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Proceedings of the Recovery Potential Assessment of Warmouth (*Lepomis gulosus*) in Canada

Meeting date: December 12, 2018

Location: Burlington, ON

Chairperson: Lynn Bouvier

Editor: Dave Andrews

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Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

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SUMMARY

A regional science peer-review meeting was held on December 12th, 2018 in Burlington, Ontario. The purpose of the meeting was to assess the recovery potential of Warmouth (*Lepomis gulosus*) in Canada to provide advice that may be used for a listing decision under the Species at Risk Act, for the development of a recovery strategy and action plan, and to support decision making with regards to the issuance of permits or agreements. Participants included DFO Science and Species at Risk programs, the Ontario Ministry of Natural Resources and Forestry (OMNRF) and several conservation authorities.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated the Warmouth as Special Concern in 1994. A reassessment by the committee in 2015 led to a Endangered designation due to its restricted distribution in Canada, and continuing decline of its preferred vegetated habitat.

This proceedings report summarizes the relevant discussions from the meeting and presents recommended revisions to be made to the associated research document. The Proceedings, Science Advisory Report and Research Documents resulting from this science advisory meeting are published on the [DFO Canadian Science Advisory Secretariat \(CSAS\) website](#).

INTRODUCTION

In April 1994, COSEWIC recommended that Warmouth (*Lepomis gulosus*) be designated as Special Concern. This status was assessed and confirmed in November 2001, and May 2005. In May 2015, Warmouth was assessed and designated Endangered due to its restricted distribution in Canada, and continuing decline of its preferred vegetated habitat. In June 2003, Warmouth was listed on Schedule 1 of the *Species at Risk Act* (SARA) when the Act was proclaimed. Warmouth is currently listed as Special Concern under the *Endangered Species Act, 2007*. A Recovery Potential Assessment (RPA) process has been developed by Fisheries and Oceans Canada (DFO) to provide information and scientific advice needed to fulfill SARA requirements including the development of recovery strategies and authorizations to carry out activities that would otherwise violate SARA (DFO 2007a). The purpose of the meeting, as described in the Terms of Reference (Appendix 1), was to assess the recovery potential of Warmouth. The RPA is a science-based peer review process that assesses the current status of the species by addressing 17 steps in the RPA framework outlined in the Summary section of the Revised Protocol for Conducting Recovery Potential Assessments (DFO 2007a, b). The current state of knowledge about Warmouth habitat requirements, the scope for human-induced mortality, and scenarios for mitigation and alternatives to activities that negatively impact the species and its habitat, is included in the Science Advisory Report. A peer-review meeting was held on December 12th, 2018 to discuss the Warmouth RPA. Meeting participants included DFO (Central and Arctic Region), Ontario Ministry of Natural Resources and Forestry (OMNRF), Conservation Authorities and academic experts (Appendix 2). The meeting followed the agenda outlined in Appendix 3.

DETAILED DISCUSSION

The meeting chair provided the participants with an introduction to the RPA process and explained the purpose of the meeting. This included information on where the RPA process fits with respect to the COSEWIC assessment and SARA listing process for Warmouth. This included the intent of the meeting and how the products of the meeting might be used. Terms of Reference were outlined. Draft research documents entitled “Information in support of a Recovery Potential Assessment of Warmouth (*Lepomis gulosus*) in Canada”, and “Recovery Potential Modelling of Warmouth (*Lepomis gulosus*) in Canada” had been developed by DFO and provided to participants in advance of the meeting. The draft research documents were the basis for discussion, and participants were encouraged to add to or change the material, as needed, to ensure that the best and most up-to-date information was included.

SPECIES DESCRIPTION

Presenter: Dave Andrews

This presentation included information on the description of Warmouth, including morphological characteristics, coloration, lifespan, physiology, diet, and distribution. One participant suggested that lack of detections within Rondeau Provincial Park may be related to permitting and that large fishing effort on the north side of the bay may be due to Bill Glass’ work on Spotted Gar. The same participant noted that fish community work has largely been done in early spring which could be biasing known Warmouth distribution in Rondeau Bay. Another participant suggested that in many cases, gear type and time of year may not have been appropriate for sampling for Warmouth. Another participant commented that Warmouth may not have true low detection rates as there have been no studies in Ontario that have targeted Warmouth. It was

agreed that the statement regarding low detection rates would be removed from the research document.

