Alberta Fish and Game Association

<u>Creating the Environment for a Renewed Partnership</u>

Submission to the Chief Scientist of Alberta Environment and Parks and the Executive Director of Fish and Wildlife Stewardship Alberta Environment and Parks - March 28, 2022

<u>Special Note:</u> During the development of this submission, many documents, reports, and research were reviewed. Those felt most pertinent to this submission are identified in the appendix. We recognize this list of references falls short of a comprehensive literature review on the topics identified in this document. Regardless, on the topics identified, there is agreement and commonality. Fundamentally the goal of this submission is to create the environment for a renewed partnership with the angling community based on consensus agreement tied to key metrics, benchmarks, and foundational principles that guide fisheries management in Alberta. The reason this is necessary is that trust has been lost.

<u>Background</u>

The Alberta Fish and Game Association recognizes the importance of science in decision-making related to fisheries management. Science though does not come from a single discipline when there is the need to balance social, ecological, and economic values during creation of public policy. Fisheries managers on their own are only one spoke in a process that must include dialogue, input, communication, and engagement with multiple parties throughout the decision-making matrix. The failure to engage, be transparent, and obtain consensus at the earliest stage of process; then ongoing during policy development is the primary shortfall that needs to be addressed across government. Currently the process does not create the needed support for outcome-based actions that require multi-dimensional solutions.

Technocratic decision-making process driven by algorithmic models for support must have buy-in from many diverse stakeholders. Today, even consultations themselves are driven by a process model. However, does such a model equate to meaningful engagement? Support must be founded during the earliest stages of model development for there to be endorsement. AFGA recognizes the importance of models, but they are only a tool. When developed and applied appropriately they can lead to transparency, understanding, focused actions, and broad support.

Science is built on observation, research, and discovery. There are criteria that must be ingrained so that broad trust and support is developed related to the findings that extend beyond the scientific community. Comparability, consensus, standardization, application, and replicability are essential. Application of findings must not be   impacted by geopolitical boundaries or internal perspective. To this day, much of the rhetoric around wildlife and fisheries management has been to show that Alberta is unique, rather than building on common principles and consensus.

AFGA believes that the necessary consensus vision can be developed related to fisheries management in Alberta. To achieve this will require review of the elements and models that fisheries managers have developed that did not involve the necessary stakeholder input. *Alberta Fisheries Management Basics*

on page 20 of *Fish Conservation and Management Strategy* for Alberta clearly outlines the need to *"Consult with & Inform anglers & stakeholders"* at all points. Meaningful consultation implies inclusivity, listening, discussing, developing consensus including the mechanisms to accommodate differing viewpoints. There is the need to be adaptive as emerging science may require a change in direction.

While the process and priorities outlined in the *Fish Conservation and Management Strategy for Alberta* appear comprehensive, that is based on the premise that all aspects are applied. This is critical as sustainability will only be achieved through an ecosystem-based approach tied to cumulative effects mitigation. The failure to involve stakeholders and the angling community at the start of policy, program, or model development does not lead to the necessary buy-in and consensus which is required when addressing multifactorial issues such as sustainability.

This is not a new situation, and it was the impetus for the *Third Party Scientific Review of Alberta Environment and Parks' North Central Native Trout Recovery Program*. After accounting for the limited context of the report, the following excerpts speak to the heart of the problem that are applicable at a bureaucratic level:

• *"There is a lack of clarity and transparency as to how the CEMs were parameterized (i.e., to what extent was local knowledge and broad stakeholder input considered in the development of dose-response curves and the determination of watershed-specific doses?) and what specific criteria were used for the selection of watersheds."*

• *"A genuine commitment to transparency and openness on behalf of AEP operations and policy/planning is needed to restore public trust in Alberta Fisheries Management."*

Rebuilding trust initially should focus on a review of the Fisheries Sustainability Index (FSI), Fall Index Netting (FIN), and the Walleye and Northern Pike Recreational Fisheries Management Frameworks. There are other key parameters or concepts that also need to be addressed such as indirect morality and optimal sustainable yield.

