlings
- Inter-agency barriers
- Lack of formal structure to overcome these barriers (like the GYCC has)
- Barriers to using fire
- Currently over-planting to compensate for rust

OPPORTUNITIES & SOLUTIONS

- Formal working group!
- Could reduce costs of planting if we had more blister rust resistant seeds, which would reduce # of seeds/plants planted (i.e. lower mortality rate)

Kari Stuart-Smith – CanFor

- Sometimes 5NP are incidentally taken in mixed stands
- High Conservation Value Forests (HCVF) stands have been heavily hit with blister rust
- Lack of inventory to ID individual trees in mixed stands
- Inability to be precise w/ machinery

- Difficulty in getting rust-resistant trees \$ and time
- Pressured by BC Forest Service not to regenerate WBP
- Monitoring and availability of best science and practices

OPPORTUNITIES & SOLUTIONS

- ID highest priority WBP stands and set them aside as high conservation value forests (no logging or road building)
- CanFor is really good at planting!! We know how to plant WBP seedlings (if we can get them)
- Access to best available science has been really helpful
- Graduate students as resources in this work

Dave Hanna – The Nature Conservancy

CHALLENGES

- Wants to focus on low elevation limber pine stands at grassland interface
- Lack of information about the low elevation limber pine stands
- 0 data and mapping / monitoring
- 1 degree occurs on private lands
- How to pool expertise for low elevation limber pine

OPPORTUNITIES & SOLUTIONS

- Have already done a lot of work to re-introduce prescribed fire back into limber pine stands for many years.
- Opportunity to do mapping of these low elevation stands (limber) across jurisdiction (private, tribal, state) to generate learning.

Warn Franklin – Teck Coal Ltd.

CHALLENGES

- Big footprint
- Starting from scratch in mined areas
- Need more info on ecosystem approach on severely disturbed areas
- Lack of healthy trees and capacity to find them
- Working only on private lands currently – want to work across boundaries
- Lack of security regarding future uses on both private and public lands – investment in restoration

OPPORTUNITIES & SOLUTIONS

- Investing in ecosystem-based restoration projects for 60 spp of trees and plants, with WBP ranking #1 on that list.
- Coordinating with province
- Working with First Nations
- Working with CanFor
- Information sharing – someplace to go to get it and a forum to bring lessons learned back to opportunity for a rust resistant seedlings centre?

Additional Comments

Andy Bower – USFS Pacific Northwest region

- Rust resistance is important, but not a silver bullet in and of itself.
- All management activities – Rust resistant seedlings, reduction of competition etc. will need to be used together, not one alone

Diana Tomback

- Need to know your tree community type before you implement restoration strategy > emphasis the need for inventory and monitoring