2016

Wetlands and Wetland Loss in the Peace-Slave Watershed

Wetland Working Group Report to the MPWA IWMP Steering Committee

Aerial view of several boreal wetlands. Courtesy Bin Xu.

Wetland Working Group
4/1/2016

EXECUTIVE SUMMARY

The Mighty Peace Watershed Alliance (MPWA) Integrated Watershed Management Plan (IWMP) Steering Committee struck a multi-sector *Wetlands and Wetland Loss Working Group* to investigate a number of wetland-related topics and provide recommendations to the Steering Committee for consideration in their planning process. The Working Group met four times, sharing sector perspectives and information, before drafting this report.

Overall, the Working Group found that all five wetland types occur across the Peace-Slave watershed with some types, like swamps, more prevalent in some areas, like the Wabasca sub-basin. However, it is difficult to assess the current state of these wetlands without an adequate baseline. In addition, there are gaps in the data for types (Shallow Open Water wetlands), areas (Wood Buffalo and Jasper National Park) and historical loss.

Until we have a better understanding of the current state of wetlands, as well as an understanding of how the new Wetland Policy and its implementation will affect sector operations in the watershed, it is challenging to set wetland management priorities. Hence the majority of recommendations made by the Working Group focus on building better baseline information, and communicating this information to everyone in the Peace-Slave watershed.

"We need to acknowledge the need to more pro-actively manage wetlands as an integrated part of the landscape, with a view to a healthy watershed, both now and in the future."
Working Group Member

Wooded Fen. Courtesy Marsh Trites-Russell.

ACRONYMS

AAF	Alberta Agriculture and Forestry
ABMI	Alberta Biodiversity Monitoring Institute
ACA	Alberta Conservation Association
AEMERA	Alberta Ecological Monitoring, Evaluation and Reporting Agency
AEP	Alberta Environment and Parks
AER	Alberta Energy Regulator
BMP	Best or Beneficial Management Practices
DUC	Ducks Unlimited Canada
GOA	Government of Alberta
GOC	Government of Canada
IWMP	Integrated Watershed Management Plan
MPWA	Mighty Peace Watershed Alliance
PAD	Peace Athabasca Delta
PADEMP	Peace Athabasca Delta Ecological Monitoring Program
PC	Parks Canada
TEK	Traditional Ecological Knowledge
WBNP	Wood Buffalo National Park
WG	Working Group
WPAC	Watershed Planning and Advisory Council

ACKNOWLEDGEMENTS

The Working Group (listed in Appendix 1) acknowledges their sectors and agencies for supporting their participation on the Working Group. In particular, we thank all those who made sector presentations and provided additional information to inform our work. We also thank MPWA staff for their administrative support of the Working Group as well as the staff of the Coca-Cola Centre (City of Grande Prairie) for their logistical assistance. Finally, we thank the Mighty Peace Watershed Alliance for providing this opportunity to provide meaningful input into their Integrated Watershed Management Plan for the Peace-Slave watershed.

INTRODUCTION

BACKGROUND AND METHODOLOGY

After completing a '*state of the watershed report*' and in developing their terms of reference for an Integrated Watershed Management Plan (IWMP), the Mighty Peace Watershed Alliance (MPWA) identified a number of topics relevant to future areas of work, including *'wetlands and wetland loss'*. Wetlands comprise more than 25% of land cover of the Peace-Slave watershed and are an important component of overall watershed function and health.

To investigate this topic further, the IWMP Steering Committee struck a multi-sector Wetlands and Wetland Loss Working Group (WG). Membership of this group is listed in Appendix 1. The Steering Committee also developed a terms of reference (Appendix 2) listing a number of wetland-related topics for the WG to investigate further.

The WG met four times between December 2015 and March 2016. After sharing sector perspectives and information on wetlands and wetland management in the Peace-Slave watershed, the WG then developed recommendations for the Steering Committee. This includes a work plan with future wetland-related activities for consideration in the MPWA IWMP.

While they endeavored to work in a multi-sector, consensus-seeking manner, the WG was limited by the short amount of time provided to undertake their tasks. Thus while this report provides a summary of what was learned and discussed, as well as a number of recommendations for consideration in further work, it by no means implies WG consensus or broad sector approval. Further sector engagement and consultation on wetlands and other related topics will be necessary as the IWMP process moves forward.

A northern marsh. Courtesy Jennifer Van Patten.

Working Group Findings

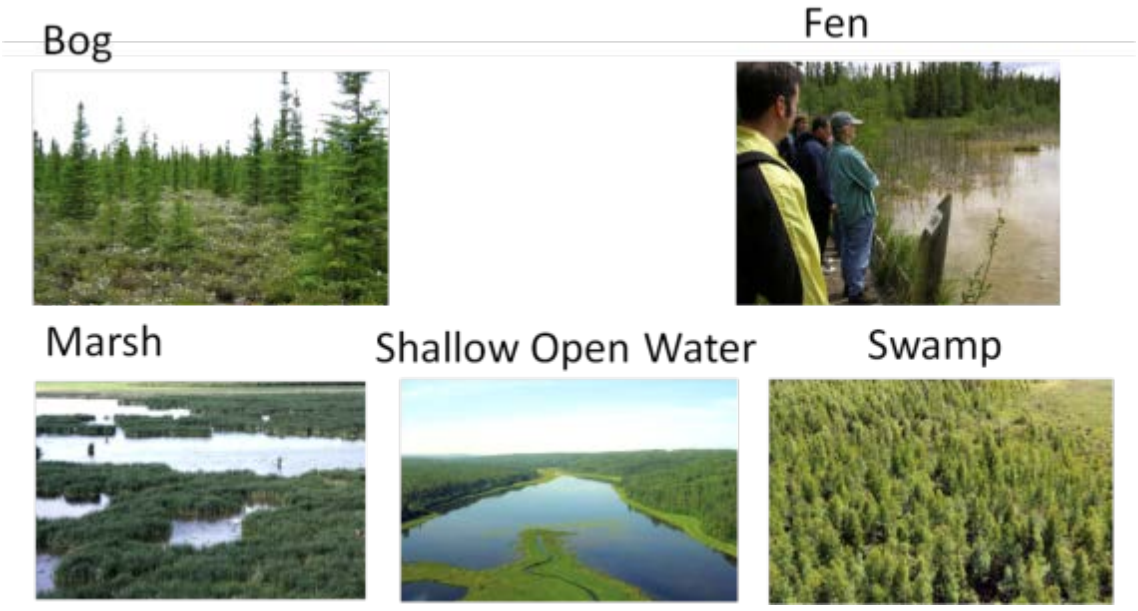
Definition of Wetlands

The Working Group reviewed the definition of wetlands included in the MPWA state of the watershed report, as well as the definition included in the Alberta Wetland Policy and concluded the two definitions are similar enough and accurately describe wetlands in the Peace-Slave watershed. That is, *"a wetland is land saturated with water long enough to promote [wetland or aquatic processes as indicated by the] formation of water altered [poorly drained] soils, growth of water tolerant [water-loving] vegetation, and various kinds of biological activity that are adapted to the wet environment"*.

It was noted that wetlands do not necessarily hold water year-round. Some may be permanently wet while others may only hold water for one or two months each spring. In addition, wetlands can be associated with both flowing and stagnant water.