AFGA finds itself at a crossroads. Fisheries managers in Alberta have a focus on individual fish species meeting modeled idealized population metrics. The approach has relied on sportfishing regulations and prior to 2012 commercial fishing regulations to achieve. Such direction is linear and does not create the environment that leads to the multiagency programs that are needed if sustainability is the actual goal.

Little has changed in contemporary fisheries management where the focus continues to be on monitoring individual fish species, followed by application of regulatory (harvest) controls. What has changed is that increasingly digital modelling tools are replacing the human dimension that formerly relied on observation, research, and critical thinking. What has resulted is algorithmic driven prescriptions based on model generation. Whether such prescriptions lead to better outcomes is very much an unknown as timelines to observe change are generational in the biological world. In addition, models often are designed to identify the "silver bullet," rather than recognizing that ecosystem dynamics are complex with many factors at play.

The movement to better understand ecosystem dynamics and variability with the development of cumulative effects models is laudable. Unfortunately, when driven by a single discipline or agency the application is muted. The result is the programs, projects, and regulatory oversight required, which is

multiagency in nature, struggles to be delivered as the necessary broad social, economic, and environmental support is not obtained.

Perhaps no where is this dilemma more acute than related to fisheries management. We can continue to go down the same rabbit hole which has resulted in quasi-default regulations for many fish species of catch and release only in Alberta (ultimately permanent closure), or we can choose a different path. The path involves partnership, buy-in, and collective vision. It is also tied to recognizing limitations, natural variability, compensatory effects, realistic timelines, and a multipronged approach.

While allocation will remain a primary tool, it must be tied to natural variability and ecosystem dynamics that shift over time. Much has changed over the last four decades. The risks to fish populations from overharvest have been mitigated through implementation of complex sportfishing regulations but this comes with limitations, costs, confusion, and unknown outcomes at a landscape level.

The Alberta Fish and Game Association has been advocating for simplified, common conservation based sportfishing regulations (CCRB) in Alberta for most waterbodies for over a decade. Only a limited number of waterbodies would be designated for intensive management involving the setting of sportfishing or special fisheries objective. This subset of waterbodies is envisioned to include where most of the sportfishing in the province occurs, or waterbodies with fish populations displaying unique dynamics or characteristics. Managers would be expected to use all the tools at their disposal, redirect resources internally (manpower and capital) to achieve the objectives set in partnership, collaboration and consultation with the community and stakeholders. By focusing on these select waterbodies, the required consultations, objective setting, monitoring, and management actions can be achieved.

Further this should create the environment for reallocation of resources, including manpower to ecosystem focused (habitat) management systems and landscape level actions such as education. This would replace the current paradigm but involves moving out of the traditional siloes that exist at department levels throughout government.

AEP current direction can best be defined as primarily focusing on a standardized algorithmic sportfishing regulatory decision-making process. Rather, there must be a shift to cumulative effects management (CEM) that extends beyond the angler to deal with the long-term sustainability of the resources which is tied to habitat. The mind set expounded by fisheries managers is they do not have the tools or controls to tackle the problem on their own. With the existing focus of the department, we acknowledge this is true but highlights the pressure to maintain status quo internally. What is required is change across government. Breaking down siloes will only start with frank and transparent inter and intra ministerial communication that clearly outline the problem and the degree each department or ministry will compromise and cooperate. At the same time, the creation of the needed partnership with the angling community and stakeholders must happen which is tied to having a real input into the decision-making process.

There are additional ways where capacity can be created through transferring responsibility and control. A prime example is fisheries managers belief they must be hands on in the management of stocked put and take trout fisheries. This responsibility could easily be shifted to another agency as has been done in other jurisdictions.

Even with Alberta's limited waterbodies the capacity to monitor fisheries at the scale necessary does not exist, nor will it be possible in the future. While AEP believes it can mange all fisheries at a waterbody level scale, this is simply not possible or realistic. Achieving and maintaining idealized modeled population metrics in the complex natural environment is neither obtainable, practical, or necessary to meet conservation or sustainable fisheries objectives.

