Plan of Study
To be submitted by the International Elk-Kootenai/y Watershed Study Board To the International Joint Commission

January 31, 2025

Executive Summary

In March 2024, the International Joint Commission (IJC) received a Reference under the Boundary Waters Treaty from the governments of the United States and Canada, in partnership with the Ktunaxa Nation, asking the IJC to carry out certain actions to address the impacts of transboundary water pollution in the Elk-Kootenai/y watershed. In September 2024, the IJC appointed the International Elk-Kootenai/y Watershed Study Board (IEKWSB) and then directed the IEKWSB to conduct transparent and coordinated transboundary data and knowledge sharing; share, synthesize, and analyze data and information to support a common understanding of pollution within the Kootenai/y watershed and the impacts of that pollution on people and species; and report results and make recommendations in a transparent and publicly available format.

The IEKWSB has developed a Plan of Study which describes how it will work with a Council of Indigenous Knowledge Holders (CoIKH), with the support of a Study Management Team to accomplish the Directive from the IJC. The IEKWSB will establish four Technical Working Groups (TWGs) to provide the technical foundation for its work, with advice from two Advisory Groups and review by an Independent Review Group established by the IJC. The TWGs will be established to assist in carrying out the work under this Directive to "*support a common understanding of pollution within the Elk-Kootenai/y watershed. This includes the impacts of that pollution on people and other species*" focused on the following four topics:

- Water Quality Status and Trends
- Impacts to Human Health and Well-Being
- Impacts to Ecosystems, Including Cumulative Effects
- Mitigation Efforts and Activities and Available Tools

Given that Ktunaxa knowledge and language flows through all TWG themes, the recommendation from the CoIKH is that there be interaction across the CoIKH and each of the TWGs with the option for support from staff from Ktunaxa governments as needed and available within the TWGs.

As required by the Directive, the IEKWSB will provide the IJC with an interim report on its progress in September 2025 and a final report in September 2026 which will include a Phase 2 Plan of Study to follow up on this initial study. The Board is requesting $4.9 million in funding to accomplish the Directive.

Contents

1 Preamble

As a transboundary water, the Elk-Kootenai/y watershed is subject to the Boundary Waters Treaty of 1909 between Great Britain and the United States which is intended to prevent and resolve disputes over the use of the waters shared by Canada and the United States. The treaty established the International Joint Commission (IJC) to help the two countries carry out its provisions when issues are referred to the IJC by the countries.

The Elk-Kootenai/y watershed is defined in this Plan of Study (POS) as the Kootenai/y River flowing through Canada and the United States to its confluence with the Columbia River downstream in Canada, the Elk River sub basin, Koocanusa Reservoir, and Kootenay Lake. Stressors originating in other tributaries will be considered as part of the assessment of the cumulative stress on the watershed as defined in the Directive. The entire watershed is in the unceded territory of the transboundary Ktunaxa Nation and is central to the Ktunaxa Creation Story. The Ktunaxa Creation Story has been passed down orally for generations amongst the Ktunaxa people and elders. Several websites share a short rendition of the Ktunaxa Creation Story (for example: Creation Story : Ktunaxa Nation) but the telling of the story in its entirety takes days.

On March 8th, 2024, the Governments of the United States and Canada, joined by the transboundary Ktunaxa Nation, sent letters to the International Joint Commission (IJC), that included a shared "Proposal to Address Transboundary Water Pollution in the Elk-Kootenai/y Watershed." The proposal was developed in partnership by Ktunaxa, Canada, and the United States, with support from the Province of British Columbia and the states of Montana and Idaho. In accordance with Article IX of the Boundary Waters Treaty of 1909, the Governments of the United States and Canada requested the IJC to take actions as described in the Preamble of their joint Proposal with the Transboundary Ktunaxa Nation.

As per the Proposal, the Nations requested the "IJC to convene experts and knowledge holders in an IJC Study Board to conduct transparent and coordinated transboundary data and knowledge sharing", and to develop a Plan of Study (POS).

2 Acknowledgements

This POS was written by the International Elk-Kootenai/y Watershed Study Board (IEKWSB) and Study Management Team (SMT) and contributions from the Council of Indigenous Knowledge Holders (CoIKH) - Council of Ksanka ɛ Ktunaxa Knowledge Holders (CoIKKH). The members of the IEKWSB were appointed by the IJC to provide the expertise needed to develop and guide the scientific activities and tasks required to complete this POS. Although IEKWSB members are currently or may have formerly been employed by government agencies in both Canada and the United States, all members have agreed to serve objectively in their personal and professional capacities, and not as representatives of their current or former agencies, countries, organizations, or special interest groups.

3 Introduction

The Kootenai/y Basin covers parts of southeastern British Columbia, northwestern Montana, and northern Idaho, all of which are part of ʔamakʔis Ktunaxa (Ktunaxa Territory) (Figure 1).The Elk-Kootenai/y watershed Reference is the first Reference to the IJC that the two federal governments have

developed in partnership with First Nations and Indigenous groups, with signatories from Canada, the United States, and the transboundary Ktunaxa Nation1. This is particularly important because of the geography and history of the watershed.

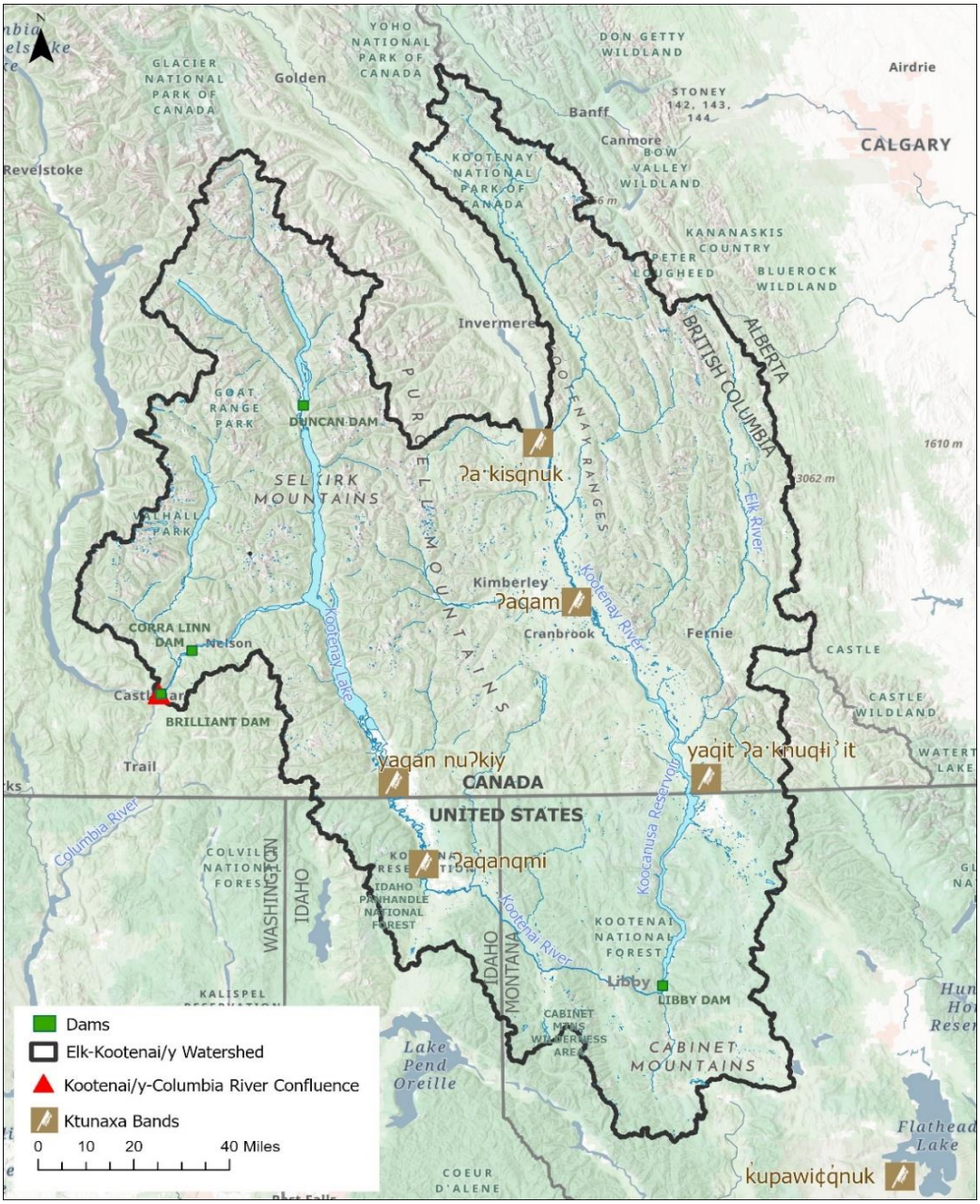

Figure 1. The Elk-Kootenai/y watershed, forming the Study Area

[1] For the purposes of this document, the Ktunaxa Nation is defined to include the six Tribal and First Nation governments: ʔa·kisq̓nuk, ʔaq̓am, yaqan nuʔkiy, Yaq̓it ʔa·knuq̓ti̓it (Tobacco Plains Indian Band), Confederated Salish and Kootenai Tribes (Ksanka Band), and ʔaq̓anq̓mi (Kootenai Tribe of Idaho).