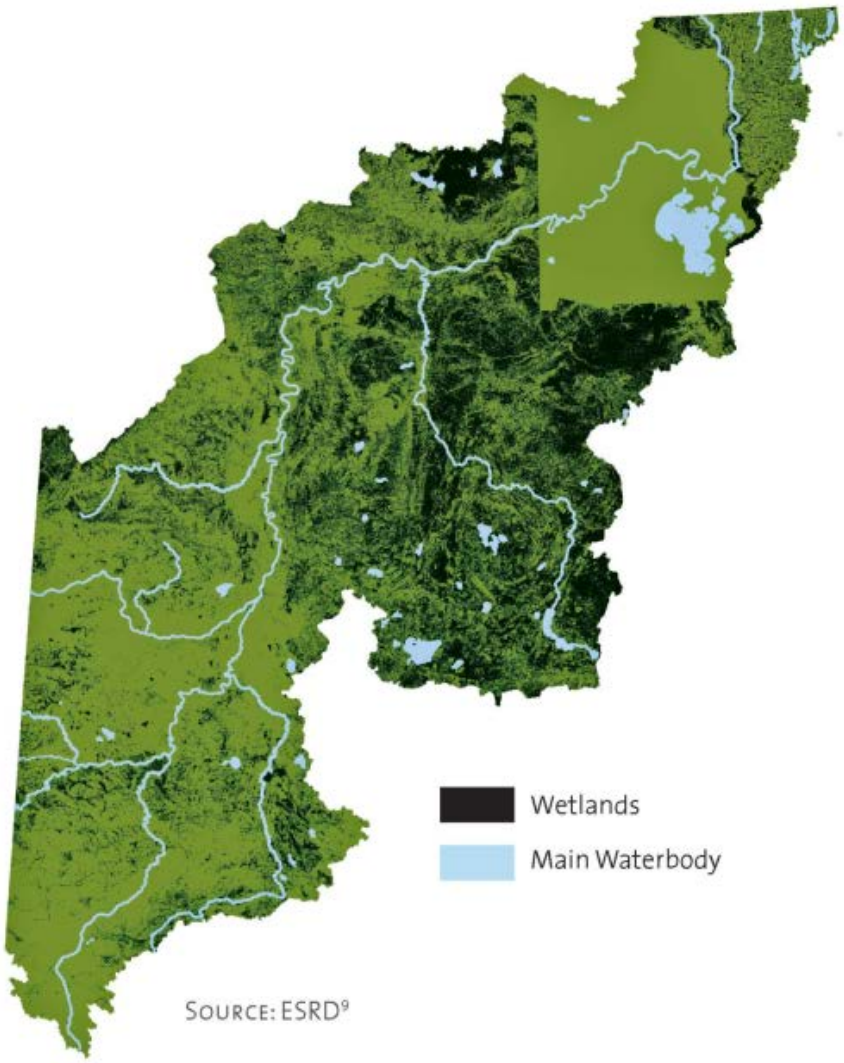
Wetland Types in the Peace-Slave Watershed

There are two groups of wetlands in Alberta including peat wetlands and mineral wetlands. Bogs and Fens are two types of peat wetlands. Marsh, Shallow Open Water and Swamp are mineral wetlands. These five types of wetlands differ in terms of water saturation and permanence (hydrology), and the types of plant and animal communities that they support. They can also be broken down further into forms as per Alberta Wetland Classification System. All five types occur in the Peace-Slave watershed. Additionally, restored natural wetlands and constructed man-made wetlands (usually for stormwater management) also exist in the Peace-Slave watershed.



Wetland Distribution in the Peace-Slave Watershed

The Peace-Slave watershed, Alberta's largest watershed, includes five natural regions including Rocky Mountains, Foothills, Parkland, Boreal Forest and Canadian Shield. It also includes both Settled (White) Area and Non-Settled (Green) Area. These varied landscapes, with associated differences in geography, climate, settlement patterns, disturbance, etc. give rise to the variation in historic and present-day wetland distribution throughout the region.

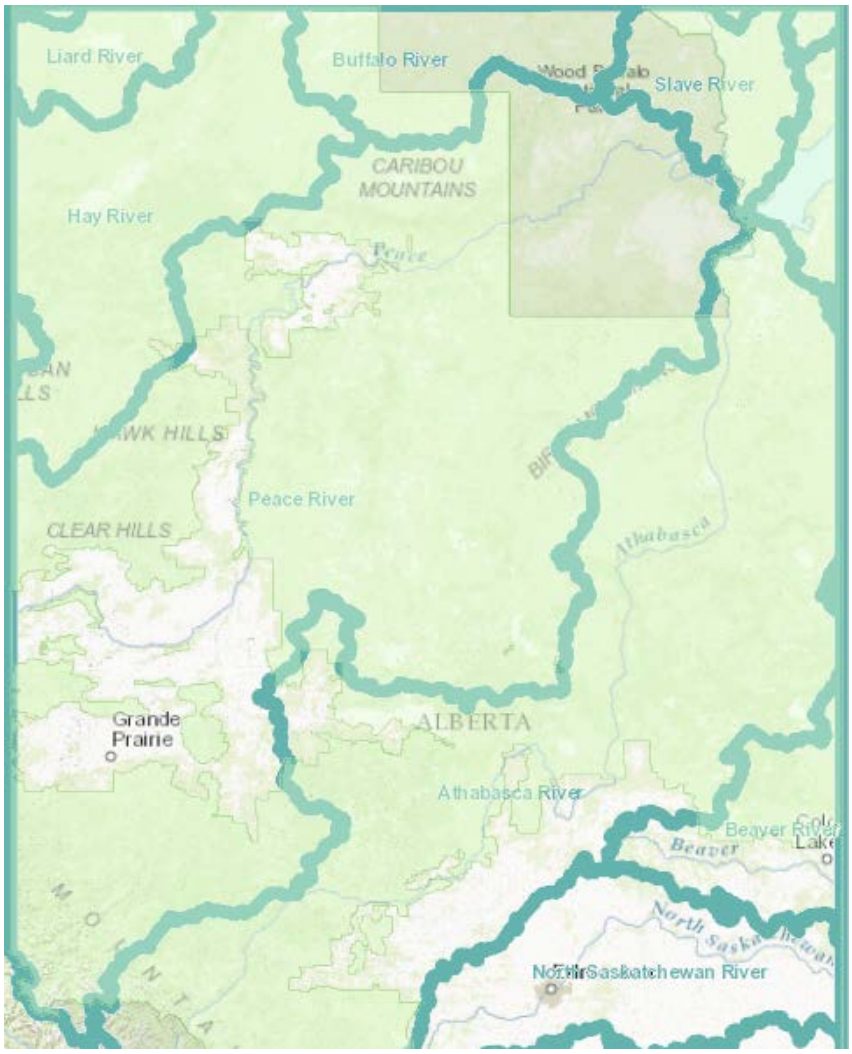


Today, at least a quarter (25% or 52,899 km^2) of the Peace-Slave watershed is made up of wetlands.[1] Due to difficulty in separating them from other open water (lakes, rivers, etc), this figure does not include Shallow Open Water wetlands. It also does not include Jasper National Park and Wood Buffalo National Park (WBNP). WBNP contains most of the Peace-Athabasca Delta and makes up almost 5% of the Peace-Slave watershed.

[1] All figures, unless otherwise specified, are taken from the MPWA state of the watershed report.

Of the four remaining wetland types, Swamp wetlands are predominant and cover 9.5% of the watershed, followed by fens (7.5%) and bogs (7.0%). Marshes, though present throughout the watershed (1.2%), are not numerous relative to other wetland types. Note however that historical disturbance is greater in the White Area than it is in the Green Area, likely affecting the current number of marsh wetlands, which presumably were more prevalent in the Peace Parkland before this area was settled and converted to agricultural lands.

Green and White Areas of Alberta



Wetlands also vary by sub-basin. Over half (55.9% or 29,565 km^2) of the wetland area found in the Peace-Slave watershed occurs in the Wabasca sub-basin, followed next by the Central Peace (15.9%) and the Lower Peace (12.6%) sub-basins. In contrast, the Upper Peace (3.5%) and the Slave River (2.4%) sub-basins have far less wetland cover. We can also look individually at each sub-basin to better understand the wetland distribution in each (Table 1). For example, within the Wabasca sub-basin, 34% of wetlands are Swamp wetlands.

Table 1. Distribution of wetlands in the Peace-Slave Watershed by sub-basin.

Sub-basin	% Sub-basin as wetland (km^2)	% Bog (km^2)	% Fen (km^2)	% Marsh (km^2)	% Swamp (km^2)	% of sub-basin disturbed
Smoky-Wapiti	11.1 (5,198)	11.0 (572)	28.4 (1475)	3.8 (198)	56.8 (2953)	29.9
Upper Peace	10.5 (1,836)	23.2 (425)	28.9 (530)	3.0 (55)	44.9 (825)	45.3
Central Peace	23.7 (8393)	28.3 (2376)	20.3 (1704)	7.1 (597)	44.3 (3716)	16.9
Lower Peace*	22.9 (6660)	21.6 (1436)	35.5 (2368)	10.2 (676)	32.7 (2180)	6.2
Wabasca*	44.2 (29,565)	33.3 (9870)	29.7 (8807)	3.2 (952)	33.6 (9936)	2.7
Slave River*	9.4 (1,247)	0.9 (11)	65.8 (821)	9.5 (118)	23.8 (297)	0.10
Total *	29.2 (52,899)	7.0 (14690)	7.5 (15705)	1.2 (2596)	9.5 (19907)	15.1

- Area is for full watershed. Wetland area does not include WBNP. This lowers the percentage of wetlands.