While the *Alberta Guide to Sportfishing Regulations* has changed in format, this primarily has improved readability but has not addressed the variability and complexity in the regulations. The various species-specific recreational fisheries management frameworks, even with limited regulatory options, when applied at a waterbody specific level lead to complexity which does not pass the threshold of "simple."

AFGA recognizes that its proposal to adopt common conservation based standardized regulations will not lead to achieving maximum sustainable yield. Such fisheries will function within the natural variability and ecosystem dynamics that exist. Collapse however will be unlikely due to sportfishing unless there are other issues at play such as illegal harvest or habitat constraints.

AFGA has presented on the needed changes including to the Alberta Fisheries Management Round Table (AFMRT) before it was disbanded. Comprehensive documents have been provided to the department as well other stakeholders in 2018 and 2020. Even the basic courtesy of acknowledging the documents and presentations by the GoA would have been anticipated but this has not occurred. This input appears to have become lost or ignored. Fundamentally this is a failure of understanding what is implied through meaningful consultations which is a tenant of the *Fish Management and Conservation Strategy for Alberta.*

AFGA also recognizes that fisheries managers have largely come from an educational and workplace background that creates a philosophical perspective where the focus is on the biology. Unfortunately, the necessary social and economic parameter that must weighted while managing natural resources are lost in such an equation. This is compounded when risk management drives the direction rather than meeting conservation targets. The wide application of algorithmic models into the decision-making framework has led to greater complexity and deepening divide between the angling community and fisheries managers. The movement to technocratic decision making that results in the lack of consensus, buy-in by stakeholders, or multifaceted action plans must be addressed.

We are at a point today where must go back and rebuild trust particularly as tied to fisheries management in Alberta. Fisheries managers should not feel threatened by such a process as the endpoint will be a renewed partnership.

Starting point in rebuilding trust

Rebuilding trust initially should focus on a review of the *Fisheries Sustainability Index (FSI), Fall Index Netting (FIN)*, and the *Walleye and Northern Pike Recreational Fisheries Management Frameworks*. AFGA recognizes that the current benchmarks, criteria, and regulatory actions that have been adopted maybe appropriate in the Alberta setting. At the same time, the failure to address concerns, acknowledge input, or engage in meaningful consultations is the root of the lack of acceptance. This is further compounded when Alberta continues to appear to want to reinvent the wheel or relies on using limited subset of peer reviewed research for validation.

AFGA has developed its documents using consensus-based research, professional input, observations as a user group, with open, shared, transparent communications. The angling community needs to be involved in benchmark setting. The "trust me" mantra will not lead to support. Agreement on benchmarks creates an educational opportunity where the broader stakeholder groups can be involved, not just the elite.

This request if built on the following:

1. Redefining Fisheries Management in Alberta "Call for Change from the Alberta Fish and Game Association" February 2018
2. AFGA 2020 AGM: Road to Change – Fisheries Management in Alberta – Overview, Direction, and Survey
3. Alberta Fish and Game Association – Current Position Statements June 1, 2020
4. A Third Party Scientific Review of Alberta Environment and Park's North Central Native Trout Recovery Program
5. Fish Conservation and Management Strategy for Alberta

Key issues and requests

Fish Sustainability Index (FSI)

The Fish Sustainability Index (FSI) was an Alberta developed model initially touted as an educational tool to portray risk. From the beginning AFGA questioned the need to build an Alberta stand-alone tool. Existing platforms were available, used in multiple jurisdictions, can be applied across wide range of flora and fauna, use standardized risk assessment criteria, and allow for cross jurisdictional comparison. It was not until several years into the FSI development process that there was an acknowledgement by Alberta Environment and Parks that other models such as the "NatureServe" platform were available. Nature Serve has continued to evolve and expand https://www.natureserve.org/. Most recently it developed "A Species Habitat Model Standard for the NatureServe Network."