According to the Ktunaxa Creation Story, the Kootenai/y River is central to and woven into the heart of ʔamakʔis Ktunaxa (Ktunaxa Territory). The headwaters of the Kootenay River flow from the Ktunaxa land district of kyawa¢ ʔamakʔis (Land of the Spruce Goose; known as Kootenay National Park in southeastern British Columbia) and the ʔakisq̓nuk First Nation, before flowing south through ʔaknuqǂuǂam̓ ʔamakʔis (Land of the Eagle) and the First Nation of ʔaq̓am. From there it receives flows from the Elk River (from qukin ʔamakʔis (Land of the Raven)) and flows downstream through Ƛam̓na ʔamakis (Land of the Wood Tick) and the First Nation of Yaq̓it ʔa·knuqɬiˀit.

The river continues its journey through ʔamakʔis Ktunaxa (Ktunaxa Territory) before crossing the international boundary between Canada and the United States, into Montana. The Kootenai River then flows through the Ktunaxa territories of kˀupawi¢q̓nuk (Ksanka Band, Confederated Salish and Kootenai Tribes of the Flathead Indian Reservation in Montana) and ʔaq̓anqmi (Kootenai Tribe of Idaho near Bonners Ferry, Idaho) before turning north and crossing the international boundary back into Canada, flowing through the First Nation of yaqan nuʔkiy and into Kootenay Lake.

[under discussion with the Council of Indigenous Knowledge Holders - Council of Ksanka ⱪ Ktunaxa Knowledge Holders a map of Ktunaxa land districts may be included here for the final Plan of Study]

In October 2012, the transboundary Ktunaxa requested the Elk and Kootenai/y Rivers be referred to the IJC under Article IV of the Boundary Waters Treaty whereby "it is further agreed that the waters herein defined as boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other." Concerns about reduced water quality and quantity from ongoing and expanding coal mine operations and the implications to wildlife and fish populations as well as impacts to human health were noted to be of cultural, historic, and subsistence importance and concern to the transboundary Ktunaxa. Concerns for more impacts resulting from potential mine expansions prior to any mitigation planning or demonstrated mitigation efficacy were also highlighted.

British Columbia issued a Ministerial Order in 2013 for the development of an Area Based Management Plan to stabilize and reduce contaminants from the effluent of coal mines in the Elk Valley. The Order named increasing concentrations of selenium, cadmium, nitrate, sulphate, and deposition of calcite in the aquatic receiving environment. Many of these parameters exceeded provincial water quality guidelines and were suspected of causing impairment to ecosystem health (Ministerial Order 113). Through the approval of this Plan, commitments were made by the province (in partnership with the state of Montana) to create a Lake Koocanusa Monitoring and Research Working Group (LKMRWG) to develop a reservoir-specific selenium target. The LKMRWG was set up in 2015 and was active until 2021.

In 2017, a second request for a federal-led international response was sent by the transboundary Ktunaxa to both Federal Governments due to the narrowly scoped monitoring and research (a single water quality contaminant), and concerns for fish and wildlife due to increasing trends in water pollutants, challenges in mitigations, and more coal mine development. In 2019, in response to elevated fish tissue levels of selenium, the transboundary Ktunaxa again raised concern with the water quality and selenium impacts, requesting BC set a lower limit to protect aquatic life while the LKMRWG completed their work.

The outcome of the work done by the LKMRWG resulted in Ktunaxa leadership in British Columbia approving a site-specific selenium water quality objective of 0.85 µg/L (total Se) in the British Columbia portion of Koocanusa in September 2020 and Montana setting a selenium criterion for Koocanusa of 0.8 µg/L (dissolved Se) south of the International Boundary. The Montana criterion was subsequently approved by the United States Environmental Protection Agency (USEPA) for Clean Water Act purposes in February 2021. This created a disconnect between water quality guidelines as British Columbia's guideline is 2.0 µg/L (total Se). Following this, Ktunaxa leadership again sent letters requesting a reference to the IJC in February and December 2021. Adding to the complexity, the United States Environmental Protection Agency selenium criterion for downstream of Koocanusa Reservoir in the Kootenai River is 3.1 µg/L (total Se).

On March 24, 2023, the US and Canadian governments released a joint statement announcing a commitment to "reach an agreement in principle by this summer to reduce and mitigate the impacts of water pollution in the Elk Kootenay watershed, in partnership with Tribal Nations and Indigenous Peoples, in order to protect the people and species that depend on this vital river system."

The closure of the LKMRWG was announced by BC and Montana in December 2023, noting that the feedback in 2020 from participants in the group had outlined more work was needed in inclusive governance and a broader geographic region (the watershed rather than just the Reservoir). The transboundary work started through this group was recognized to be transitioning to a new transboundary forum as indicated by the Federal Governments of Canada and the United States.

On March 8, 2024, the IJC received a Reference under the Boundary Waters Treaty related to the March 24, 2023 statement by the US and Canadian governments, in partnership with the Ktunaxa Nation, asking the IJC to carry out certain actions to address the impacts of transboundary water pollution in the Elk-Kootenai/y watershed. The Reference was made under Article IX. This is the first Reference to the IJC that the two federal governments have developed in partnership with First Nations and Indigenous groups.

The Reference included a request to the IJC to convene experts and knowledge holders in an IJC IEKWSB by September 8, 2024, to conduct transparent and coordinated transboundary data and knowledge sharing; share, synthesize, and analyze data and information to support a common understanding of pollution within the Kootenai/y watershed and the impacts of that pollution on people and species; report results and make recommendations in a transparent and publicly available format; and broadly engage with federal, provincial, state, First Nations, Métis, and Tribal governments, industry, local communities, organizations, the public and others who live, work or have interests in the watershed, as well as other IJC boards working in the watershed or on similar issues.

3.1 Clarify relationships

The IEKWSB is aware of two other regionally important, binational/bilateral efforts: 1) the IJC's International Kootenay Lake Board of Control (IKLBC) work and 2) the United States and Canada Columbia River Treaty (CRT) negotiations. The work of the IEKWSB does not encompass the ongoing work related to either of these other efforts. The mandate of the IKLBC is complementary to (but distinct from) that of the IEKWSB. The IKLBC was created by an IJC Order in 1938 to oversee operations at Corra Linn Dam to store up to six feet of water in Kootenay Lake and to excavate the lake outlet at Grohman Narrows. The IKLBC operates under its 2016 Directive. IJC jurisdiction does not encompass the Columbia

River Treaty work. Canada and the United States reached an agreement-in-principle (AIP) in July 2024 to extend CRT operations following six years of negotiations. Created in 1961 and ratified in 1964 partially in response to the 1948 flood, the CRT provided some flood mitigation and power creation for both countries and resulted in the construction of four major dams (Duncan, Hugh L. Keenleyside and Mica in Canada and Libby in the United States) initially, with several more built since.

3.2 Watershed Characteristics

The Kootenai/y River basin is an international watershed and represents the third largest tributary of the Columbia River; of the total basin area of 19,300 miles^2 (49,987 km^2), 14,500 miles^2 (37,555 km^2) are in British Columbia, Canada, with 3,750 miles^2 (9,712 km^2) in Montana and 1,150 miles^2 (2,978 km^2) in Idaho in the United States. The Kootenai/y River is about 485 miles (775 km) long with 165 miles (266 km) or a little more than one-third of its length in the United States (adapted from ICERB, 1959 and Knudson, 1994). The watershed is largely undeveloped, with only 0.35% of the basin in development, 0.6% of the drainage area in agricultural use, and <0.25% of the basin currently under development for mining with all of that in the Elk River basin (Stickney et al., 2021; Table 1).