Data Gaps

Current Wetland Distribution

As mentioned above, missing from the discussion on current wetland distribution in the Peace-Slave watershed is data on Shallow Open Water wetlands not included in the MPWA state of the watershed report. These wetlands include potholes and sloughs (ponds), as well as waters along rivers and lakeshore areas. They are usually relatively small bodies of standing or flowing water commonly representing a transitional stage between lakes and marshes, or between spring high water levels and levels during the remainder of the year. Given the amount of water present in the Peace-Slave watershed, particularly in Boreal Forest natural regions, it is likely that Shallow Open Water wetlands are an important component of future wetland management.

The Government of Alberta (GOA) has developed the Alberta Merged Wetland Inventory (AMWI). This GIS desktop map of wetlands for the province was compiled from a variety of wetland inventories developed by the GOA and/or through partnerships. The AMWI replaces previously released Alberta Canadian Wetland Classification System (CWCS) Merged Wetland Inventory data from November 6, 2013.

The AMWI is a generalized, merged product of 30 component wetland inventories that utilized different types of source data from different years, different data capture specifications and different classifications. Considerable variation in the level of detail and accuracy is present in this dataset. At the present time, wetland data are not available for the entire province. There are data gaps along the eastern slopes and in Wood Buffalo National Park. A very limited assessment of the classification

accuracy on the merged inventory was performed using digital ortho-photography. A significant amount of misclassification is present for most of the inventory, largely due to the coarseness and the methodology used to derive the merged inventory. Hence, this tool has limitations (e.g., it under-represents marshes and does not include ephemeral Class I waterbodies which are important in the Peace-Slave watershed particularly for waterfowl) and requires further steps including ground-truthing to verify wetland type and delineation.

Interestingly, again, because of the difficulty in separating other types of shallow open water (lakes, ponds, etc), the province has included *all* open water in the AMWI. Although all water, bed and shore of permanent waterbodies are managed similarly through the *Water* and *Public Lands* acts, mitigation only applies to wetlands. Hence, determination of Shallow Open Water wetlands will presumably be required by project proponents requiring *Water Act* approvals as of June 2016. (This is required, as of June 2015 in the White Area.) Unfortunately, this does not help regional, watershed or municipal planning processes for both lakes and wetlands. Ideally, the next step would be for the province and the MPWA members to work together to further refine this data layer, separating Shallow Open Water wetlands from other types of open water at the landscape level.

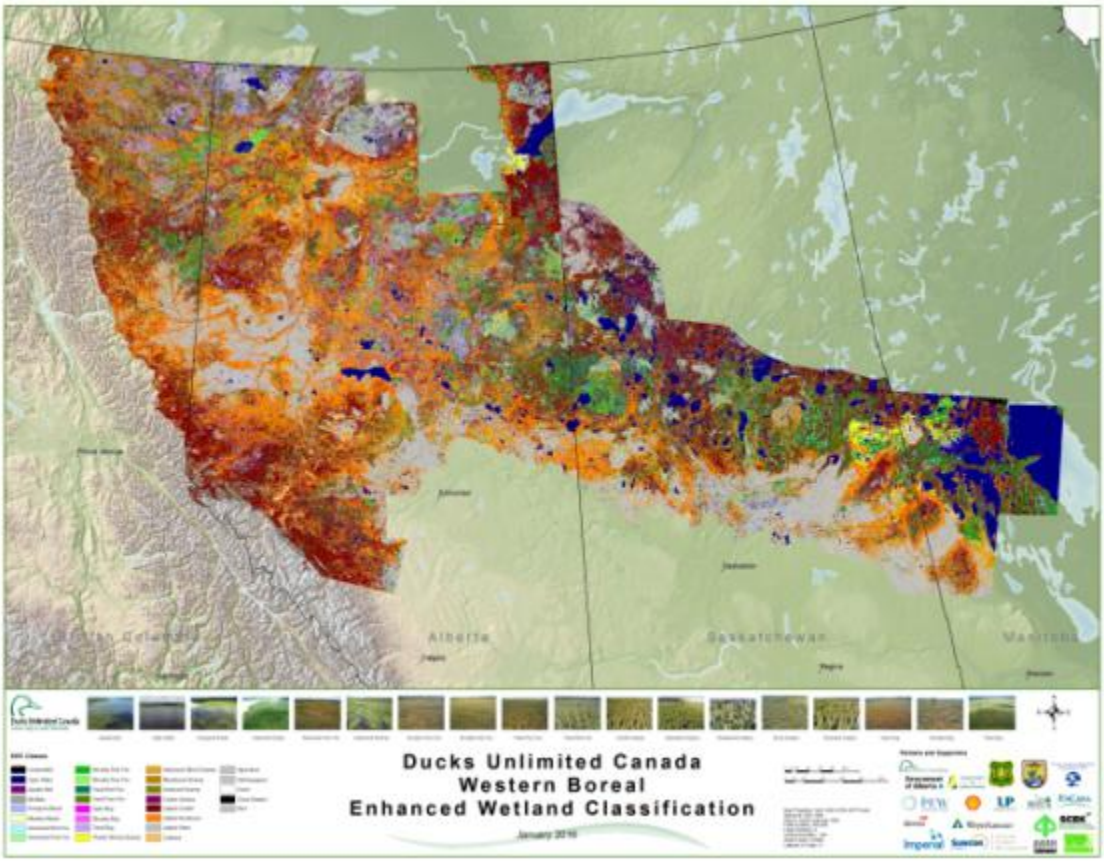
Alberta's Merged Wetland Inventory shows the following wetland types and cover in the Peace-Slave watershed:

- Bog = 13,814.8km^2
- Fen = 15,898.4 km^2
- Swamp = 18,729.6km^2
- Marsh = 2,536.8km^2
- Open water* = 15,052.1km^2

*Open water includes both shallow open water wetlands and deeper water/non-wetland open water area.

Another gap in the wetland inventory includes recent fires (~20 years old), where wetland types and distribution cannot be mapped, thereby under-representing the type and extent of wetlands currently reported. This gap can be addressed by acquiring imagery that pre-dates fires, classifying those areas and compiling a more comprehensive inventory of wetlands throughout the landbase.

Also missing from the current wetland distribution discussion is the inclusion of wetlands in WBNP. Taking a watershed approach, it is important to include all of the drainage area, regardless of jurisdiction and man-made boundaries. Currently, WBNP staff indicate that wetlands in the park are largely undisturbed, except for a few winter roads. They have mapped the extent of open water and flooded vegetation in the park. In 2016, they are initiating work to inventory wetlands by type. Ideally, this information will be made available to the MPWA for inclusion in the next iteration of their state of report and watershed management plans. In the meantime, one would assume that wetland distribution in the park is similar to the rest of the Lower Peace sub-basin (although the interactions between the rivers, lakes and wetlands in this delta are certainly unique). Thus, the park is likely *at least* one-third wetlands. However, wetland type within the delta portion of the park at least may be more representative of Shallow Open Water and Marsh wetland classes, with fewer bogs and fens. Ducks Unlimited Canada is very close to completing their wetlands mapping for north-western Alberta. When released, this information will help fill the data gap around wetland type but again, does not include federal parks.



Historical Wetland Distribution and Wetland Loss over Time

Currently, there has not been a lot of work done on identifying historical (pre-European settlement) wetland distribution throughout the Peace-Slave Watershed. However, this information could likely be reconstructed, to some degree, by using traditional knowledge, early maps, and current mapping technology. However, before this is done, it would be important to establish why this information is needed and what management questions it would answer or what actions it would spur going forward.

Comparing historical and current wetland distribution would inform us about the location and extent of wetland loss over time. Looking at current disturbance footprint, we might start this work in the sub-basins with the highest land base disturbance including the Upper Peace (45% disturbance) and Smoky-Wapiti sub-basins (30% disturbance), where settlement and conversion to agricultural crop lands has likely led to a high level of wetland loss in the watershed. We might also look at change in the Peace-Athabasca Delta where regulation of the Peace mainstem has changed the hydrology and its association with the flooding of wetlands in the delta.

Understanding Wetland Function and Health

Finally, a data gap that came up in WG discussion was the limited understanding of which ecological functions each particular wetland type provides, their relationship to other water features such as groundwater, flood plains, riparian areas, etc. and how this in turn contributes to the overall health of the Peace-Slave watershed. Once this is understood, we can begin to understand what functions and/or areas are impaired from or vulnerable to future wetland loss. It can also inform future restoration priorities in order to restore function and health.