There are root issues that the Alberta fish and Game Association believes need to be addressed:

• Lack of interjurisdictional comparability
• Limited applicability to ecosystem dynamics involving multiple species (fish, wildlife, invertebrates, flora)
• Manpower, time, and costs to develop and maintain for each species
• Broader application beyond original intent
• Subjectivity
• Failure to involve or input stakeholder observation
• Failure to engage with stakeholders on benchmark determination

The benchmarks and criteria that impart an FSI rank for species need review. This is critical as the application beyond the educational platform that was initially identified, to that of an algorithmic decision-making tool embedded within various policy frameworks has now been incorporated. The impacts are far ranging including sportfishing regulations and species at risk assessments. Agreement that involves direct participation of stakeholders on the appropriate risk assessment benchmarks is required for each fish species within the FSI platform.

Monitoring

Using standardized monitoring protocols for fish populations assessments provides data that is useful to understand changes in population dynamics such as relative abundance, growth, sexual maturity, and competition. Different species and ecosystem types will require different monitoring tools. The analysis of the data is driven using statistical parameter such as standard deviation, probability, and data consistency. Monitoring fish species within their natural habitats is subject to variability and uncertainty. Trends over time can be studied but determining whether should be a concern is a complex question.

The assignment of FSI rank based on Fall Index Netting (FIN) monitoring is an example of benchmark setting. The FIN monitoring tool essentially remains the standardized Fall Walleye Index Netting (FWIN) protocol developed in Ontario. The primary difference is in the use of the FIN data in Alberta which has been expanded to assess risk related to Northern Pike, Lake Whitefish, in addition to Walleye populations in lakes and reservoirs in Alberta.

Key questions - General

How has pre-FIN monitoring data and research been incorporated into the longitudinal population timeline trends which is the foundation to understanding fish population dynamics which are generational?

AFGA recognizes that a great deal of information can be obtained through the FIN assessment protocol. Relative abundance of Walleye populations on an individual lake basis was the tenant for adopting this standardized monitoring protocol. There are however many other data sets obtained with the sampling protocol. To what extent are the other information metrics incorporated and compiled to understand ecosystem dynamics in Alberta? How comparative is the information across waterbodies based on based on a diversity of parameters including geography, climate, and ecosystem type across Alberta?

Key request – Walleye

Walleye adult abundance FSI scores (risk) are based on FIN monitoring. This risk assessment metric was developed based on comparison to composite information from ten lightly exploited actively managed reference lakes used to establish the very low risk category (FSI 5). The other risk categories were then based on IUCN methodology used to establish sustainability category thresholds (MacPherson et al. 2014).

AEP has never disclosed the list of the 10 lightly exploited managed reference lakes for adult walleye abundance along with the related monitoring and research for these waterbodies. Nor have they disclosed list of the five representative Alberta lakes supporting long-term sustainable harvest of Walleye that are referenced in both FIN reports and frameworks. The following information and research would be expected to be available for these waterbodies. We are requesting that this information be shared and provided. AFGA has made this request in the past with no response from the department.

List of the ten lightly exploited managed reference lakes for adult Walleye abundance and the related reference material for each:

- FIN surveys
- Mark recapture studies
- Creel surveys
- Ecosystem type
- Ecosystem diversity
- Growing days
- Lake classification (trophic level, alkalinity, temperature, depth)
- Bathymetric profile

List of the five representative Alberta lakes supporting long-term sustainable harvest of Walleye and the related reference material for each:

- FIN surveys
- Mark recapture studies
- Creel surveys
- Ecosystem type
- Ecosystem diversity
- Growing days
- Lake classification (trophic level, alkalinity, temperature, depth)
- Bathymetric profile

 Key request – Northern Pike

No other jurisdiction has standardized the FWIN protocol to assess the relative abundance of Northern Pike populations. Instead, other monitoring protocols are used in these jurisdictions. General information on all fish species caught during FWIN sampling is recorded. Alberta has developed Northern Pike adult abundance FSI scores (risk) based on FIN monitoring. This risk assessment metric was developed based on comparison to composite information from five lightly exploited actively managed reference lakes used to establish the very low risk category (FSI 5). The other risk categories were then based on IUCN methodology used to establish sustainability category thresholds (MacPherson et al. 2014).