The Continental Divide forms much of the eastern watershed boundary, with the Selkirk Mountains on the west, the Cabinet Range to the south and the Purcell Mountains in the center of the "J"-shaped flow (Figure 1). The headwaters of the Kootenay River are in the Rocky Mountains about 40 miles (64 km) west of Banff, Alberta, and flows south into Koocanusa Reservoir which is located at the Montana-British Columbia border. Libby Dam, located on the mainstem Kootenai River near Libby, Montana, creates Koocanusa Reservoir. The dam was authorized by the U.S. Congress in the 1950 Flood Control Act for hydropower and flood protection, and construction was completed in 1973. Koocanusa Reservoir extends 90 miles (145 km) upstream into British Columbia, Canada. It has an average depth of 125 feet (38 meters), a maximum depth of 348 feet (106 meters), and a total storage capacity of 5,869,000 acre-feet (7.2 km^3) of water. Libby Dam is the fourth dam constructed under the Columbia River Treaty between the United States and Canada and it is operated by the U.S. Army Corps of Engineers. After leaving Libby Dam, the Kootenai River flows west through Montana and Idaho before flowing north into Kootenay Lake in British Columbia. The river finally flows southwest from Kootenay Lake to enter the Columbia River near Castlegar, B.C.

The Kootenay River flows are largely driven by the winter accumulation of snow in the adjacent mountain systems, with the slopes of mountain peaks 7,000 to 12,000 feet (2,134 to 3,658 m) in elevation. Generally, the elevation of the mountains is higher in the northern part of the basin than in the southern part. Winter flows are ordinarily low, but as spring progresses into summer with warmer temperatures, these accumulated snows of the preceding winter melt and cause the spring flood. Ordinarily the rise is gradual, beginning in April and continuing until late in May or June, when maximum stage occurs.

Historically, the average annual discharge of the Kootenay River to the Columbia River was 868 m^3/s (30,650 cfs); and 87% of the inflow to Koocanusa Reservoir (301 m^3/s, 10,615 cfs) comes from three Canadian rivers, the Kootenai, Elk and the Bull. Reductions in snowpack, earlier spring runoff, warming water temperatures, and reductions in annual stream flows are already evident in the Columbia River (reviewed in Chaffin et al., 2024). Warming temperatures and changes from snow-dominated to rain-dominated precipitation and changes in timing will impact flow, as well as power and irrigation demands.

Changing hydroclimatic conditions in the basin and increasing variability means that there is uncertainty in trying to understand transboundary water pollution dynamics.

Table 1. Land cover in the Kootenai/y River watershed organized by 8-digit hydrologic unit code (HUC-8) watersheds (modified from Stickney et al., 2021).

HUC-8 watershed	Area (km^2)	Agricultural (km^2)	Developed (km^2)	Mining (km^2)
Kootenay River Headwaters	5,390	5.15	0	0
Upper Kootenay River	6,595	61.23	53.36	0
Middle Kootenai	9,533	43.15	56.44	0
Elk	4,414	36.97	10.17	121.57
Lower Kootenai	9,693	151.29	36.06	0
Total[1]	**50,074**	**302.85**	**175.09**	**121.57**

[1]Total includes data for Fisher, Yaak, Moyie, Duncan, and Slocan tributaries. Those HUCs not shown in Table.

3.3 Human Activities and Associated Stressors

The Study Area has a variety of human activities within it that are typical for the region. Industrial activities tend to be focused on natural resource use and extraction. Forestry and mining have historically been and continue to be predominant industries in the Study Area. Recently, tourism, residential development, transportation, and recreational activities have increased. Current human activities with the largest footprint and the most extensive activity are forestry, metallurgical coal mining, hydroelectric dams, and linear development (roads, electrical transmission lines, and pipelines).

Logging and associated road building have occurred in many of the lower elevation valleys and on higher elevation ridges on both private and public lands. In the Canadian portion of the Study Area, roadless areas larger than 5,000 acres (2,023 ha) are uncommon except within national and provincial/state parks and wilderness areas.

Clear-cutting is the predominant method of forest harvesting, where all the economically useful trees are removed at the same time. This is particularly true on private forest lands. There is a relatively high proportion of private land holdings in the Elk Valley. Other forest industry activities include the Skookumchuk pulp mill, which discharges to the Kootenay River about 43 miles (70 km) upstream of the northern end of the Koocanusa reservoir.

In the U.S. portion of the Study Area, ownership and forest management is predominantly the United States Forest Service (specifically the Kootenai National Forest and Idaho Panhandle National Forest), which manages resources for multiple uses (clean water, healthy ecosystems, timber, livestock forage, minerals and energy, and recreation). Timber harvest in the U.S. portion is a blend of road-based pre-commercial thinning, fuels management, clear cutting, intermediate, and seed tree harvest. Significant roadless areas exist including the Cabinet Mountains Wilderness Area (94,272 acres, 38,150 hectares), with an additional 28% of the Kootenai National Forest still in roadless state. Management of the forest, especially the remaining roadless areas, must consider grizzly bears which are listed as endangered under the U.S. Endangered Species Act. There are only a handful of smaller timber mills remaining in the U.S. portion of the Study Area.

Environmental stressors associated with the forestry industry and associated roads include changes in the timing, volume and intensity of water flows off logged areas (with associated release and transport of sediments and other substances of concern to streams), nutrient loss, declines in terrestrial and

aquatic habitat suitability for certain species of wildlife, loss of habitat connectivity, and loss of biodiversity.

Metallurgical coal mining is the primary economic driver in Canada's East Kootenay portion of the Study Area and contributes significantly to provincial and national economies. The current gross mine footprint (including reclaimed area) is approximately 58 square miles (122 km^2). Environmental stressors associated with metallurgical coal mining include water pollutants such as selenium, nitrates, and sulphates; alterations in groundwater/surface water connections, water flows, and overall water balance due to mine dewatering, water diversions, and water withdrawals; and habitat alterations or destruction due to the creation of open pits, filling of creek valleys with waste rock, erosion, and deforestation.

Historic mining activities in the Study Area were extensive, due to occurrences of valuable metals such as gold, silver, copper, platinum, and lead. Larger historic mines include the Troy Mine (copper and silver) in the Lake Creek watershed south of Troy, MT and the WR Grace Vermiculite Mine near Libby, MT. Stressors associated with mineral extraction and processing include pollutants such as metals in the Troy Mine tailings, and asbestos in outdoor and indoor air and soils. Remediation of the Troy Mine tailings storage area was declared complete by the current owner of the property in 2022. The vermiculite site was placed on the USEPA Superfund National Priorities List in 2002 and subsequently has undergone extensive remediation to reduce risk to human health to acceptable levels.

The production of hydroelectricity is an important industry in the Study Area. The Libby Dam/Koocanusa Reservoir complex is by far the largest human-made structure in the watershed. The Brilliant, Cora Linn and Kootenay Canal dams (all located between Nelson and Castlegar, BC) generate electricity in the portion of the Study Area upstream of the Kootenay River's confluence with the Columbia River.

In addition to the power, flood control, and recreational benefits that dams provide to society, dams also have ecological impacts. Dams can fragment a watershed, obstructing fish migration. Dams and reservoirs can change natural water temperatures, water chemistry, river flow, and silt loads. All these changes can affect the ecology and the physical characteristics of the river. These changes may have negative effects on native plants and animals in and around the river. Reservoirs may cover important natural areas (especially low elevation floodplain habitat), agricultural land, or archeological sites. A reservoir and the operation of a dam may also result in the relocation of people, which occurred in the Study Area due to the construction of Libby Dam. The impacts of a dam and reservoir, its operations, and the use of the water can change the environment over a much larger area than the area a reservoir covers.

Linear developments of all kinds often follow river valleys in the Study Area, resulting in parallel roads, railroads, pipelines, and electrical transmission lines. River and creek crossings are numerous and not necessarily built with protection of aquatic habitat as a top priority. The Elk Valley Cumulative Effects Management Study found that the primary hazard to fish in the Elk River Basin was road density. Impacts of linear development include erosion (with subsequent sedimentation), blocking of fish migration, removal or degradation of riparian habitat, alteration of flow volume and pattern due to engineered streambank protections such as rip rap, and introduction of pollutants from road surfaces, road de-icing agents, and spills (road, rail and pipeline).

Recreation and urban and semi-urban development are increasing in the Study Area. Recreation includes hunting, fishing, hiking, biking, skiing, paddling, recreational driving (including off-highway vehicles),

wildlife viewing, photography, camping, horseback riding and packing. Recreation increases human presence, with accompanying disturbances such as overuse of established trails and proliferation of informal trails (with accompanying erosion), increased fishing pressure, improper disposal of human waste leading to water pollution, and introduction of invasive species. Increased urban and semi-urban development (partly in response to increased demand for accommodation for visitors and seasonal residents) is usually in valley bottoms, where impacts on riparian habitats and water quality are already evident.

Only a small percentage of the Study Area is agricultural land, much of it used for pasture and forage production. Agricultural development is confined primarily to valley bottoms. Though it utilizes a relatively small area, it has had a large impact on habitats of the mainstem river and tributary mouths because most of the activity occurs in the floodplain. The largest contiguous block of agricultural land is within the Purcell Trench, which extends roughly from Bonners Ferry, Idaho to the river's entry into Kootenay Lake. Agriculture in valley bottoms and floodplains can degrade or eliminate riparian and wetland habitat, introduce water pollutants such as nutrients, pesticides, and pathogens, alter water flows via irrigation withdrawals, and reduce biodiversity of aquatic, semi-aquatic, and terrestrial habitats.