Some of this information has been studied in other watersheds in Alberta and elsewhere, particularly for marshes in the prairies and parklands of the southern White Area. Those peatland studies that have been undertaken in the Green Area to date occur near the Athabasca oilsands (Fort McMurray, Cold Lake). Research on peatlands in the Peace-Slave watershed is limited and mostly driven by caribou habitat and carbon storage studies. Hence if the MPWA was going to influence research in this area, it might encourage efforts to improve understanding of all boreal wetlands including swamps, which make up a large portion of wetlands in this basin.

Wetland Values and Benefits

Although some work has been done on a project/site basis through federal and provincial environmental impact assessment processes, there is currently no basin-wide accounting of the cultural, social, economic and environmental value of or the benefits provided by wetlands specifically in the Peace-Slave watershed. However, the WG discussed this topic and identified the following list of wetland values and benefits relevant to this watershed as the following:

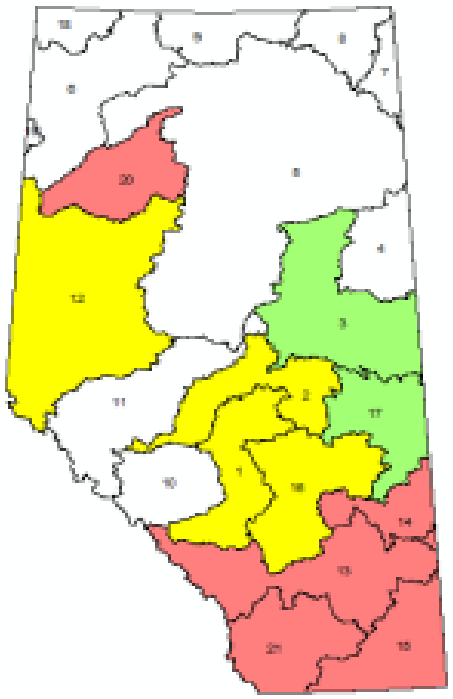
- cultural, spiritual, inspirational, and recreational opportunities
- store and purify water, improving source water quality
- moderate flow thereby reducing erosion and stabilizing shorelines
- mitigate floods and droughts and help maintain the overall annual water budget
- discharge and recharge groundwater
- moderate weather and climate
- process and store green house gases and provide a carbon sink
- provide habitat for species of concern (e.g. caribou) and other animals , fish and plants, thus sustaining biodiversity
- provide food and water, medicinal and spiritual plants
- provide peat, fur and other economic benefits

During meetings of the Wetland Working Group, it was noted that the Peace-Slave watershed falls within Treaty 8 and is home to many First Nations and Métis communities and their traditional lands. Wetlands are of particular importance to this population and to their way of life, particularly in the

Green Area, the Peace-Athabasca Delta, and the lower part of the watershed. As discussed by the team, there is a need for wetland stewardship and conservation throughout the basin. This is not so much about "managing" wetlands, as it is about mitigating the effect of human activities on them such that wetlands remain healthy, for current and future generations.

Note that a Relative Wetland Value Map has been developed by the GOA as a tool for implementing the Alberta Wetland Policy, and specifically, for estimating proponent mitigation obligations required through the Alberta Wetland Mitigation Directive. The map is just an estimator for planning purposes rather than serving as a regulatory tool. At the regulatory stage, an on the ground assessment is required and the assessed value might differ from the predicted value.

For this tool, relative wetland value considers the contribution of a wetland to biodiversity, flood mitigation, water quality enhancement and human uses. This does not preclude other agencies using different values for different policy, planning, stewardship and restoration initiatives. Currently (February 2016), only the Upper part of the basin has been included in this analysis.



Alberta Wetland Valuation Areas Completed (March 2015)

Figure 1. A screen shot from the Alberta Wetland Rapid Evaluation Tool

(http://geodiscover.alberta.ca/Viewer/?Viewer=GDA) showing the estimated value for the sections containing Crystal Lake, portions of Muskoseppi Park and several wetlands in the City of Grande Prairie. Note that the majority of these wetlands are given an "A" or "high" value.

Current and Future Pressures

Wetlands are not static and undergo change over time due to succession and other natural events such as fire, beaver or climate cycles (i.e. both wet and dry periods). Fire in the past was a tool used by aboriginal peoples to 'reset' succession and to encourage the growth of desired plants and the wildlife that grazed on them. Today, fire, light grazing, and haying can all be used by wetland managers such as Ducks Unlimited Canada to maintain the uplands around wetlands. .

In the more recent past, agriculture and settlement (urban and rural) were the largest anthropomorphic pressures on wetlands in the Peace-Slave watershed. In the southern part of Alberta (White Area), these activities have led to a loss of approximately 70 per cent of wetlands. It is estimated that Alberta continues to lose approximately 0.3-0.5 per cent of its wetlands each year.

Wetland Loss

Throughout the team's discussion about wetland loss, it was noted that agriculture presents a challenge to both wetland managers and landowners. To keep wetlands a part of this working landscape, the MPWA and its agricultural partners can help by promoting a stewardship ethic, providing information about best management practices including incentives through the Growing Forward II, Environmental Farm Plan and other programs, and by creating an awareness of and compliance to the Alberta Wetland Policy, the *Water Act* and the *Public Lands Act*.

In the past, pressures in the Green Area were small and limited to roads, utility and other linear disturbances from forestry, oil and gas, mining (peat, gravel, coal, bitumen) and recreation (versus land conversion). However, over time, and particularly in the last two decades, the cumulative impact of these activities has grown significantly. Although programs like the Alberta Biodiversity Monitoring Institute (ABMI) are measuring this footprint, it is more challenging to understand the impact it has on wetland functions and health and further research is needed in this area.

Although it may not be intuitive, flow of the mainstem of the Peace River also affects wetland health. In the past, the Peace and Athabasca rivers were known as a dynamic system of spring ice jams and overbank flooding which inundated many of the "perched basins" (wetlands and small lakes) of the Peace-Athabasca Delta. With the regulation of the Peace River in the late 1960s, this flow regime has changed. However, without a historical benchmark, and documented monitoring and assessment over time, it is challenging to determine the extent of this change and how it has affected wetland health.

A Treed Fen. Courtesy Bin Xu.

Wood Buffalo National Park and the Peace Athabasca Delta

The Peace Athabasca Delta (PAD), listed as a Ramsar Wetland of International Importance, is world renowned as a large flood-dependent wetland complex providing habitat for migratory waterfowl and shorebirds, at risk or sensitive species such as Wood Bison, Yellow Rails and Peregrine Falcons and culturally important species such as moose and muskrat. Natural flooding of the Peace and Athabasca rivers maintain productive wetland habitat in this area. When floods are less frequent, wetlands in the delta start to dry, leading to changes such as an increase in invasive thistles and areas covered by tall shrubs.

Much of the delta is located within Wood Buffalo National Park. WBNP staff are one of many partners involved in the Peace Athabasca Delta Ecological Monitoring Program (PADEMP) that has a mandate to measure, evaluate and communicate the state of the delta. This group publishes a newsletter and holds an annual forum, which encourages information sharing, engagement and collaboration among knowledge-holders and stewards of the PAD. They are also using muskrat monitoring to bring traditional knowledge and western science together to improve monitoring and management of the delta. Muskrat are an ecological and cultural keystone species with population health linked to water extent and depth, vegetation community, flood frequency and predation. Note that while they are not in the Peace-Slave watershed, the Hay-Zama Wildland Park and the Bistcho Lake area are also both important wetland complexes that should be acknowledged. As the Lower Peace Regional Planning process will include this area (technically the Liard and Hay watersheds), any efforts at refining wetland inventories for the Peace-Slave might also consider including these watersheds as well.

In the future, the cumulative effects of continued population growth and industrial development and climate change (and climate variability which may bring extended periods of drought, different precipitation patterns, invasive species, etc.), may become larger pressures affecting wetlands. Like most watersheds, the Peace-Slave is not immune and will likely show signs of impairment from a combination of factors affecting watershed health such as wetland and riparian loss and degradation, regulated and reduced flows, point and non-point source pollution, flood plain development, etc. Some areas are already showing the stress of these combined factors. For example, degradation of the Red Willow and Beaverlodge rivers from a variety of factors has led to a decline in water quality and in fisheries health. Fortunately, stewardship efforts to combat these pressures are working to reverse this decline.