CURRENT STATUS AND POPULATION ASSESSMENT

Presenter: Dave Andrews

The presentation on population status included relative abundance and population trajectory for all Warmouth populations, as well as the certainty associated with each population. A participant noted the OMNRF has updated bycatch data for Warmouth in fisheries from Long Point Bay and that this data can be shared with the authors for inclusion into the report if warranted. However, this bycatch data should be interpreted carefully as not all bycatch is reported. Recently there has been a push by the fishing industry to report more of the bycatch.

A participant noted that the Lake Erie Management Unit will be starting their own hoop net fishery survey in the spring, so they will start collecting baseline data for Warmouth bycatch soon.

There were some disagreements in the group regarding the relative abundance index and population trajectory for each of the Warmouth populations. Consensus was made amongst participants agreeing to change the relative abundance index to 'Low' for Point Pelee and to 'Medium' for Rondeau Bay populations. It was agreed that the certainty assigned to abundance index for each of the populations is based on expert opinion. As well, it was agreed upon that the population trajectory for all three populations of Warmouth is unknown. This resulted in changes to the population status for each population by way of the population status matrix.

HABITAT REQUIREMENTS: FUNCTIONS, FEATURES, AND ATTRIBUTES TABLE

Presenter: Dave Andrews

The presentation included a description of Warmouth's habitat requirements for three life stages: spawn to hatch, young-of-the-year and juvenile, and adult. Key habitat variables and their functions for each stage were listed. This included the importance of shallow warm water embayments that have abundant submergent aquatic vegetation.

A participant noted that during Bill Glass' work, Warmouth were observed using areas during spawning season that are relatively small in area (i.e., tributaries such as Mill Creek) and that this should be noted in the text. Others argue that spawning areas cannot be positively identified unless there is evidence of nests being built. Another participant stated that these records in question were actually at the lower reaches of the lake. Given they are located at lake level, they act as lacustrine habitat more so than riverine habitat. Consensus was made in the group to change the word "nearshore" in the spawning section to "lower levels of lake reaches".

For the juvenile/young-of-the-year section of the forms, features and attributes table, a participant noted that there is missing data available for Crown Marsh. The participant agreed to share this data and the group discussed what an appropriate size for young-of-the-year would be. The group agreed that 75 mm would be a good bench mark and that fish less than or equal to this value from Crown Marsh will be used to update the research document. In other words, these habitat data associated with fishes less than or equal to 75 mm should be included in the habitat description.

A question was asked by one participant if too much aquatic vegetation is a problem for Warmouth. The answer was not clear. The group seemed to agree that this is possible, but we have very little quantitative habitat data to go on. One participant believes that as macrophyte

diversity increases, so does fish diversity, but that this was his general feeling and not based on actual data.

During the description of adult Warmouth habitat, one participant noted that definitions of appropriate habitat for Warmouth should not be too rigid that habitats that may be used get excluded. Another participant stated that we should be careful when describing habitat given any gear bias that may be occurring. For instance, if fyke nets are only set in waters less than 2 meters in depth, and this is all we have sampled for Warmouth habitat, then it would be a mistake to state that Warmouth only use waters less than 2 m depth as we haven't sampled elsewhere. Therefore it was proposed that minimum and maximum depth of gear used when Warmouth are caught should be reported in the research document. It was noted by a participant that Warmouth habitat models developed by Megan McCusker were not used in this report. It was agreed by the group to include these references.

A participant asked the group if field photos of Warmouth sites could be used to make inferences about other potential habitat. Another participant suggested that there may be a disconnect between surface/emergent vegetation visible in the photo and submergent vegetation that is not visible. A participant noted that we have the ability to see if photos are a potential tool in identifying Warmouth habitat as we have calculated macrophyte density and have field photos to go with these sites. No further field work would be required just a quantitative comparison of submergent aquatic vegetation densities and field photos. This work could be done in the future if it is felt that it could be a useful tool.

RECOVERY POTENTIAL MODELLING FOR WARMOUTH

Presenter: Adam van der Lee

The presentation on recovery potential modeling addressed life cycle and parameter estimates, model sensitivity, recovery targets, recovery effort, and risk of extirpation, as well as uncertainties and science advice on allowable harm. The discussion of recovery targets included recovery target approaches, minimum viable population (MVP) criteria, the selection process for MVP criteria, the effect of catastrophes, extinction thresholds, and habitat targets.