All the human activities with associated stressors discussed above can interact with climate change processes and impacts in a cumulative manner. The effects of the various human activities on resources in the watershed indicated in the IJC Reference will be one of the principal goals of discovery in the Study and will be a focus of outputs from the Technical Working Groups (See Section 7).

4 Study Goals, Objectives, and Deliverables

As per the Elk-Kootenai/y Reference, Proposal, and Directive, the Commission established the IEKWSB to assist the Commission in conducting the work pursuant to the Reference. The objective of the IEKWSB is to assist the Commission in completing its study related duties under the Reference, as set out below. The IEKWSB and each of its members will be guided by principles of transparency, open communication, good faith, accountability, timeliness and respect, and will work inclusively, collaboratively, and with a positive spirit of cooperation.

To achieve this objective, the Reference and Directive outline the following duties for the IEKWSB. The IEKWSB will:

1. Conduct transparent and coordinated transboundary data and knowledge sharing; share, synthesize, and analyze data and information to support a common understanding of pollution within the Elk-Kootenai/y watershed and the impacts of that pollution on people and species; and report and recommend in a transparent and publicly available format on the following matters:
    a. The best available observational data, scientific research, and Indigenous knowledge regarding influences on, sources of, status of, and trends in pollution in water and associated effects on ecosystem health, which could include but is not limited to fish and aquatic life, wildlife, human health, and cultural uses in the Elk-Kootenai/y watershed;
    b. Data and research gaps, assumptions and uncertainties including any factors affecting data accessibility and comparability, such as data types and collection and reporting

methods relevant to improving understanding, measurement, and monitoring of the matters reviewed by the IEKWSB;

c. Recommendations for strengthening, coordinating, and prioritizing efforts on data sharing and transparency, science, monitoring and research, and inclusion of Indigenous knowledge, and other next steps and recommended actions on the matters reviewed by the IEKWSB;

d. A synthesis of the available data and scientific information and a resulting understanding of the water quality issues in the Elk-Kootenai/y watershed including contaminants of concern, areas, and water and ecological resources affected; and

e. Methods and procedures for ongoing monitoring and data analyses to further define the extent of pollution and identify trends in concentrations of contaminants in the watershed.

2. Where directly relevant and necessary to address 1(a) – 1(e) above, report and recommend on governance and decision-making, including the implementation of its recommendations.
3. Conduct Broad Engagement: Consistent with the March 8, 2024, Reference to the Commission, the IEKWSB is expected to draft and implement an engagement plan that includes engagement with federal, provincial, state, First Nations, Métis, and Tribal governments, industry, local communities, organisations, the public and others who live, work or have interests in the watershed. The overarching goal is to build relationships and seek, document and consider the resulting input and perspectives in assessments, conclusions and recommendations, as appropriate.
4. The SB will provide:
    a. a Phase 1 Plan of Study for conducting the study to the Commission including a detailed schedule and proposed budget for the studies and tasks to be undertaken, as well as an engagement plan.
    b. an Interim Report in September 2025, which will include, at a minimum, a summary of achievements, IEKWSB and working groups activities, independent peer review, communications/engagements with the public, Indigenous collaboration, study timeline and expenditures, looking forward, and issues requiring Commission advice and guidance.
    c. a Final Report in September 2026, which will consist of reporting and recommendations on the matters that were studied, and a summary of public engagement. It will also include a Phase 2 Plan of Study recommending potential future work, including public engagement and how and by whom this future work should be conducted and associated cost.

5 Organization of the Study and Governance Structure

On September 26, 2024, the Commission provided the IEKWSB with a detailed Directive which among other things, recommended a proposed governance structure for the study. Study governance will be the key to successful efforts on behalf of the Board (Figure 2). Active engagement from various interests in the watershed, including government entities that have responsibilities for water management in the basin, is necessary to ensure project success. The IEKWSB has adopted the proposed governance structure and has begun implementing it with the help of the Commission. The following sections, largely summarizing information in the Directive, describe the various components of the governance

structure. All members of the Study, **including** IEKWSB members, Study Management Team members, and Technical Working Group members are expected to serve the Commission in the best interest of the watershed and in their personal and professional capacities, and not as representatives of their respective countries, communities, agencies, organizations, or any other interests and affiliations.

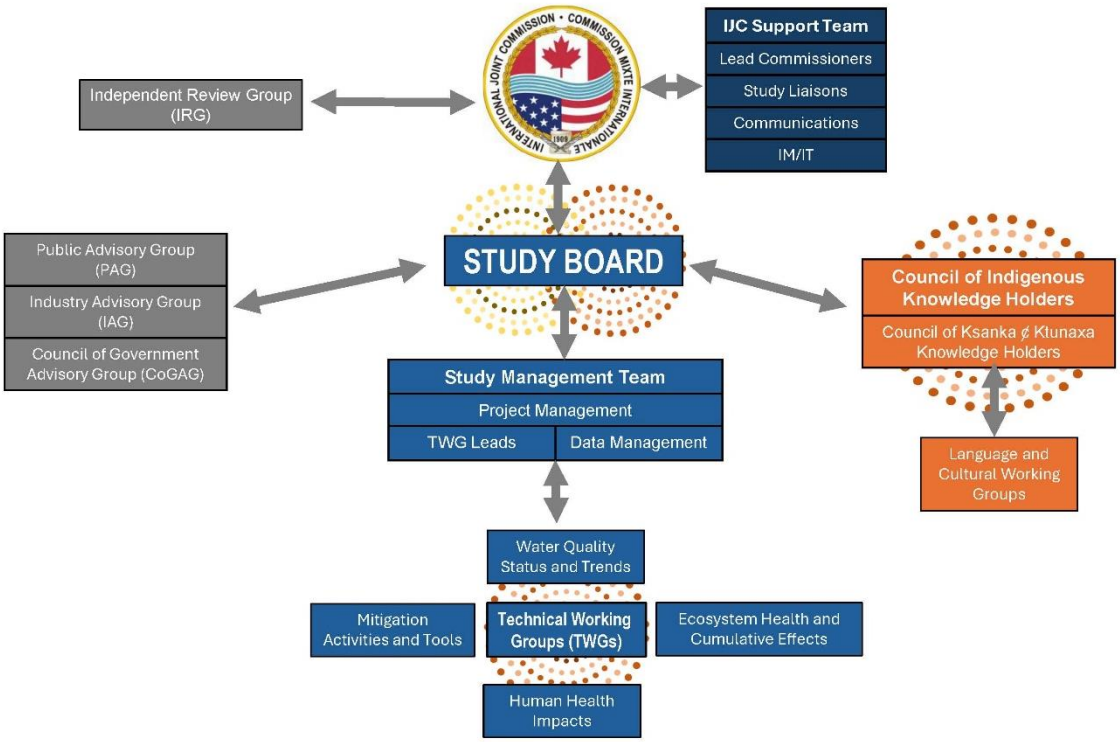

Figure 2. Governance Structure for the International Elk-Kootenai/y watershed Study. The circle illustrations have been modified from Ryder et al. (2020).

5.1 IEKWSB (Study Board)

The IEKWSB reports directly to the Commission but maintains objectivity and independence in conducting its work to report its findings and recommendations. The Commission provides oversight of the IEKWSB, assuring adherence to the Reference and this Directive. The IEKWSB is separate and independent from the other structure set out in the Reference, the Elk-Kootenai/y Governance Body (Governance Body).

The members of the IEKWSB are:

- Tom Bansak, University of Montana, United States Co-Chair,
- Oliver Brandes, University of Victoria, Canadian Co-Chair,
- Vi Birdstone, ʔaq̓amnik̓, Ktunaxa Nation member,
- Kelly Munkittrick, University of Calgary, Canadian member,
- Stella Swanson, Environmental Consultant, Canadian member,
- Clayton Matt, Tribal Resource Management, retired director, Confederated Salish and Kootenai Tribes member,
- Rich Di Giulio, Duke University, retired, United States member,

- Jill Frankforter, US Geological Survey, retired, United States member.

IEKWSB members will prioritize the work of the IEKWSB to ensure that it will function effectively and efficiently, make best efforts to attend all meetings, be familiar with the contents of this Directive and the Reference to the Commission, and review relevant information to ensure they are fully prepared to participate in meetings. If there is a critical gap in the composition of the IEKWSB, the IEKWSB may communicate this to the Commission.