The long term impact of these growing pressures on wetlands and wetland health, specifically in the Peace-Slave watershed is currently unknown. In some cases, drained wetlands can be restored where it is beneficial to do so. In other cases, wetlands, and the functions they provide, are irretrievably lost. In many areas of the Peace-Slave watershed, groundwater is important for domestic and livestock watering use. Areas such as these may be more sensitive to wetland loss and the aquifer recharge and discharge services they provide. Mapping wetland recharge and discharge areas might be something for the groundwater working group to consider in its work. Similarly sensitive and at risk plants and animals that are reliant on wetlands might also be mapped and utilized in future wetland conservation activities. The WG discussed whether there were any future opportunities to mitigate the pressures on wetlands in the Peace-Slave watershed. They identified the following:

- Regional, watershed and municipal planning processes that balance cultural, social, economic and ecological outcomes and identify and protect environmentally significant areas including important wetlands
- Forest management planning and integrated resource management planning to reduce impacts (e.g. Wapiti Corridor Planning, Sturgeon Lake - Puskwaskau Integrated Resource Plan, etc.)
- Identifying public lands (bed and shore) when land is purchased (on title) and reducing property taxes accordingly
- Educating watershed residents about the importance of and benefits wetlands provide
- Promoting and incenting best management practices for forestry, oil and gas, mining, agriculture, acreage living, recreation, etc.
- Promoting good stewardship practices to all
- Building awareness of the existing wetland policy and compensation of losses with unlicensed drainage activities. (i.e. Implementation of the Wetland Policy)
- Developing better historical data and information about function so that we know where functionally significant or sensitive wetland areas are for protection, restoration, etc.

Wetland Management Tools

Through presentations and discussions, the WG learned of the various tools currently available to manage wetlands.

A New Policy

New to the wetland management toolbox is the *Alberta Wetland Policy* approved by cabinet and released in 2013. This policy replaces the *Interim Policy for the Settled Area* and now covers the entire province. It is early days and effectiveness of the new policy is yet to be tested, particularly in the Green Area and for all boreal wetlands (bog, fen and swamp), for which there is no previous management experience to draw from and for which the policy only comes into effect in June 2016.

The policy provides strategic direction and tools to make informed management decisions. The goal is to conserve, restore, protect and manage Alberta's wetlands to sustain benefits they provide to the environment, society and the economy. Outcomes include the following:

- Wetlands of the highest value are protected for the long-term benefit of all Albertans.
- Wetlands and their benefits are conserved and restored in areas where losses have been high.
- Wetlands are managed by avoiding and minimizing negative impacts and, where necessary, replacing lost wetland value.
- Wetland management considers regional context.

Existing Legislation

All water in Alberta belongs to the Crown and is administered under the *Water Act.* Similarly, the bed and shore of most naturally occurring permanent waterbodies also belong to the Crown and are administered under the *Public Lands Act.*

Regulatory approval under the *Water Act* and/or the *Public Lands Act* is required to drain, fill in or undertake an activity in a wetland, or to alter or impact the bed or shore of a Crown-owned water body. A Crown claimable water body does not cease to be Crown claimable if it was drained or filled without authorization.

Although not new, the above legislation, in watersheds throughout Alberta, is often not well known or understood. Often, compliance is initiated only if there has been a complaint / damage to a neighboring property.

Definition of a Crown Wetland: The wetland must be permanent, (or reasonably so). The wetland feature must have a persistent inundation period but need not be perpetually or continuously inundated. Wetlands normally respond to changes in annual climate through a well-defined cycle and may from time to time become dry during periods of low precipitation followed by another period of inundation. Their boundaries will vary over time as well. (Guide for Assessing Permanence of Wetland Basins).

Land Use and Watershed Planning processes

The wetland policy goal and outcomes can be realized through the development and implementation of a myriad of regional, sub-regional, watershed, sub-basin and municipal planning processes. The Upper and Lower Peace regional plans are yet to be initiated. The Lower Athabasca Regional Plan was completed in 2012 and acknowledges a connection between the Athabasca and Peace basins. The MPWA has initiated work on an integrated watershed management plan for the Peace-Slave basin but is also involved in sub-basin planning and restoration work in the Wapiti, Heart and Redwillow sub-basins.

Municipalities have a long history of developing municipal development plans. Current review of the *Municipal Government Act* may add or improve existing tools such as environmental reserves for protecting wetlands and other environmental values within municipal boundaries. Note that the federal government also partakes in planning and has developed a Wood Buffalo National Park management plan. Additionally, agriculture and industry often participate in other forms of planning including integrated resource management planning, forest management planning and even environmental farm planning. Many industry plans include the use of wetland management tools such as codes of practice, best management practices, continuous improvement, certifications, etc.

Key to the above is figuring out what the wetland policy outcomes look like in the "regional context" of the Peace-Slave watershed and the setting of shared wetland management objectives consistently in the development of plans at all scales such that objectives are successfully achieved as plans are implemented. This has not yet occurred in any other WPAC watershed in Alberta but such alignment and integration between planning jurisdictions is occurring in some areas such as the Vermilion River sub-basin, Parkland County, etc.

Within the City of Grande Prairie, residents enjoy Bear Creek, Bear Reservoir, Crystal Lake and a number of smaller wetlands and waterbodies located within their boundaries. The City recognizes the value of its wetland and riparian lands for recreation as well as for flood and water quality management. Hence, they work to protect these areas through municipal planning processes and tools like environmental and municipal reserves. The City also engages in wetland education and outreach and last year (2015), held a wetlands information session for residents. As a growing urban metropolis, it is important that this proactive approach to wetland management continue to be supported.

Landowner Stewardship programs and Incentives

Across Alberta, the GOA, agriculture groups and conservation agencies like Ducks Unlimited Canada (DUC) continue to work with landowners to advance wetland stewardship through initiatives including education and awareness, voluntary programs, and/or incentives to encourage wetland conservation, restoration, and protection. Alberta Environment and Parks (AEP) is working with stakeholders to explore opportunities for enhanced wetland stewardship. Currently, this includes the creation of a

wetland offset program. Agriculture and Forestry administers the Growing Forward 2 program which provide several funding opportunities for various stewardship activities. The MPWA and its agricultural partners can help build awareness of these programs in the Peace-Slave watershed.

Alberta's Wetland Mitigation Directive

As per the Alberta Wetland Mitigation Directive, the province has taken a tiered approach of avoidance, minimization or replacement in order to achieve the wetland policy outcomes. This approach also assigns a value to wetlands for calculating replacement ratios. Hence proponents must now document how they attempted to avoid or minimize affecting a wetland. If avoidance is not possible, proponents must submit an application for a *Water Act* and / or *Public Lands Act* approval. After assessing the value of the wetland to be lost, replacement costs can be paid into a fund held by the province, who in turn will decide where restoration, enhancement, construction or other non-replacement activities (e.g. research, education, etc) will occur. For more information about mitigation and other tools being developed, see Alberta Wetland Policy Implementation.

Pertinent to the Peace-Slave watershed is that the policy is a go-forward policy and hence, will not affect previous *Water Act* approvals for large projects already in play in this region. In addition, replacement only comes into play if there is permanent wetland loss. For projects where wetland reclamation will occur, however far ahead in the future, up-front replacement will not be required. Given the time scale of some projects (50+ years), and the current unknowns around restoring peat wetlands, what the benefits of this management tool in the Green Area will be is uncertain. To alleviate this uncertainty, the GOA, working with the MPWA and its partners, might encourage researchers to model future potential scenarios around wetland loss (temporary and permanent) in a variety of different future economic outlooks. Priorities should also be given to research on wetland reclamation and on projects that could mitigate negative impacts on wetlands through planning and innovative construction.

Wetland Restoration

Finally, a wetland management tool in areas of high wetland loss or impaired functions (e.g. like groundwater recharge) is wetland restoration or enhancement. Areas of high wetland loss in the White Area of the Peace-Slave watershed are the more morainal lands along the river systems. Some examples of areas like this would be northeast of Rycroft (on the south side of the Peace River), around Eaglesham and in the Culp areas (which is on the east side of the Smoky River, east of Watino). DUC has been active in these areas for decades and has several projects, particularly under the *Prairie Care* program, where drained wetlands have been restored to natural. (Note however, this is mostly mineral wetlands. Peatland restoration and reclamation is still early stage and lacks consistent and effective solutions.)

Restored wetlands are often protected by voluntary land stewardship, or by placing the wetland under a more formal land conservation easement. More recently, DUC has begun collaborating with Alberta Conservation Association (ACA) and other stewardship groups and individuals to manage these conserved wetlands. DUC has also played in the past, and continues today, a large education and outreach function across the watershed and the province.