AEP has never disclosed the list of the five lightly exploited managed reference lakes for adult northern pike along with the related monitoring and research for these waterbodies. Nor has the calibration methodology of FIN to assess Northern Pike been disclosed. Further they have not disclosed list of the six representative Alberta lakes supporting long-term sustainable harvest of Northern Pike that are referenced in both FIN reports and frameworks The following information and research would be expected to be available for these reference waterbodies as it is tied to calibration and FSI scores. We are requesting that this information be shared and provided. AFGA has made this request in the past with no response from the department.

List of the five lightly exploited managed reference lakes for adult Northern Pike abundance and the related reference material for each:

- FIN surveys
- Mark recapture studies
- Creel surveys
- Ecosystem type
- Ecosystem diversity
- Growing days
- Lake classification (trophic level, alkalinity, temperature, depth)
- Bathymetric profile

List of the six representative Alberta lakes supporting long-term sustainable harvest of Northern Pike and the related reference material for each:

- FIN surveys
- Mark recapture studies
- Creel surveys
- Ecosystem type
- Ecosystem diversity
- Growing days
- Lake classification (trophic level, alkalinity, temperature, depth)
- Bathymetric profile

Optimal Sustainable Yield

The Fish Conservation and Management Strategy for Alberta states that optimal sustainable yield (OSY) calculations are the basis for determining harvest. The principles behind OSY are conceptual which leads to calculations that become subjective, perspective driven, and risk adverse. Having sufficient data to quantify OSY is unlikely at a landscape level. Even at a waterbody specific level there will be data gaps and unaccounted natural variability.

Review of the literature shows confusion even within the academic and management community. OSY is often used interchangeably with maximum sustained yield (MSY). MSY continues to be used by most jurisdictions to determine harvest potential. There is long standing research as well management experience to support the validity of the calculations.

Fisheries management has moved beyond a focus of maximizing harvest. Biodiversity and ecosystem objectives complimented with establishing sportfishing objectives now play an increasing role. AFGA has long been an advocate for this direction. This however does not imply that consumptive harvest of fish should cease. Catch and release angling itself is under scrutiny, despite being a critical management tool for sustainable harvest or recovery of fish species.

Objective setting will need to include calculations to determine mortality whether from harvest, catch and release angling, or illegal activity. Mortality whether natural or as the result of human activity will need to be accounted in the determination of the fisheries objective whether at a landscape or

waterbody level. Objective setting is a process that must involve meaningful engagement where the trade-offs, options, and impacts are openly discussed, transparently disclosed, and understood.

The methodology of "checkbox" engagement does not meet expected standards of engagement. What is required is stakeholder driven consensus building process where fisheries manager becomes the facilitator. This is followed by an implementation phase where multiple actions will be required which in most cases involve many players and moving parts.

AEP has identified objective setting as a stakeholder-based process in the *Fish Conservation and Management Strategy for Alberta*. Setting objectives however relies on the information provided by the department. For stakeholders to have trust that the information is balanced is imperative. Potential sustainable harvest calculations are thus based on ensuring that the benchmarks within the strategies, FSI, and frameworks are not multiplicative for risk determination.

AFGA would suggest that OSY continues to be an academic exercise and concept that leads to confusion. AFGA has continued to advocate for common conservation based sportfishing regulations (CCBR) that would apply at a landscape level. Meeting MSY or hypothetical OSY harvest targets would not be the goal of these regulations. The impact of angling pressure and harvest when it can only be extrapolated based on landscape level understanding to individual waterbodies is subjective. CCBR regulations by their design are intended to lessen the impact of this unknown. Thus, the objective remains conservation leading to long term recovery or sustainability while still maintaining angling opportunity with limited harvest of some species.

This would leave a small subset of waterbodies, where depending on the objective, the harvest potential would require detailed assessment supported by the necessary research and data. These waterbodies would be intensively managed with waterbody specific regulations and other actions. Calculating harvest potential is one component in the allocation equation. Empirically knowing angling pressure and catch rates is necessary to develop regulations tied to the management objective for such waterbodies. Creel census, boat counts, citizen science, and surveys are among the tools that will need to be used. The application of all tools allows for sustainability objectives to be achieved in these important waterbodies which have high angling pressure.