5.2 IEKWSB Co-Chairs

The IEKWSB Co-chairs will convene and preside at all meetings of the IEKWSB and will jointly take a leadership role in planning and implementing the IEKWSB's mandate, including facilitating the IEKWSB's deliberations on its work, and securing consensus of the IEKWSB on its findings and recommendations. In the case that one of the IEKWSB Co-chairs cannot attend a meeting, that Co-chair will designate another IEKWSB member to assume the role for that specific meeting.

5.3 Council of Indigenous Knowledge Holders

As per the Directive, the IEKWSB will regularly consult with a Council of Indigenous Knowledge Holders (CoIKH) comprised of members from Indigenous Nations (which may include Tribal, First Nation and Métis) throughout the entire Study, to ensure that knowledge relevant to the Reference is requested, shared, synthesized, analyzed, and fully considered in the work of the IEKWSB. To help with this engagement of information, knowledge, and ideas, at least one of the IEKWSB members will sit on the CoIKH.

A Council of Ksanka ɛ̓ Ktunaxa Knowledge Holders (CoKKKH), has been appointed by the Commission's U.S. and Canadian Secretaries. Members were invited from each of the six Ktunaxa Nation governments. If needed, other Councils of Indigenous Knowledge Holders composed of members of other Tribal, First Nation, and Métis groups may also be formed as the study proceeds.

The circular structure in Figure 2 reflects the iterative and connected nature of knowledge, which is foundational to the Ksanka ɛ̓ Ktunaxa stewardship responsibility for ʔa·kxaʔmis q̓api qapsin (All Living Things). Ksanka ɛ̓ Ktunaxa ʔaqƚsmaknik̓ (people) have occupied Ktunaxa ʔamakʔis for more than 10,000 years. Through the significant and ongoing impacts to wuʔu ɛ̓ ʔamakʔis (water and lands) impacts to ʔa'kxaʔmis q̓api qapsin have occurred. As part of the covenant made with the Creator, Ksanka ɛ̓ Ktunaxa continue to be a voice for those who cannot speak for themselves – the four legged, the winged, the ones who crawl on the ground and swim in the waters – in upholding the responsibility given by the Creator to safeguard ʔa'kxaʔmis q̓api qapsin for future generations. This is part of the Ktunaxa role and responsibility throughout ʔamakʔis Ktunaxa, to steward wuʔu ɛ̓ ʔamakʔis ɛ̓ ʔa·kxaʔmis q̓api qapsin by continuing to honor relationships in the ways that have been taught generation upon generation.

5.4 Study Management Team

The Commission appointed a six-person Study Management Team (SMT) to assist the IEKWSB in delivering its mandate. The SMT will work under the direction of the Study Co-chairs, will participate in every IEKWSB meeting, and will remain fully aware of the IEKWSB's ongoing work. The SMT will maintain financial, travel, and other records as may be necessary to document the contributions of those involved in this work. The SMT will also oversee the Technical Working Groups (TWGs), provide logistics and lead the Study Board's communications and engagement processes, and be responsible for knowledge and

data management for the duration of the Study. SMT members are not IEKWSB members. The SMT is responsible for developing meeting agendas in collaboration with the Study Board Co-chairs, posting meeting minutes and other relevant information to the Commission's website and social media platforms, and tracking public discussion. The IJC will provide technical and other support to the SMT members in fulfilling their duties.

Two-person sub teams of the SMT will be assigned to the following tasks:

Project Management – Two SMT members, one from Canada and one from the United States (hereafter Project Managers), will be responsible for assisting the IEKWSB on delivering its mandate. The Project Managers will work under the joint direction of the co-chairs of the IEKWSB and will keep fully abreast of the work of the different groups, and function as liaisons between the IEKWSB and those groups. The SMT Project Managers will be responsible for the effective management of the IEKWSB's Phase 1 POS. The SMT Project Managers are responsible for communicating to the different groups the direction of the IEKWSB and assisting in general administrative support (e.g., meeting set-up; travel; administrative and contract matters; coordination of various teams and tasks; maintenance of digital files and repositories including SharePoint file systems; meeting minutes, documentation of study activities, distribution of study products; and providing briefings to the IEKWSB on tasks and topics identified by the Co-Chairs).

Technical Working Group Oversight – Two SMT members, one from Canada and one from the United States (hereafter TWG Liaisons/Leads) will serve as IEKWSB Liaisons with TWGs and the CoIKH, coordinating and supporting activities of Working Groups, helping TWGs develop workplans and ensuring workplans are completed withing agreed timelines and budgets. The TWG Liaisons/Leads will provide a direct line of communication between the IEKWSB and the TWGs and will provide technical guidance and support to the IEKWSB. Specific tasks include:

- Reporting to the Board and IJC regarding TWG activities and progress;
- Assisting the direction of TWG work based on the Board's request for information;
- Supporting the development of and reviewing all TWG documents;
- Attending all TWG meetings to provide overall study information and support meetings with meeting facilitation and note taking;
- Coordinating TWG assignments, communication, and facilitating inter-TWG communication;
- Providing general GIS support to all TWGs as needed.

Data Management – Two SMT members, one from Canada and one from the United States (hereafter Data Managers) will work with TWGs to ensure their data storage and acquisition needs are met, including planning and implementing long-term archiving of Study products and associated datasets. Specifically, the Data Managers will oversee data management, including the development of a data policy, Data Management Plan, and associated templates. This role includes ensuring that protocols for working with data obtained from outside the study are followed. They are also responsible for management and stewardship of Indigenous knowledge and data.

It is expected that the IEKWSB will store all digital data and files, including models, working files, etc. on the IJC SharePoint websites to manage, protect and preserve all Study data throughout the Study period.

5.5 Technical Working Groups

The IEKWSB will establish Technical Working Groups (TWGs) to assist the Board in carrying out the work under its Directive within the Kootenai/y watershed (i.e., sources of, status of, trends in, mitigation efforts and efficacy), and the impacts of that pollution on human and ecosystem health (i.e., human well-being, cultural uses, fish/aquatic life, wildlife)(Section 7). TWG members are appointed by the IEKWSB and reflect a diversity of membership to ensure that they can address all relevant dimensions of the work required under the Directive.

Through the SMT, the IEKWSB will ensure that the TWGs have clear direction as to the scope of their work, have ongoing opportunities to provide their advice to the IEKWSB, and that communication amongst TWGs is regular and consistent to ensure all recommendations and advice are informed by each other's expertise. The IEKWSB should also provide opportunities for all TWGs to hear the views of the other TWGs, where relevant, and provide opportunities for engagement with the Council of Indigenous Knowledge Holders.

6 Engagement

Throughout the Study, the interests and perspectives of the public, stakeholders, Indigenous Nations and their members, basin communities (rural and urban), and appropriate local, State/Provincial, Federal government agencies will be actively sought to contribute hydrological, ecological, socio-economic, and other relevant information and data to the Study to foster dialogue, communication, and participation at all levels, in both Canada and the United States.

The IJC and the IEKWSB are committed to providing all interested parties with convenient opportunities to be heard, as required in the Boundary Waters Treaty. The IJC emphasizes the importance of public outreach, consultation and participation, and promotes policies and programs that enable community input in the water management decision-making process to meet the needs of all stakeholders and rights holders. Such broad engagement includes the general public and must be driven by the concept that IEKWSB members, and members of associated committees and groups, participate and communicate objectively and independently of their native countries and organizations.

The IEKWSB is developing an Engagement Plan with IJC Communications staff, as required by the IJC's Directive to the IEKWSB. The Engagement Plan is a living document that will be regularly updated on the IEKWSB website. All public engagement is required to be reviewed by IJC Technical and Communications staff and approved by the IEKWSB. A key goal with broad engagement of diverse peoples and sectors is to ensure the management of the Elk-Kootenai/y watershed will meet the needs of all stakeholders and rights holders. The IEKWSB does not pre-suppose what will be needed to meet these needs and what other criteria are considered balanced and fair, but the IEKWSB does seek to develop an understanding of factors considered during evaluation of trade-offs.

6.1 Engagement Objectives

The IEKWSB will provide opportunities for direct in-person or virtual engagement with federal, provincial, state, Tribal and First Nation governments, industry, local communities, organizations, the public, and others who live, work or have interests in the watershed. In addition, the Study Board will provide opportunities for more general ongoing communication for those that wish to remain informed about the study.

6.1.1 Engagement Principles

Participation in the study will be driven by the following key objectives:

- Strive to ensure that the study process is open, inclusive and fair;
- Make the public aware of the study, its purpose, and process, including how decisions will be made;
- Provide opportunities to all interested parties to participate;
- Enhance public understanding of sources, trends, and effects of water pollution in the Elk-Kootenai/y watershed;
- Inform the study by identifying and building on local expertise, knowledge and information;
- Invite and consider the views of all interests of the principal issues;
- Identify and consider the public's, industry's, and government's priorities and preferences in the plan formulation;
- Broadly disseminate study findings as they become available; and
- Encourage the public as well as industry and government representatives to share study findings with others.