RECOMMENDATIONS

After learning about the wetland topics discussed above, the WG was asked "What do wetlands look like in the Peace-Slave watershed in the future? The WG answered that wetlands will be:

- Sustainable (healthy, functional and resilient);
- Available to indigenous and other peoples for spiritual and cultural activities;
- Managed adaptively using benchmarks to measure progress in achieving clearly-defined objectives;
- Balanced with other social, economic and environmental values; and
- Monitored (i.e. both area and function) in order to understand future status and trends.

From this discussion, the WG came up with a wetland goal for the Steering Committee to consider guiding future work in this area as follows:

"In the Peace-Slave watershed, the state and functions of wetlands is well understood and human activities affecting wetlands are mitigated (avoid, minimize or replace) such that wetlands and their associated benefits are healthy (ecological integrity is maintained), resilient and sustained on the landscape for current and future generations."

The WG then discussed at length what they would do to improve current wetland management. Suggested actions were many but can be grouped into the following six objectives:

1.0 Baseline information supports knowledge-based decision-making and adaptive management.

The lack of historical benchmark data, as well as the documentation of changes over time, makes it challenging to know what wetlands should look like on the landscape today. This is particularly true for wetlands in the Peace-Athabasca Delta and for areas that have undergone extensive land conversion. Going forward, we need to benchmark the current type and distribution of all wetlands in the Peace-Slave watershed. The Alberta Merged Wetland Inventory is a start. Now we need a strategy to fill missing gaps including areas (federal parks, recent fires), types (Shallow Open Water, Ephemeral waterbodies) and accuracy (via ground-truthing, improved GIS technology. Additionally, we need to be able to monitor and assess changes over time. This could be done by iterative mapping initiatives and could coincide with MPWA state of the watershed reporting. Where resources are limited, benchmarking, monitoring and assessing could be started in those sub-basins that are likely the most affected, the Upper Peace and Smoky-Wapiti, and then rolled-out to other sub-basins. The provincial government, through AEMERA, is likely to develop mechanisms for monitoring and assessing the successful implementation of the wetland policy. Ideally, partnerships could build on this work that would see the inclusion of indigenous knowledge and perhaps citizen science. It is also important to improve our understanding of wetland functions, connectivity and downstream effects where wetland areas are impaired (e.g., the Redwillow watershed) or vulnerable to future wetland loss or alteration (e.g., wetlands associated with groundwater recharge and discharge).

2.0 Everyone in the watershed is knowledgeable about wetlands and their social, economic and environmental value. Not only is education and outreach about wetlands and the benefits they provide important, it is also important that governments, landowners, industry and the public are aware of what they can do to avoid impacting wetlands.

3.0 Everyone in the basin is aware of the provisions of the *Water Act, Public Lands Act* and the *Wetland Policy* and all other relevant legislation (e.g. SARA) related to managing human activities around wetlands. Governments, landowners, industry and the public also need to understand how wetlands are managed and the tools, such as the *Water Act*, used to do so. Education is also an important component of compliance and enforcement programs.

4.0 Landowners and land users are incented to be good stewards and conserve wetlands. Landowners and land users have to balance social, economic and environmental costs and benefits. As society also often benefits, landowners and land users should not bear the costs alone. Hence, we need a fair, level playing field that is knowledge-based and that incentivizes wetland conservation. While tool and programs exist in the south, greater awareness of these are needed throughout the Peace-Slave watershed.

5.0 In areas of high loss, drained or degraded wetlands are restored. We need to determine what is meant by "areas of high loss" as this could include wetland number, wetland cover or wetland function. For marshes in the White Area, restoration has been proven. A greater challenge will be restoring peatlands and swamps. The MPWA can play a role in encouraging the GOA and facilitating partnerships to move forward on this proactively, rather than playing catch-up in the future, by encouraging the avoidance and minimization of disturbances in all wetlands going forward, and promoting work to restore these wetlands where needed.

6.0 Exceptional wetlands are protected. While the GOA has a valuation process to identify high value wetlands (mainly for mitigation/replacement purposes), other exceptional / important, wetlands might be protected for other social, economic or environmental reasons. The MPWA can help determine watershed-wide criteria for determining what is exceptional and can develop a process for identifying and protecting these wetlands.

Further strategies, actions, leads, partners and timelines, for each of the outcomes above is detailed in a proposed wetland workplan (Table 2).

In addition to the wetland workplan, the WG also made a number of recommendations to the Steering Committee as they move forward with the IWMP as follows:

- Wetlands are an important component of watersheds and are closely tied to other IWMP topics such as water quality and quantity, mainstem flow, groundwater protection, etc. Ensure these important connection points are made in the work of future groups and in the IWMP

- Be sensitive to the differences between the White and Green Area (one size does not fit all). Also, note that the continuity of "boreal" which is part of several neighboring regional plans as well as national and international commitments (e.g., Canadian Boreal Forest Agreement).
- Recognize First Nations and Métis connection to the watershed, wetlands and quality of life, particularly in the Green Area.
- Recognize and protect environmentally significant areas such as wetland complexes (e.g. Hay-Zama, Peace-Athabasca Delta, etc.).
- In developing and implementing the IWMP, also consider other important values such as species at risk/biodiversity, sustainable agriculture, sustainable forestry, existing land use commitments, etc.
- Recognize the challenge of managing cumulative impacts / footprint and be prepared for these impacts to magnify. Make the IWMP flexible and able to adjust as we learn.
- Be prepared for climate change and variability by being adaptive and timely including:
    - Monitoring, assessing and reporting annually
    - Adapting if necessary (be nimble and responsive to new knowledge as it is collected)
    - Being clear on the process for plan implementation
    - Being creative in resourcing (e.g., consider a levy)
- Continue to seek sector input and feedback into the IWMP process (including agriculture, forestry, regulators, peat harvest and mining, First Nations, Métis, governments, etc.).
- Continue to participate in other planning processes. Work with AEP to ensure there is a clear process for IWMP and other MPWA information to be fed into the LUF Upper and Lower Peace planning processes and the upcoming review of the Lower Athabasca Plan. Support municipalities and industry in their planning processes, to the extent that capacity allows ensuring wetland objectives are shared by all authorities and consistently implemented on the landscape.
- At a future date, when more is known about the current state of wetlands in the Peace-Slave watershed, consider amending the IWMP to include specific wetland management objectives for each sub-basin. These could be quantitative (increase by 5%) or directional (maintain, increase).

Table 2. MPWA Integrated Watershed Management Plan – Wetlands and Wetland Loss

Wetland Vision: In the Peace-Slave watershed, the state and functions of wetlands is well understood and human activities affecting wetlands are mitigated (avoid, minimize or replace) such that wetlands and their associated benefits are healthy (ecological integrity is maintained), resilient and sustained on the landscape for current and future generations.			Actions to be initiated and completed within short (2 yrs) medium (5 yrs) or long (10 yrs) terms.		
OUTCOMES	**STRATEGIES**	**ACTIONS**	**Lead**	**Other partners**	**Time**
1.0 Baseline information supports knowledge-based decision-making and adaptive management.	1.1 Develop good baseline information including an accessible GIS wetland inventory with both surface water delineation and sub-surface flows (i.e. groundwater connection).	1.1.1 Build on existing MPWA, GOA and GOC (WBNP) wetland inventories to develop complete baseline data for the Peace-Slave watershed (and possibly the Hay and Liard watersheds) including information on WBNP, Shallow Open Water, current and historical distribution, type, areas of loss, and areas for restoration. Use AVI, Lidar, TEK, ground truthing, industry data, etc. to improve maps.	MPWA	GOA-AEP, GOC-WBNP, DUC, industry, Boreal Forest Conservation Initiative	Long
	1.2Define and monitor wetland health and periodically assess the state of wetlands.	1.2.1 Work with the GOA-AEP, GOC-PC and AEMERA-ABMI to determine criteria, protocols, etc. and incorporate into MPWA state of reporting.	MPWA	GOA-AEP, AEMERA-ABMI	Long
	1.3 Set benchmarks and determine management objectives to guide future work in an iterative and adaptive process via the IWMP process.	1.3.1 Determine appropriate time period(s) for benchmarks (e.g. current, pre-settlement, etc.) depending on the questions that need answering. Start in higher impacted sub-basins including the Upper Peace and Smoky-Wapiti.	AEP, AEMERA	First Nations, AAF	Short
		1.3.2 Continue to explore wetland management options meaningful to stakeholders going forward perhaps by modelling future disturbance footprint (temporary and permanent loss), climate change, etc.	MPWA	All sectors	Long
	1.4 Improve our understanding of the ecology of wetlands in the watershed including the goods and services they provide recognizing these might be affected by cumulative effects and climate change.	1.4.1 Determine research priorities (e.g. impact of wetland loss on aquifer recharge or species at risk; carrying capacity, etc.), partners, etc. in a research strategy. Glean learnings from White Area wetland research but encourage new research to focus on the Green Area (boreal) wetlands.	MPWA	Alberta Innovates, academia, researchers, DUC, industry	Medium
		1.4.2 Develop a TEK study of wetland uses and importance and historical distribution.	Tribal Councils / MPWA, GOA, etc.	GOA – Indigenous Relations, AEMERA, GOC-PC	Medium