AFGA understands that within potential harvest calculations that indirect mortality, illegal harvest (poaching), and research morbidity needs to be accounted. These metrics must be developed through a consensus-based approach supported by data and research.

Key request

AEP has identified that it uses OSY to determine harvest. Whether this is an embedded risk metric that is subject to ambiguity and discretion is a concern. Clarity as to the research, parameters, values, and application is required by the stakeholders. Sportfishing regulatory options presented or imposed by AEP are tied directly to this determination.

Catchability

Standardization of monitoring protocol is designed to allow for comparability and greater confidence in trend analysis. Natural systems by there nature create challenges for monitoring due to variability. The basis of Bayesian theory is that greater comparability over time is possible due to multiple data sets. The issue of catchability is integral to monitoring protocols as there are major implications in the data analysis and comparisons. There are multiple factors that need to be considered including technology, gear, and variables that exist in natural environments. Ultimately catchability is tied to species abundance, composition, and density. These estimates feed directly into models that are used to assess risk or determine regulatory options.

 AFGA continues to be supportive of standardized monitoring protocols provided their use and application is appropriate. It is unlikely that two data points or limited studies are sufficient to conclude a trend. Recognizing this limitation, unless an observed event occurs such as winterkill, as such multiple points are required to conclude trends. Natural variability is to be expected. The challenge is to ensure that exploitation does not exceed the ability of the ecosystem to compensate to maintain sustainability. Therefore, AFGA is a proponent of having in place CCBR.

There are multiple variables that impact standardized monitoring protocols including technology change, gear issues, and natural variability such as climate or waterbody type. During protocol development such variables are considered with the attempt to minimize their impact on the resulting data to allow for comparability. Alberta has opted for single monitoring protocols. Other jurisdictions have recognized that such an approach is insufficient to understand ecosystem dynamics. While it may be simpler to use a single protocol, this is based on internal priorities, manpower and capacity constraints rather than adhering to best practices. The *Fish Conservation and Management Strategy for Alberta* outlines monitoring protocols used by the province, but most are seldom used. This is also a short list of practices compared to other jurisdictions. Citizen science is not even acknowledged.

The key parameter catchability appears to be another embedded risk metric. Alberta fisheries biologists have indicated that fish species in Alberta are more susceptible to be caught during monitoring than elsewhere in North America (higher catchability). For FIN monitoring of Walleye in Alberta it appears a catchability coefficient ranging from 1.6 ha/(100m²net*night) to 2.2 ha/(100m²net*night) is used to calculate density or abundance. Compared to Ontario which uses the same monitoring protocol on waterbodies in similar climatic zones to those in Alberta, the coefficient has been shown to average 1.04 ha/(100m²net*night). Lake Oneida in New York has had extensive research which has shown catchability to average around 0.25 ha/(100m²net*night).

The implication is Walleye populations in Alberta need to show a FIN catch rate roughly twice that of Ontario to represent the same population density. This then equates to an FSI threshold within the species management framework. Potential harvest calculations rely on knowing density and abundance of age classes.

As other jurisdictions use the same monitoring protocol, waterbody and composite data is available. Ontario has shown that its FWIN catch rates for Walleye range from 0 to 33.4 with the mean being 10.7 based on 167 waterbodies in northwestern Ontario. Northern Pike FWIN catch rates ranged from 0 to 10.6 with the mean being 2.2 based on 412 waterbodies across the province. These values represent the

overall population, not just adults. If these values were applied (higher than just the adult abundance) to the Alberta frameworks, the results would suggest that most Walleye populations are at high to very high risk of sustainability in Ontario. Similarly for Northern Pike, all the waterbodies would be at high to very high risk.

Trying to understand such dichotomy based on FIN monitoring assessments in Alberta does bring about fundamental questions. AFGA accepts that higher angling pressure exists in Alberta but this is offset to a degree by far more restrictive regulations which should be accounted for in risk assessments. As the waterbodies where FWIN assessments in Ontario generally have similar growing days and climate to Alberta, except those in the Southeast Ontario, the results appear comparative as the same monitoring protocol is used in both jurisdictions. The only variable that appears to be at play thus is catchability.