6.1.2 Engagement Methods and Approaches

The IEKWSB will invite comments about specific or general issues associated with the study as well as provide opportunities for all people with interest to express their views and provide data of their interests in respect of the study. The IEKWSB will use several important means for participation and outreach. These include public meetings, which will be held at least once in each country per year, either virtual, in person or both. In order to inform and provide context for the technical investigations associated with the study, the public will be consulted at the beginning of the Study to identify the public's views on the principal issues, questions of interest, study objectives, acquire any available knowledge in the form of historical data, anecdotal information, and identify existing or future plans, activities and initiatives that may relate to improving water quality in the watershed.

The IEKWSB may engage with the public in a variety of ways, including but not limited to listening sessions and open houses, community meetings, and webinars, as well as various methods of digital communication including social media, press releases, newsletters and videos posted to the IEKWSB website (www.ijc.org/elk).

Engagement will also enlist the assistance of Advisory Groups to provide an opportunity for specific interests and information to be heard by the IEKWSB throughout its deliberations.

6.2 Advisory Groups

Advisory Groups form a critical part of the study process. In addition to informing the study, the Advisory Groups will be a forum for interested parties to learn about the Study Board's activities and to offer their input, knowledge, insights, and perspectives.

The SMT, on behalf of the IEKWSB, will ensure that the Advisory Groups have clear direction as to the scope of their requested advice, have ongoing opportunities to provide their advice to the IEKWSB, and that communication amongst Advisory Group members is regular and consistent to ensure all recommendations and advice are informed by each other's expertise. The SMT will also provide an opportunity for all Advisory groups to hear the views of the other Advisory Groups, where relevant. The

IEKWSB will regularly apprise the Commission of communications with Advisory Groups, but at a minimum, the IEKWSB will document and present on its engagement and interactions with its Advisory Groups at the semi-annual meetings with Commissioners.

The IEKWSB, in coordination with Commission staff, may establish and appoint members to additional Advisory Groups as needed to carry out the work under the Directive. Members of Advisory Groups should have a presence or connection in the watershed, except in cases where a member may be appointed for their specialized knowledge or expertise, even if they do not have a presence or connection in the watershed. Advisory Groups are not required to make decisions or reach consensus in providing advice to the IEKWSB but must clearly present the areas of non-consensus to the IEKWSB for their consideration and determination. Co-Chairs, one from Canada and one from the United States, will direct each of the Advisory Groups. The IJC, with advice from the IEKWSB and SMT, established a Public Advisory Group and an Industry Advisory Group to advise and report to the IEKWSB.

6.2.1 Public Advisory Group

Members of the Public Advisory Group (PAG), including co-chairs, are appointed by the Commission's United States and Canadian Secretaries in consultation with the IEKWSB. The PAG is an important means of engaging the public in the study on an ongoing basis and will consist of seven members from each country representing key interests and geographic regions across the Elk-Kootenai/y watershed. Interests represented include recreation, conservation, and environmental protection. PAG members will have the opportunity to provide advice and input to the IEKWSB throughout the study's duration. Membership of the PAG may be expanded in the future if the Study Board identifies gaps in the representation of public entities.

The PAG members and the IEKWSB will seek to develop effective techniques to engage the public and stakeholders on a wide range of issues. More specifically, the PAG will be asked to:

- Assist the IEKWSB and the Communications Committee in the implementation of the Engagement Plan;
- Advise the IEKWSB on public consultation, involvement and information exchange;
- Serve as a conduit for public input and broad local knowledge and data input to the study process;
- Serve as a conduit for public dissemination of study outcomes by sharing approved information from the IEKWSB to their various networks throughout the community and continue the dialogue by bringing back views from their communities for consideration by the IEKWSB;
- Review and provide feedback on IEKWSB approaches, reports, products, findings and conclusions as requested; and
- Advise the IEKWSB on the responsiveness of the study process to public concerns.

6.2.2 Industry Advisory Group

Members of the Industry Advisory Group (IAG), including co-chairs, are appointed by the Commission's U.S. and Canadian Secretaries in consultation with the SB. The IAG will offer representatives from various industrial and commercial interests an opportunity to inform the study of their knowledge, insights, data, and perspectives on possible water management options being considered. The IAG will include six members from each country representing vested industries from the United States and Canada,

including mining, tourism, forestry, fisheries, commerce, and hydropower. It will provide advice, feedback and guidance to the IEKWSB.

6.2.3 Council of Governments Advisory Group

The Council of Governments Advisory Group (CoGAG) will serve as the primary means for the IEKWSB to engage governments that might be interested in or affected by the work of the IEKWSB. It will provide local, state/provincial, federal, and Indigenous governments an opportunity to hear directly from the IEKWSB about study progress and offer governments an opportunity to directly communicate with the IEKWSB. The CoGAG will include members from each country representing various locally and regionally relevant levels of government having relevant roles in the watershed. Members will include local and state/provincial elected officials and employees of local, state/provincial, and federal governments. Engagement will include, at a minimum, meetings to discuss the Study Board's penultimate draft Interim and Final Reports.

6.3 Communications

The IEKWSB established a Communications Committee. The Committee includes at least one Board member from each country, a member of the SMT from each country, IJC communications staff from both Canada and United States, contracted technical writers, and contracted facilitators and perhaps co-chairs of the Public and Industry Advisory Groups. The SMT members will co-chair the Communications Committee. The Committee will ensure the Board's communications to Advisory Groups and the IJC are consistent. The Committee will rely on help from IJC communications staff for contributions focused on strategic design, planning, and creating communications products; establishing target audiences; and scheduling and delivery of communications products. Additionally, IJC communications staff will help with media outreach and media training. Communications Committee members will work on behalf of the IEKWSB, not their home organizations.

7 Technical Working Groups

Technical Working Groups (TWGs) will be established to assist in carrying out the work under this Directive to "*support a common understanding of pollution within the Elk-Kootenai/y watershed. This includes the impacts of that pollution on people and other species.*" The TWGs will receive their scopes of work from the IEKWSB and will regularly provide findings and advice to the IEKWSB. The IEKWSB will ensure that there is regular and consistent communication among TWGs so there are opportunities for integration and iteration of findings. TWGs will be formed by appointing a small group of experts knowledgeable about a theme of concern in the Study Area, selected through an iterative process with the IJC and the IEKWSB.

Initially, the following TWGs will be established to accomplish the technical work needed to support the IEKWSB:

- Water Quality Status and Trends
- Impacts to Human Health and Well-Being
- Impacts to Ecosystems, Including Cumulative Effects
- Mitigation Efforts and Activities and Available Tools

TWG groups will be responsible for identifying cross-cutting issues relevant to many or all of these themes such as possible roles of climate and climate change.

Upon formation, each TWG will be asked to prepare a workplan describing the tasks required to fulfill their mission and associated funding, timelines, and products. Upon Board approval, each TWG will implement the workplan with the support and oversight of the SMT to ensure their success.

7.1 Principles for the TWGs

Principles for the TWGs that will contribute to sound decision-making include:

1. **Recognition of the transboundary nature of the watershed.**
2. **Recognition that the Directive is the first Reference to the IJC that the two federal governments have developed in partnership with First Nations and Indigenous groups:** it is essential to include Indigenous knowledge, culture and language because Ktunaxa knowledge contributes to our understanding of the accumulated watershed conditions, status and trends. Uncertainties related to Indigenous knowledge will be led by the CoIKH and contribute to the development of key questions.
3. **Development of key questions**: initial questions tasked to the TWGs in the POS are at a high level, and the TWGs will need to formulate and formalize more specific questions, assign boundaries to their tasks, and use formal uncertainty analysis and priority setting to focus their work to accomplish the goals of the Directive within the very tight time frame provided. The TWGs will need to have a clear understanding of a conceptual model to inform their work, recognizing that there will be overlap and fluidity between TWGs, and there will need to be clear communication between TWGs that will be assisted by the SMT.
4. **Assessment of data pertaining to the accumulated watershed condition or state:** the TWGs are tasked with assessing the existing accessible data and information and evaluating whether entities throughout the Study Area are measuring the right things in the right places at the right time in order to achieve the Objectives in the Directive.
5. **Transparency through accessible, comparable, and quality-assured data:** TWG activities should include evaluating the consistency of data and indicators, spatial and temporal boundaries, adequacy of baseline data, spatial or temporal trends (including error limits), the existence, and the adequacy and consistency of monitoring triggers or benchmarks.
6. **Relationships between environmental responses and system drivers (stressors)**: TWGs should include any existing studies or efforts to link observed impacts and specific stressors, causes, or mitigation efforts. Key uncertainties lead to the identification of critical data gaps or data insufficiencies.
7. **Identification of gaps and required enhancements to improve the characterization of the state of the watershed and to understand cumulative effects:** TWGs should include information required for the Study Board to make recommendations regarding governance and reduction or mitigation of the impacts of water pollution in the watershed based on assessment of existing data. Key uncertainties are those where information about important aspects influencing or driving impacts or their potential causes is imperfect or lacking. A good example would be the currently uncertain role of climate change as a current or future driver of the questions that Technical Working Groups will consider. Key uncertainties are the basis for prioritization and will guide the identification of recommendations for adjustments to the current monitoring (and

research) conducted in the Study Area. Recommendations for subsequent phases of the Study would continue with further design development, implementation of monitoring to address critical uncertainties and study questions, and evaluation of the new data collected during these phases. Any Phase 2 work recommended would require a new reference if it **were** to be conducted under the auspices of the IJC.