Wetland Vision: In the Peace-Slave watershed, the state and functions of wetlands is well understood and human activities affecting wetlands are mitigated (avoid, minimize or replace) such that wetlands and their associated benefits are healthy (ecological integrity is maintained), resilient and sustained on the landscape for current and future generations.			Actions to be initiated and completed within short (2 yrs) medium (5 yrs) or long (10 yrs) terms.		
OUTCOMES	**STRATEGIES**	**ACTIONS**	**Lead**	**Other partners**	**Time**
2.0 Everyone in the watershed is knowledgeable about wetlands and their social, economic and environmental value.	2.1 Strike an education committee to develop and implement a general wetland education and outreach plan.	2.1.1 Model this education and outreach plan on the University of Saskatchewan Delta Dialogue Network: an example of knowledge building and sharing and knowledge mobilization. Target municipal councils, ag service boards, industry, the public, etc. (take a triage approach to determining sector priorities.)	MPWA	Cows and Fish, DUC, ACA, Nature Alberta	Medium
		2.1.2 Provide input to AEP as they review and renew the Alberta Education wetland curriculum (Webbed Feet Not Required) to focus more on wetland management in a northern context. Assist AEP with curriculum delivery and promotion throughout the Peace.	MPWA	AEP Education and Outreach Group; school districts, Grande Prairie Environmental Sciences Education Society and other forest education societies	Long
		2.1.3 Engage post-secondary and professional organizations in the Peace-Slave watershed in wetland education and outreach.	MPWA	NAIT Boreal Institute, etc.	Medium
	2.2 Communicate the state of wetlands and wetland trends.	2.2.1 Integrate wetland state of reporting into the MPWA state of reporting process.	MPWA	AEMERA, ABMI	Long
	2.3 Ensure wetland education and outreach products are available.	2.3.1 Use multiple platforms for information sharing (see www.wetlandsalberta.ca)	MPWA	DUC	Short

Wetland Vision: In the Peace-Slave watershed, the state and functions of wetlands is well understood and human activities affecting wetlands are mitigated (avoid, minimize or replace) such that wetlands and their associated benefits are healthy (ecological integrity is maintained), resilient and sustained on the landscape for current and future generations.			Actions to be initiated and completed within short (2 yrs) medium (5 yrs) or long (10 yrs) terms.		
OUTCOMES	**STRATEGIES**	**ACTIONS**	**Lead**	**Other partners**	**Time**
3.0 Everyone in the basin is aware of the provisions of the *Water Act, Public Lands Act* and the *Wetland Policy* and all other legislation (e.g. SARA) related to managing human activities around wetlands.	3.1 Develop a more specific awareness campaign around the new Wetland Policy and policy implementation tools targeted specifically at sectors operating in the Peace-Slave watershed.	3.1.1 Identify priority target audiences (e.g. municipalities, peat mining, road building, agriculture and industry associations, etc.), key messages and appropriate communication tools (e.g. field extension, social media, etc). Resource campaign implementation with wetland offset dollars.	GOA (AEP, A&F)	Municipalities, industry, professional associations, consultants, etc.	Medium
	3.2 Ensure land owners / land users operating in the watershed are knowledgeable about and comply with legislation.	3.2.1 Develop an education, compliance and enforcement program.	AEP, AER, A&F	Agriculture, Industry	Medium
		3.2.2 Work with agriculture and industry to set shared wetland objectives in an IWMP that they can achieve (carrot rather than the stick) above the regulatory backstop. Ensure there is awareness of existing and new incentive programs.	MPWA	Industry, agriculture	Medium
4.0 Landowners and land users are incented to be good stewards and conserve wetlands.	4.1 Promote stewardship with various user groups.	4.1.1 Work with off-roading /all terrain vehicle users to promote stewardship. See *Tread Lightly on the Tundra* model.	AEP	WPACs, Users, retailers, recreation groups	Short
		4.1.2 Work with Agriculture to improve understanding of the economic benefits of wetlands and the ecological goods and services they provide and to implement BMPs.	AAF, municipalities	GOA (Ag groups, Ag field men AAF, Cows and Fish	Medium
		4.1.3 Work with industry to promote stewardship tools such as BMPs, Codes of Practice, biodiversity and conservation offsets, etc.	GOA, WPACs	industry; see DUC BMP work	Medium

Wetland Vision: In the Peace-Slave watershed, the state and functions of wetlands is well understood and human activities affecting wetlands are mitigated (avoid, minimize or replace) such that wetlands and their associated benefits are healthy (ecological integrity is maintained), resilient and sustained on the landscape for current and future generations.			Actions to be initiated and completed within short (2 yrs) medium (5 yrs) or long (10 yrs) terms.		
OUTCOMES	**STRATEGIES**	**ACTIONS**	**Lead**	**Other partners**	**Time**
5.0 In areas of high wetland loss or degradation, wetlands are restored.	5.1 Understand the relationship between the Peace main stem flow regime, the health of wetlands in the PAD, and the quality of life of local inhabitants and promote the operation of flows to preserve this relationship.	5.1.1 Create a multi-stakeholder committee to provide their perspective and advice to the AB-BC Transboundary Negotiation teams.	GOA, GOC (PC,EC)	MPWA, First Nations, AB-BC Trans-boundary Negotiating teams	Medium
		5.1.2 Examine pre- (natural), post-dam and current desired flow and develop potential options/scenarios to manage the flow of the Peace for the health of people and wetlands in the PAD.	GOA, GOC (EC and PC)	GOC, MRBB, bilateral negotiators, etc.	Medium
	5.2 Define what is meant by “areas of high wetland loss” in the Peace-Slave basin context and map the occurrence of any such high loss areas.	5.2.1 From the baseline maps developed in outcome #1, look at historical loss. Using a triage approach, define and map areas of high loss. The definition could be number of wetlands, areal cover, loss of functions, etc. It could also be different in different sub-basins, depending on the regional context. Work should be started in the sub-basins with the highest footprint (Upper Peace, Smoky Wapiti).	DUC	MPWA	Medium
	5.3 Partner with land trusts and other land stewards (DUC, TNC, ACA, Parks Canada, First Nations, forest industry, etc.) to conserve wetlands.	5.3.1 Strengthen communication between forestry and FN (re operational planning).	Forestry Sector	First Nations	Medium
		5.3.2 Promote and support land trusts by encouraging them to operate in the Peace-Slave watershed and linking them to potential donors.	MPWA	MPWA partners	Short
	5.5 Conduct a regional strategic environmental assessment as a tool to model scenarios/ management options to achieve outcomes.	5.5.1 Modelling scenarios will likely be a part of the LUF regional planning processes, and hopefully will include stakeholder input into what are culturally and environmental significant areas and features in the Peace-Slave watershed.	GOA	ENGOs and industry, GOC, municipalities	Medium