The discussion initially focused on the population growth rate parameter (λ) where one participant asked what parameters are manipulated to obtain to different growth rates. The presenter stated that fecundity and length-at-age data stay the same but mortality increases across all age classes. This led to a brief discussion of assumptions in the model. The presenter said this was done because he did not have any information on the survival rate for Warmouth.

One participant asked why correlation structures were used in this RPA. The presenter stated that it seemed logical since a bad year for an age two fish would likely be a bad year for an age three fish. However, he noted that mortality in larval fish or first year fish may not be correlated which is why an independent correlation structure was also presented. These bad years are based on stochastic events and not anything mechanistic like an overarching threat. Given, the likelihood that first year fish are likely independent from other age classes with respect to mortality, one participant asked if these models could be re-run with young-of-the-year included. The presenter stated that this could be done but that these models take a long time to run.

The lack Warmouth life history data for Canadian populations led one participant to ask why Sunfish life history, in general, isn't used in these models. He asked why the adult stage for Warmouth is more important given that stage-based models show that juvenile stages are important for other fish species. The presenter noted that there is more opportunity for mortality to occur in adult stages of Warmouth given that they are adults for multiple years before they die.

This research paper was accepted with only minor editing revisions for publication on the CSAS website.

THREAT STATUS AND ASSESSMENT

Presenter: Dave Andrews

The presentation on threat status overviewed the likelihood and impact of threats, as well as the causal certainty associated with the threat impact. It was established that threat likelihood of occurrence (LO) would be categorized as “known” (K), “likely” (L), “unlikely” (UL), “remote” (R) or “unknown” (U); threat impact level (LI) would be categorized as “extreme” (E), “high” (H), “medium” (M), “low” (L), or “unknown” (U). The causal certainty (CC) associated with threat level of impact would be categorized as “very high” (1), “high” (2), “medium” (3), “low” (4), or “very low” (5). The threat status was presented for each Warmouth population

During the discussion of natural system modifications with respect to the feeding behavior of common carp, one participant said that Goldfish should be included. This species is abundant in some areas known to support Warmouth.

The aquatic vegetation removal section should be updated to include recent information regarding vegetation removal projects according to one participant. Another participant asked about the current level of vegetation removal in Crown Marsh and elsewhere. A participant responded that there is less removal compared to 2012 but that canals are maintained via dredging and mechanical removal.

During the discussion of human intrusions and disturbance, a participant commented that the research document should consider impacts on Warmouth from the activity of boating itself. This would include potential behavioural impacts as well as impacts to habitat caused by wakes and/or propellers.

Recreational angling has not been a particular concern for Warmouth in the past. However, reports of Warmouth caught by anglers have been received by some of the participants, annually. One participant noted that a creel survey for Lake Erie is long overdue. A historical creel survey will be made available to authors in order to identify if Sunfishes are targeted by recreational fishers in Rondeau Bay. Commercial fishing is more of a concern with respect to Warmouth bycatch. One participant indicated that the OMNRF had collected additional data from this area, and that the data will be provided to the authors to allow for an update of the Biological Resource Use section.

The discussion of invasive species as a threat to Warmouth led to a discussion on how threats are categorized. Indirect threats to Warmouth via habitat modification should not be listed under the Invasive Species category. Because Dreissenids may impact Warmouth habitat, they should be moved to the natural systems modification section. Direct threats via invasive species such as Round Goby competition should be listed under the Invasive Species section instead. This is due to the way COSEWIC categorizes threats which keeps documents consistent.

Climate change was discussed amongst participants and participants noted the discrepancies in Warmouth risk rankings between two publications. A participant suggested that this difference is likely due to the different model/tools used to rank the species. They suggested that Warmouth will probably respond well to warming but that the variability of climate change may not be better for Warmouth. It was noted by the group that McCusker’s habitat model incorporates climate change and should be referenced in this section.