7.2 TWG Framework

The Directive tasks the Study Board to conduct transparent and coordinated data and knowledge sharing, make recommendations, report on progress, and seek opportunities for collaboration. The Study will result in the sharing, synthesis, and analysis of data and information to support a common understanding of pollution in the watershed, and the impacts of that pollution on people and species. Ultimately the Study Board will report and make recommendations on certain specified related matters.

The work of the TWGs will contribute to this by assembling, synthesizing, and assessing existing data, studies, summaries, risk assessments, and well-being studies; and identifying gaps that need to be filled. TWGs will be responsible for assembling and synthesizing data from a wide variety of sources, operated by different agencies or groups, and communicated and stored in a wide variety of ways. The TWGs will present the analyses and syntheses of data within their assigned and refined Objectives so that the IEKWSB can accomplish the goals of the Directive.4

To aid in organizing, determining, and investigating potential study questions of the TWGs, the IEKWSB has developed a framework based on adaptive monitoring to provide consistency in philosophy, key terminology, approach, and perspectives for the Study. The IEKWSB recognizes that this Study is focused on existing data, and that this Study's timeline does not provide enough time for new data collection and adaptive monitoring to be implemented within the Study Area. However, the IEKWSB directs the TWGs to assess existing data and knowledge, and the sufficiency and efficacy of ongoing monitoring efforts through the lens of the adaptive monitoring framework articulated below. Using this approach could help guide recommendations for effective future data gathering, monitoring activities, and mitigation efforts; although this document does not at this point commit the IEKSWB to any particular outcomes.

This framework has been developed utilizing *adaptive monitoring* principles. The purpose of *adaptive monitoring* is to provide the information required to make management decisions, including information that contributes to information on cause(s) or severity of effects. Adaptive monitoring adjusts the intensity, frequency, and focus of monitoring efforts in response to results in order to develop an understanding of causes of changes. It is designed to confirm predictions or identify when unexpected change is happening, and depends on predictions, or in the absence of predictions, on an assumption of no regional impact. Adaptive monitoring is best utilized in an iterative design aimed at understanding the effects of multiple stressors (including, but not limited to pollutants), analyzing and prioritizing uncertainties in that understanding, and progressing towards understanding the cause(s) of accumulated effects.

It is important to distinguish between approaches for adaptive management and adaptive monitoring. All figures describing *adaptive management* have a monitoring phase, and monitoring in the context of adaptive management cycles is an interpretation phase where data is collected on the consequence of a policy, regulatory, or management change. This type of monitoring is focused on understanding the effectiveness of mitigation, and for the purposes of this Study, will be called "*mitigation monitoring*". It

is focused on a specific mitigation action and specific endpoints that are known to have been impacted, and is trying to answer, "Did the management action work?" so that management can be adjusted if unsuccessful. Mitigation monitoring is best utilized when you think you understand the cause and indicators that would respond to an improved situation.

Adaptive monitoring and adaptive management are informed by the same data but serve different purposes (Figure 3).

There are different tiers of effort in adaptive monitoring, ranging from baseline and surveillance, through confirmation, to focused monitoring aimed at understanding the extent and magnitude of changes to the state of the watershed. "Investigation of cause" is usually research oriented. Once causes are established within an acceptable range of uncertainty, investigation of mitigation of those causes can proceed, which informs recommendations for management actions.

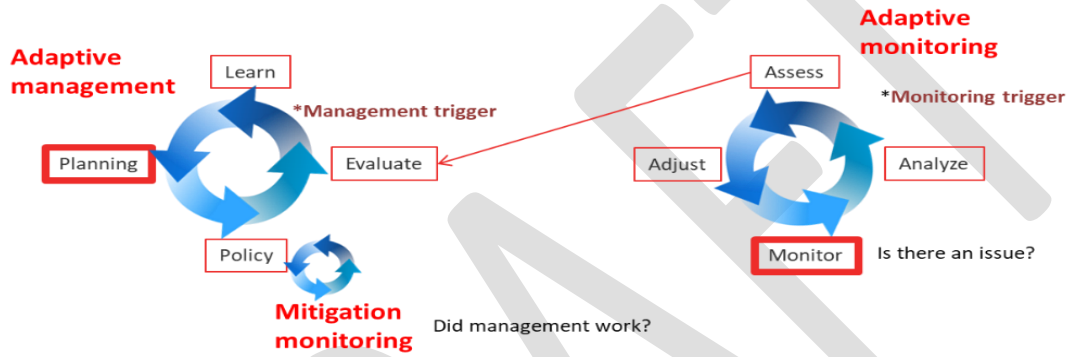

Figure 3. Adaptive monitoring and adaptive management are driven by the same data, but adaptive monitoring influences monitoring decisions, and adaptive management influences management decisions. Mitigation monitoring is a subset of monitoring types that is focused on evaluating the success of management interventions. (Adapted from Somers et al., 2018).

The monitoring data that will be assembled by the TWGs will come from a variety of types of monitoring programs designed for different purposes, including status and trends, baseline assessments, and mitigation monitoring, as well as performance monitoring and environmental effects monitoring. The intent of the framework is to facilitate clarity and communication within and across TWGs with respect to the compilation, consolidation, and assessment of results generated *within and across* the specific objectives listed in the Directive, as facilitated by the SMT. The framework will also facilitate the linkages between monitoring information, the development of recommendations, and decision-making. More details will be provided to TWG members at the onset of their assignments.

7.3 TWG Themes and Objectives

TWG themes were developed by the IEKWSB using a combination of emphasis from the Directive and collective knowledge held by the IEKWSB, SMT and IJC staff. TWG members will be supplied with a set of objectives and will need to complete those within a specified time frame and budget (see Section 11) and their work will be grounded in, and guided by, Indigenous Knowledge as determined by the CoIKH. While some of the TWG themes will have relatively well-developed points of commencement (e.g. Water Quality Status and Trends), others may require a more exploratory process to refine TWG objectives (e.g. Impacts to Ecosystems, Including Cumulative Effects).

7.3.1 Water Quality Status and Trends

Objective 1. Assemble and synthesize available hydrologic data, studies, reports and peer reviewed science for the Elk-Kootenai/y watershed as related to water quality and pollutants.
Objective 2. Identify and describe the occurrence of pollutants/constituents of concern in the waters of the Elk and Kootenai/y Rivers, Koocanusa Reservoir, and Kootenay Lake including sources and trends in concentrations and loads of these pollutants.
Objective 3. Identify relationships between hydrologic and water-quality data, including the identification of gaps in the data and research. Recommend procedures for screening credible data; statistically describing and reporting on the status of pollutants in the Study Area including associated uncertainty; coordinating collection and analysis of new data to fill gaps; and suggesting next steps (including methods and procedures for ongoing monitoring and data analysis).

7.3.2 Impacts to Human Health and Well-Being

Objective 1. Identify known or suspected human-health hazards from currently identified pollutants in the Study Area. Expand this analysis to include any additional pollutants/constituents of concern identified by the Water Quality Status and Trends TWG.
Objective 2. Assemble and review existing risk assessments and well-being studies and synthesize to report an assessment of risk using current information. Report on health and well-being including perceived and measurable threats to health based on culture.
Objective 3. As discussed in the POS preamble, identify high-priority data gaps in health-related information needed to fully meet objectives 1 and 2 based in uncertainty analyses and provide recommendations on approaches to gather additional information to fill these gaps.

7.3.3 Impacts to Ecosystems, Including Cumulative Effects

Objective 1. Develop a conceptual model focusing on identified pollutants but also identifying other key linkages that need further study. Identify terrestrial and aquatic features that are affected or potentially affected by identified water pollutants and other stressors in the Study Area.
Objective 2. Report on knowledge status of data for each component with respect to measured impacts attributable to water pollution.
Objective 3. As discussed in the POS preamble, identify high-priority data gaps in ecosystem impacts analyses (including cumulative effects) that would need to be filled to fully meet objectives 1 and 2 based on uncertainty analyses and recommend a set of prioritized studies to address gaps.