Wetland Vision: In the Peace-Slave watershed, the state and functions of wetlands is well understood and human activities affecting wetlands are mitigated (avoid, minimize or replace) such that wetlands and their associated benefits are healthy (ecological integrity is maintained), resilient and sustained on the landscape for current and future generations.			Actions to be initiated and completed within short (2 yrs) medium (5 yrs) or long (10 yrs) terms.		
OUTCOMES	**STRATEGIES**	**ACTIONS**	**Lead**	**Other partners**	**Time**
	5.6 Explore a conservation offset strategy (tie carbon sequestration, biodiversity, etc)	5.6.1 Explore FN collaborative involvement as stewards of offsets (i.e. examine the option of managing lands complementary to existing tenures for conservation values where we could fund First Nations to manage lands for biodiversity and other conservation values).	GOA	FN, ENGOs, industry	Medium
	5.7 Develop a runoff /non point source strategy to mitigate the impacts on receiving waterbodies including wetlands.	5.7.1 Encourage the use of tools like riparian setbacks, environmental reserves and incentives as a means of managing erosion and surface water run-off (NPSP) for the protection of source water quality and to protect high value wetlands.	MPWA	MPWA partners, GOA,	Long
6.0 Exceptional wetlands that are socially, economically and/or environmentally significant are protected.	6.1 Define what is an exceptional wetland (develop criteria) and inventory where they are including delineation and ownership.	6.1.1 With a group of stakeholders, research other jurisdictions to see if criteria already exist before setting Peace-Slave specific criteria.	MPWA	industry, FN, municipalities, ENGOs	Short
		6.1.2 Apply criteria to base line data developed in outcome #1 to identify and map exceptional wetlands. Alternatively, explore a nomination process approach similar to Alberta's Special Places 2000 program.	MPWA	GOA-AEP	Medium
	6.2 Work with governments, land trusts, landowners, etc to protect exceptional wetlands.	6.2.1 Provide incentives to landowners to protect private lands around designated exceptional wetlands possibly through programs such as ALUS, tax relief, conservation easements, Growing Forward II, etc.	DUC	MPWA, AAF, Conservation agencies	Long
		6.2.2 During environmental impact assessments of project proposals that have potential impacts on exceptional wetlands, assess project specific and cumulative impacts against pre-development baseline conditions.	AER, GOC	GOA, industry	Long

APPENDIX 1 – WORKING GROUP MEMBERSHIP

Name	Surname	Job Title or Perspective	Affiliation
Garth	Davis	Energy Industry	ConocoPhillips
Joe	Hustler	mining	Knelsen Sand and Gravel
Eric	Jorgensen	Municipal Counselor	Mackenzie County
Stuart	MacMillan	Peace-Athabasca Delta Ecological Monitoring Program	Wood Buffalo National Park, Parks Canada
David	Matheson	Conservation Organization	Ducks Unlimited Canada
Amber	Moskalyk	Producer	Agriculture
Jason	Straka	Ecologist	Parks Canada
Gilmen	Cardinal	Traditional Use	Bigstone Cree
Chris	Thiessen	Urban municipality, MPWA – IWMP Steering Committee	City of Grande Prairie
Marsha	Trites-Russell	Wetland Specialist	Alberta Environment & Parks
Jim	Webb	Aboriginal Perspective on wetlands	North Peace Tribal Council
Ian	Whitby	Forest Planner	Tolko
Bin	Xu	Research Chair	NAIT Boreal Research Institute
Petra	Rowell	Project Manager	Consultant
Adam	Norris	Project Coordinator	Mighty Peace Watershed Alliance
Megan	Graham	Communication and Education	Mighty Peace Watershed Alliance
Dave	Doucet	Recorder	Consultant
Elaine	Garrow	Alternate	City of Grande Prairie
Baptiste	Metchooyeah	Alternate	North Peace Tribal Council
Dave	Beck	Alternate	Knelsen Sand and Gravel

APPENDIX 2 – TERMS OF REFERENCE

Integrated Watershed Management Plan Working Group

Terms of Reference

The following document describes the purpose and structure of the working groups including what they should achieve, who will participate, how work will be done and when it will be completed. The Board of Directors approved these Terms of Reference on

Context

The Mighty Peace Watershed Alliance Society (MPWA) is a multi-stakeholder not-for-profit organization registered under Alberta's Society Act. The MPWA is one of several *Watershed Planning and Advisory Councils* created under Alberta's *Water for Life* strategy. The MPWA is committed to achieving and implementing the three goals of the strategy:

- Safe, secure drinking water supply
- Healthy aquatic ecosystems
- Reliable, quality water supplies for a sustainable economy.

The implementation of these goals is guided by the vision, mission and shared values of the MPWA:

Vision – The Peace is a healthy, sustainable watershed that supports our social environmental and economic objectives.

Mission – To promote watershed excellence, the Mighty Peace Watershed Alliance will monitor cumulative effects from land use practices, industry and other activities in the watershed and work to address issues through science, education, communication policy and by supporting watershed stewardship.

Shared Values - The Mighty Peace Watershed Alliance will:

Respect a diversity of peoples and values	*By demonstrating individual and collective respect for the air, land and water and by appreciating the diversity of values and opinions found in the Peace watershed.*
Be an ambassador	*By promoting our vision and mission, demonstrating integrity, accountability and practicality, and practicing effective communication, knowledge-building and consensus decision-making.*
Be a trustworthy and credible source of information	*By being well-informed and providing sound advice through an adaptive watershed approach that integrates traditional local and scientific knowledge in information-gathering and problem solving.*

Be fair and transparent to all	*By seeking balanced representation and listening to all stakeholders in an open, transparent manner.*
Be inclusive and collaborative	*By facilitating inclusive and collaborative processes and partnerships, promoting membership and interaction and providing opportunities for all stakeholders to be involved.*
Be action-oriented and innovative	*By being motivated, resourceful and action-oriented in finding new, innovative ideas and win-win strategies.*
Foster stewardship	*By encouraging and enabling individuals and organizations to be good stewards of the watershed.*

Objectives

The working groups will work through the Issues of Concern as directed by the Integrated Watershed Management Plan Steering Committee (IWMP SC) in a consensus process. The end goal for each Issue of Concern is a set of concrete recommendations to the IWMP SC on how to improve water quality and quantity in pursuit of the 3 goals of the *Water for Life* strategy. This includes statements about the Issue of Concern and potential options for addressing this, which are ranked.

Working Group Task

1. To review the information presented by the Integrated Watershed Management Plan Steering Committee (IWMP SC), review and assess for completeness and data gaps.

2. The working group will ensure that Issue of Concern is properly framed through discussion and brainstorming.

3. The working group will develop statements for their assigned Issues of Concern to clarify and frame the issue. Subsequent to this, the working group will identify and evaluate potential management options of how to address the issues.

4. Finally, recommendations will be made by the Working Group to the IWMP SC on how best to move forward on their designated Issue of Concern. This recommendation will include ranked management options and indications of the consensus achieved within the Working Group.

What is in scope?

The IWMP SC will indicate to each working group what the Issue(s) of Concern they are to deal with is/are. Each issue is to be considered, diagnosed and potential management options for addressing are to be sought out, collected and evaluated. Please see Appendix I for more detail on each Issue of Concern.

What is out of scope?

Issues of Concern not assigned to a particular Working Group are out of scope, as is engaging

consultants without the approval of the IMWP SC or implementation activities. The Working Groups will not engage is lobbying or promotion of a particular management option.

Membership

1. Membership of the Integrated Watershed Management Plan Working Groups must be approved by the IWMP SC and shall consist of the following classifications:

- Wetland policy expert (green zone)
- Wetland policy expert (white zone)
- Municipal member
- Energy Regulator
- Forestry industry member
- Energy Industry member
- Peace Athabasca Delta Ecological Monitoring Program representative
- Aboriginal Traditional Use member
- Ducks Unlimited
- IMWP SC member
- Academic
- Aboriginal perspective on wetland policy

2. The Working Group can, with approval from the IWMP SC, call upon the expertise of people outside the Working Group and outside the MPWA.

Meetings

Meetings will be set as required and notification will be provided electronically.

Reporting

1. The Working Groups is responsible to and reports to the Integrated Watershed Management Plan Steering Committee, which in turn is responsible to and reports to the MPWA board (MPWA Process Guide section 6.1).

2. The Working Group will report to the IMWP SC after every meeting and the IWMP SC will report to the Board at minimum at every regular Board meeting.

Quorum

A simple majority of committee members shall constitute quorum.

Delegation

The Working Group may, with permission from the IWMP SC, delegate tasks to other qualified individuals or groups.

Timelines

The Working Group will convene in December 2015 and complete their work by March 2016.

Appendix I – Comments and questions for each Issues of Concern

Wetlands and wetland loss

1. Confirm data gaps
2. Gather missing data
3. Document wetland loss activities
4. Explore impact of wetland loss – both on wetlands and downstream of wetlands
5. Consequence of wetland loss
6. Examine what the wetland will look like the future
7. Alternatives to wetland losses – mitigation/reduction
8. Application of Alberta Wetland Policy
9. Effectiveness of the Alberta Wetland Policy and gaps therein
10. Geographically important wetland loss (hot spots)
11. Degrees/gradient of wetland loss
12. Definition of wetlands and its consistent use
13. Quantification and accounting of wetland value
14. People for whom the wetlands are important (socio-economic)
15. Restoration of wetlands, the need for restoration and the offsets for industrial development