Population-level threat assessment produced much discussion from the group. Consensus was made on changes to the rankings for Natural Systems Modifications. This included changing

causal certainty to a '4' for all populations and the level of impact for this threat was changed to 'medium' for Long Point Bay and 'high' for Rondeau Bay. One participant asked why Phragmites was included under this threat category and it was explained by the authors that this invasive plant is converting useable habitat to non-useable habitat. For Aquatic Vegetation Removal, participants felt that the level of impact for Rondeau bay should be changed to 'high' and for Point Pelee it should be changed to 'low'. A participant asked about mechanical vegetation removal at Long Point and how it might physically affect Warmouth. A participant responded that young-of-the-year are likely to be killed if using areas with Phragmites, but that the area that receives mechanical removal is low (~20%) for Warmouth habitat at Long Point. For this reason, the population-level threat extent was changed to 'narrow' for this threat for the Long Point Bay population. Pollution as a threat was then discussed for each population and one participant felt that the level of impact for Rondeau Bay should be higher. The group agreed that it should be changed from 'low' to 'medium' based on higher nutrient levels there compared to the other two populations. Another participant asked about dichlorodiphenyltrichloroethane (DDT) levels at Point Pelee and another participant responded saying that although there are hotspots, there isn't much DDT in the water column. Concern was raised by a participant regarding the likelihood of occurrence of invasive species as a threat to each population. Consensus was made among participants to change the likelihood of occurrence for each population from 'unlikely' to 'unknown' given the lack of information that is currently available on this subject matter. The presenter then stated that the level of impact for each population with respect to climate change was a typo and should read as 'known' for each population. This was agreed upon by all participants. Participants also spoke to the uncertainty around each of the threats and felt that causal certainty should be changed to 'low' for all threats for all populations. The group agreed that this change should be made in the research document. One participant noted that Warmouth will do better in a warmer environment but that there is a trade-off as models show that warming will also lead to a decrease in the amount of Warmouth habitat. With respect to human disturbance as a threat category, one participant noted that boating is much more prevalent at Rondeau and Long Point in comparison to Point Pelee. This initiated much discussion with most participants agreeing that boat traffic was localized for these two populations and do not warrant a level of impact any higher than 'low'.

REVIEW OF PROJECTS AND ACTIVITIES IN WARMOUTH HABITAT

Presenter: Dave Balint

The review of projects and activities summarized all works, projects and activities that took place in Warmouth habitat from 2013–2018. This included water crossings, shoreline stabilization, channel maintenance, etc. Participants discussed the application of diquat as a herbicide and whether this is covered. The presenter noted that this gets included. There was some discussion about mitigations for work along shorelines. The presenter stated that the standard practice is to exclude fish from your area and avoid Warmouth nesting grounds while using sediment stabilization controls. A participant also asked about future work for Rondeau, Long Point, and Point Pelee. The presenter stated that dredging activities are expected for Rondeau and Turkey Marsh. There will also be future Phragmites removal. No immediate water drawdowns are expected but this could occur further down the road, particularly in Big Creek Marsh. The presenter stated that future Phragmites removal at Big Creek Marsh will likely include water draw downs. One participant asked how the level of future project activity might impact Warmouth and the presenter stated that the level of activity won't be much different than what is currently being done.

MITIGATION OF THREATS AND ALTERNATIVES TO ACTIVITIES

Presenter: Dave Andrews

Standard methods of mitigation were reviewed, and possible alternatives and new methods were discussed. During the discussion of mitigation options, one participant asked to change the wording of “voluntary” avoidance of Warmouth habitat to “prohibit”. Others at the meeting explained that this would be ill advised as we cannot prohibit commercial fishers. However, it was noted that it’s possible to prohibit fishing where Warmouth exists during spawning season and to restrict certain gear types.

SOURCES OF UNCERTAINTY

Presenter: Dave Andrews

The presentation addressed sources of uncertainty related to Warmouth life cycle, habitat needs, population abundance, and distribution. This included gaps in our knowledge of nursery grounds, habitat requirements for each life stage, impacts of threats, and thresholds for water quality parameters such as dissolved oxygen and turbidity. One participant asked who these uncertainties are directed at. Another respondent stated that this will be used by management in the creation of recovery plans as well as by the department in the listing decision process.

CONCLUDING REMARKS AND NEXT STEPS

The Chair reviewed the Terms of Reference (Appendix 1) which included population status assessment, assessing habitat use, the threats to recovery, determining scenarios for mitigation and alternatives to activities, proving recovery targets, and assessing allowable harm as it relates to Warmouth populations in Canada. It was agreed upon by the meeting participants that Elements 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 21, and 22 were adequately covered during the meeting. Element 6 was discussed but not included in the report. The Chair noted that for Element 17 there is a knowledge gap that will need to be addressed in the future. Element 18 was not discussed at the meeting as the participants were unable to have an informed discussion on the topic. Element 19 was not covered during the meeting. The Chair stated that there was not enough information to achieve Element 20.