7.3.4 Mitigation Efforts and Activities and Available Tools

Objective 1. Identify, assemble and review data and information about implemented and planned mitigation and remediation efforts, including techniques (e.g., best management practices) and technologies related to water pollution from known sources (including forestry, industry, land development, mining, and other identified sources of stressors) in the Study Area.
Objective 2. Assess efficacy, effectiveness, and sustainability of past and ongoing water pollution mitigation efforts in the Study Area and determine if there are identified viable methods being used outside of the Study Area.
Objective 3. Compile and examine existing regulatory standards for water pollutants in the Study Area, including how they were developed. Identify if/where there are discrepancies between jurisdictions, if/where there are exceedances, and determine if there are opportunities to harmonize regulatory

frameworks across jurisdictions, while respecting the legal authorities and jurisdictions of each Government.

7.4 Interaction between the Council of Ksanka ɛ̓ Ktunaxa Knowledge Holders and the Technical Working Groups

Currently, the only Council of Indigenous Knowledge Holders formed to support the IEKWSB is the Council of Ksanka ɛ̓ Ktunaxa Knowledge Holders (CoKKKH). The CoKKKH share that Ktunaxa knowledge and language is all-encompassing, and therefore cross-cutting all of the TWG themes and objectives. ʔa·kxaw̓is q̓api qapsin, the Ktunaxa belief in *all living things,* expresses this interrelatedness and that culture, language and knowledge are ubiquitous. Given that Ktunaxa Knowledge and Language flows through all TWG themes, the recommendation from the CoKKKH is that there be interaction across the CoKKKH and each of the TWGs and the option for support from Ktunaxa staff as needed and available within the TWGs. In addition, the CoKKKH has suggested that although there is not likely capacity within the Ktunaxa Nation to sit on all TWGs, the CoKKKH will meet periodically with the IEKWSB, and SMT liaisons to the CoKKKH, to ensure consistent and iterative engagement throughout the development of the TWG membership and questions that each TWG will address. Through consistent and iterative engagement and discussion with the CoKKKH, the IEKWSB will ensure that Ktunaxa oversight, voice, and principal values are represented. In addition, both the IEKWSB and CoKKKH have requested that the option remain to develop a TWG specific to Ktunaxa Knowledge and Language should there be a need for this. If additional Councils of Indigenous Knowledge Holders are formed during the study, similar efforts will be made to incorporate their knowledge and perspectives into the work of the IEKWSB.

8 Data Management Approach

There are wide variety of data management initiatives that exist within the watershed, and for data from the watershed. Some examples include current data assembly, synthesis and interpretive work being conducted by groups such as the Flathead Biological Station, the Elk River Watershed Monitoring Collaborative, the Columbia Basin Water Hub, United States Geological Survey (USGS), US Army Corps of Engineers, etc. It will be critical that TWGs become familiar with, and evaluate fully, the work of these groups early in the process to help prevent "reinventing wheels" and leverage existing work.

The Data Management Plan defines the framework and protocols to ensure that all data collected, processed, generated, curated, archived, or utilized by the Study and the IEKWSB is secure, authoritative, well-documented, and accessible for long-term use. The DMP offers clear guidance for managing both existing data and all customized or unique datasets and data products created during the Study. Aligned with IJC data archiving practices, the DMP promotes data discoverability, quality, and usability for Study participants and the broader user community. The Study will prioritize the use of openly available data, except for data subject to confidentiality agreements with partner organizations. The DMP also respects the intellectual property rights of data originators, ensuring proper credit through authorship, citation, or acknowledgment. All data will adhere to Federal Geographic Data Committee/International Standards Organization (FGDC/ISO) Data Standards as stated in the IJC Data Management and Geospatial Policy. The DMP is a living document, updated as necessary to maintain relevance and effectiveness.

The IEKWSB holds primary responsibility for the development, maintenance, and oversight of the DMP, with direct support from a dedicated Data Management Team (DMT). The DMT manages and approves updates, ensuring alignment with Study objectives.

Data sensitive to the Ktunaxa Nation will be managed as directed by Ktunaxa knowledge holders in accordance with the IJC Data Management and Geospatial Policy.

Key elements of the DMP include protocols for internal data sharing during the Study and public data access after its completion. It establishes clear procedures for data and metadata preparation, defines the role of the data management system, and ensures the quality, discoverability, and availability of all project datasets and products. The DMP also supports short- and long-term data archiving, timely information sharing, and adherence to IJC Data Policy objectives. These measures ensure that data remains a valuable, accessible resource for researchers, decision-makers, and stakeholders in the Elk-Kootenai/y watershed.

9 Study Technical Reviews

Three general levels of study review will be used to assure technical quality of the activities:

- Internal review by the IEKWSB and CoIKH;
- Agency technical review of models and reports produced by federal or state/provincial agencies and provided to Technical Working Groups;
- Independent external reviews conducted by an Independent Review Group (IRG).

Reviews will be scalable to the content of each component of the study, deliberately included as part of the study process throughout the life cycle of the study (scoping, interim products, and final products), and concurrent with recommendations to include previous work in the study and completion of new study phases/products from each contributing agency/contractor and the IEKWSB.

9.1 Internal Review

The IEKWSB will conduct a preliminary review of existing/completed products and their associated documented peer and independent reviews. This review can be done by the IEKWSB or Technical Working Groups of the Board. These reviews will ensure consistency and coordination across all study components.

9.2 Agency Technical Review

Some of the products needed or produced by members of Technical Working Groups may require the review and approval of agencies before release to the IEKWSB. Agency technical and approval reviews are internal quality control processes performed within agencies by supervisors, senior staff, peers and others within agencies or in some cases (USGS) by outside peers. The Board recognizes the value of these processes and the independent reviews that characterize these processes in many agencies. Technical Working Groups should anticipate these reviews and account for them when establishing deadlines for delivery of products by agencies.

9.3 Independent Review Group (IRG)

The Independent Review Group (IRG), appointed by the IJC, will provide independent technical review and documentation of appropriate Study components and documents produced jointly during the Study process. The IRG, while appointed by the IJC, will operate independently outside the control of the IJC and the IEKWSB. Independent peer review is key to improving the quality of work in studies and the IRG will undertake interim reviews as well as the final reviews to facilitate early checks on methods and assumptions early, thus reducing the risk of late-stage issues for the study. An example of an interim review would involve the IRG in a review of the State of Knowledge documents prepared by each TWG.

An IRG review will be completed on all recommendation and implementation documents and specific study products identified as fundamental to making those recommendations. For other products, the IRC will receive documentation of existing reviews, with background documentation and recommendations for targeted reviews as may be needed. The IRG can subsequently request a review or other additional reviews of these products at their discretion.

10 Study Board Deliverables

As required by the Directive, the IEKWSB will provide the IJC with an interim report on its progress in September 2025 and a final report in September 2026 which will include a Phase 2 Plan of Study to follow up on this initial study.

11 Budget and Timelines

The budget for each group of tasks planned by the IEKWSB is shown in Table 2 and reflects the needs associated with

- The high levels of investment for Indigenous engagement and participation because the “Study to Address Transboundary Water Pollution in the Elk-Kootenai/y watershed” is the first Reference to the IJC that the two federal governments have developed in partnership with First Nations and Indigenous groups;
- An accelerated timeline, which requires increased levels of funding to enable the TWGs to function and achieve their objectives over a shorter time period, and
- The increased costs for data management coordination amongst the multiple and extensive data repositories currently in existence within the watershed.

The POS will likely be revised as the Study progresses, the scope of work is modified, stakeholders and public inputs are provided, funding levels are determined and results become available.

The IEKWSB anticipates several feedback loops related to engagement, input, and questions provided by the CoKKKH, Advisory Groups, the public, and other interested parties. The overall timeline for the TWG efforts may change as the questions, engagement-led discussions, and initial findings are assessed; and the required time to revisit or refine individual TWG outcomes are determined.

Table 2- Budget, activities required to meet the IJC Directive to the International Elk-Kootenai/y Watershed Study Board.

Activity or TWG	Requested Funding
General Engagement/Communications	$250,000
Indigenous Engagement – Council of Indigenous Knowledge Holders Support	$350,000
Study Management	$1,350,000
Data Management	$250,000
Travel	$300,000
Total Study Activities Request	**$2,500,000**
Water Quality Status and Trends TWG	$600,000
Ecosystem Health TWG	$600,000
Human Health TWG	$600,000
Mitigation TWG	$600,000
TWG Funding Request	**$2,400,000**
TOTAL STUDY REQUEST	**$4,900,000**

12 References

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