Catchability, when lethal monitoring protocols are used, needs to be incorporated as a component of harvest calculations like indirect mortality and poaching. FIN reports for example show up to 2.6% of the Walleye in a population are removed. When this is expressed as a percentage of the Walleye harvest available it is significant, particularly under a precautionary or OSY formula. If higher catchability is a reality, then movement to half or even quarter FINS must become the rule to reduce this high monitoring mortality.

Key request

AFGA has consistently asked for the research from Alberta that demonstrates this higher catchability for Walleye from across the province under the FIN protocol. In addition, as Northern Pike calibrations from FIN have been adopted in Alberta, similar research for this species should be available. Despite requesting this research in the past, it has not been provided. The reluctance of AEP to provide research is troubling.

We are aware of a study from Amisk Lake where this catchability calibration was undertaken as it is referenced in research the was reviewed. However, we could not locate it during our literature review. Research from other jurisdictions show that variability can exist that appear related to waterbody-specific differences or seasonal variations. Considering that Alberta Walleye and Northern Pike populations exist in diverse ecosystems across wide geographic and climatic range it is critical that embedded risk metrics be identified and understood.

The catchability coefficients currently used in Alberta have not been disclosed. AFGA is requesting that they been outlined. In addition, the research validating these coefficients be provided.

Regulatory options

Alberta has maintained a narrative that highly restrictive sportfishing regulations that rely on minimum size limits or catch and release angling are the best way to ensure sustainability or recovery of fish populations. The argument has been that it is necessary to allow fish to spawn several times before they are vulnerable to harvest. In addition, overall fecundity is enhanced as total population egg volumes are higher by protecting fish during their first few years of maturity. There is a growing body of research that suggest that such a direction has long term consequences including growth truncation, harvest primarily directed to females, behavioral changes, and genetic concerns.

The movement to narrow harvest slots is being embraced in North America for both recovery and sustainability objectives. Alberta has recently adopted this approach but reluctantly. There appears to be an effort however to discredit this regulatory option internally. Regulatory change at a population level take time to understand how the ecosystem adjusts. The issues related to minimum size limits only became apparent over time which shows why waterbodies need to have the same regulations in place for extended periods to understand the effects.

AFGA has proposed the CCBR regulations that are either catch and release or narrow harvest slots for critical species with minimal retention limits need to be adopted for most waterbodies. Waterbody specific regulations would be applied to a limited number of waterbodies where intensive management is possible. The regulatory options available beyond retention limits would be expanded to include harvest slots, innovative tag harvest options, catch and release, and experimental regulations tied to angling pressure and fisheries management objectives. In addition, other management tools would be applied. The reality is that most of the angling pressure in the province for self reproducing populations of native and naturalized fish species occurs at a limited number of waterbodies. This is where resources, intensive management, monitoring, and site-specific regulations should be applied.

AFGA is concerned that management direction is driven based on perceptions of the past that does adequately consider emerging science or the societal changes in attitude, acceptance and compliance within todays angling community.

Key request

Compliance with size limits by anglers appears to be the primary concern. AFGA is requesting the research and enforcement statistics that quantifies the severity and extent of non-compliance issue with size limits. The premise for framework regulatory options is they lead to idealized sustainable population dynamics. As such AFGA is requesting the research and modelling that concludes that minimum size limits provide for the obtainment of optimal ecosystem dynamics while maintaining angling opportunity including harvest be identified.

<u>Indirect mortality</u>

AFGA recognizes the need to account for indirect mortality from sportfishing that is the result of both voluntary or regulatory induced adoption of catch and release angling. As was noted in the OSY section there needs to be agreement built through a consensus-based exercise supported by science as to what the appropriate metric (value) should be when implemented into models, frameworks, and research.

More importantly though is the need to reduce this impact. This is for both biological and ethical reasons. The push for common conservation-based regulations (CCBR) recognizes that the impacts from sportfishing will still exist even though there is limited or no harvest. Indirect mortality of released fish from angling will continue and may account for most of the mortality due to angling in some waterbodies. This indirect mortality issue is one component that can only be addressed through a cumulative effects management (CEM) approach. Dealing with the issue requires multidimensional undertakings. While a totally volunteer approach would hypothetically be ideal, AFGA recognizes that timelines to deal with the issue in a real way are short, particularly when managing species at risk.

To date AEP has approached the issue using the silver bullet principle. AEP has largely relied on a regulatory approach focused on bait bans. Research shows that the use of bait is a significant factor in indirect mortality largely due to the deep hooking tendency. However, this single action is insufficient to deal with the issue with the high angling pressure on many waterbodies in Alberta. A recent educational video from Micheal Short on *Arctic Grayling Survey Day on Dismal Creek, Heartbeat of the Upper Pembina River* shows fish under stress even when released by professional biologists. Such immediate post release issues may be indications of higher likelihood of delayed post release mortality. Currently discussion related to indirect mortality appear focused on closures and limited entry fisheries to address indirect mortality related to catch and release angling. Such restrictions come with them a loss of opportunity.

AFGA would suggest that there are a series of incremental actions that must occur concurrently for greater post release survivability. This is the classic case of many small actions equating into an overall gain. Trying to identify a single magic bullet, as many post release mortality studies have attempted to quantify, has led to confusion. Practically the issue is simple, fish to be quickly released while keeping them wet and avoiding further trauma. AEP continues to maintain research suggest gear restrictions such as no barb regulations do little to improve post release mortality rates. Reality is that the when the issue is one that is defined by seconds there are multiple interrelated and connected stressors that are at play. To deal with this requires a series of actions that are complimentary and additive. While some actions will lend themselves to a regulatory or enforcement approach, others are tied to ethics, education, and public awareness. Phased approaches or single actions will fail when the issue is defined by seconds.

To address this indirect mortality issue, AFGA has called on the Government of Alberta to immediately engage in collaborative inclusive consultations with the angling community to address the indirect mortality impact of released fish related to sportfishing sustainability objectives. There is a need for a comprehensive vision that addresses low flows, water temperature, trauma, air exposure, and handling time associated with catch and release angling.

AFGA envisions an approach that includes regulations, enforcement, education, public awareness, collaboration, and partnership. While the immediate priority likely is best tied to the native and naturalized coldwater species, there are overarching and long-term application to coolwater species as well. Social acceptance would be greatest however if the coldwater species provides the starting point. In addition, there is an engaged segment of the angling community that have been asking for such changes.

The difficulty that AFGA finds itself in is that AEP does not appear to support or is willing to dedicate manpower and resources towards developing a comprehensive program. This appears to be a classic case of staff resisting a move away from their traditional role of monitoring and regulation development. As no feedback to previous submissions from AFGA on this issue has been provided, it really leads to the question as to whether the department values stakeholder input?

Key request

AFGA recognizes the need to account for indirect mortality from sportfishing that is the result of both voluntary or regulatory induced adoption of catch and release angling. As was noted in the OSY section there needs to be agreement built through a consensus-based exercise supported by science as to what the appropriate metric (value) should be when implemented into models, frameworks, and research.

Final remarks

At the end of the day the goal of this submission is to create the environment that will lead to a renewed partnership involving AEP and the angling community. This is built on trust, communication, respect, inclusivity, sharing, knowledge, transparency, and engagement.

Appendix: Resources

1. **A Comparison Between South Dakota and North American Standard Sampling Gears in Lakes and Reservoirs** - Bradley J. Smith
2. **A Generic Rule Set for Applying the Alberta Fish Sustainability Index, Second Edition 02/07/2014.**
3. **A Lake and Pond Classification System for the Northeast and Mid-Atlantic States** November 2014 Mark Anderson, Arlene Olivero Sheldon, Alex Jospe - The Nature Conservancy Eastern Regional Office
4. **A review of catch-and-release angling mortality with implications for no-take reserves -** Aaron Bartholomew & James A. Bohnsack July 2005
5. **A review of fish sampling methods commonly used in Canadian freshwater habitats -** C.B. Portt, G.A. Coker, D.L. Ming, and R.G. Randall 2006 - Fisheries and Oceans Canada - Canadian Technical Report of Fisheries and Aquatic Sciences 2604
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