The Chair thanked all participants for their input into the discussions, next steps were discussed, and the meeting was adjourned.

REFERENCES CITED

- DFO. 2007a. [Revised protocol for conducting recovery potential assessments](#). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2007/039.
- DFO. 2007b. [Documenting habitat use of species at risk and quantifying habitat quality](#). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2007/038.

APPENDIX 1. TERMS OF REFERENCE

Recovery Potential Assessment – Warmouth (*Lepomis gulosus*)

Regional Peer Review Meeting – Central and Arctic Region

December 12, 2018
Burlington, ON

Chairperson: Lynn Bouvier

Context

After the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses an aquatic species as Threatened, Endangered or Extirpated, Fisheries and Oceans Canada (DFO) undertakes a number of actions required to support implementation of the *Species at Risk Act* (SARA). Many of these actions require scientific information on the current status of the wildlife species, threats to its survival and recovery, and the feasibility of recovery. Formulation of this scientific advice has typically been developed through a Recovery Potential Assessment (RPA) that is conducted shortly after the COSEWIC assessment. This timing allows for consideration of peer-reviewed scientific analyses into SARA processes including recovery planning.

In support of listing recommendations for Warmouth by the Minister, DFO Science has been asked to undertake an RPA, based on the national RPA Guidance. The advice in the RPA may be used to inform both scientific and socio-economic aspects of the listing decision, development of a recovery strategy and action plan, and to support decision making with regards to the issuance of permits or agreements, and the formulation of exemptions and related conditions, as per sections 73, 74, 75, 77, 78 and 83(4) of SARA. The advice in the RPA may also be used to prepare for the reporting requirements of SARA s.55. The advice generated via this process will update and/or consolidate any existing advice regarding the Warmouth.

Objective

- To provide up-to-date information, and associated uncertainties, to address the following elements:

Biology, Abundance, Distribution and Life History Parameters

Element 1: Summarize the biology of Warmouth.

Element 2: Evaluate the recent species trajectory for abundance, distribution and number of populations.

Element 3: Estimate the current or recent life-history parameters for Warmouth.

Habitat and Residence Requirements

Element 4: Describe the habitat properties that Warmouth needs for successful completion of all life-history stages. Describe the function(s), feature(s), and attribute(s) of the habitat, and quantify by how much the biological function(s) that specific habitat feature(s) provides varies with the state or amount of habitat, including carrying capacity limits, if any.

Element 5: Provide information on the spatial extent of the areas in Warmouth's distribution that are likely to have these habitat properties.

Element 6: Quantify the presence and extent of spatial configuration constraints, if any, such as connectivity, barriers to access, etc.

Element 7: Evaluate to what extent the concept of residence applies to the species, and if so, describe the species' residence.

Threats and Limiting Factors to the Survival and Recovery of Warmouth

Element 8: Assess and prioritize the threats to the survival and recovery of the Warmouth.

Element 9: Identify the activities most likely to threaten (i.e., damage or destroy) the habitat properties identified in elements 4-5 and provide information on the extent and consequences of these activities.

Element 10: Assess any natural factors that will limit the survival and recovery of the Warmouth.

Element 11: Discuss the potential ecological impacts of the threats identified in element 8 to the target species and other co-occurring species. List the possible benefits and disadvantages to the target species and other co-occurring species that may occur if the threats are abated. Identify existing monitoring efforts for the target species and other co-occurring species associated with each of the threats, and identify any knowledge gaps.

Recovery Targets

Element 12: Propose candidate abundance and distribution target(s) for recovery.

Element 13: Project expected population trajectories over a scientifically reasonable time frame (minimum of 10 years), and trajectories over time to the potential recovery target(s), given current Warmouth population dynamics parameters.

Element 14: Provide advice on the degree to which supply of suitable habitat meets the demands of the species both at present and when the species reaches the potential recovery target(s) identified in element 12.

Element 15: Assess the probability that the potential recovery target(s) can be achieved under current rates of population dynamics parameters, and how that probability would vary with different mortality (especially lower) and productivity (especially higher) parameters.

Scenarios for Mitigation of Threats and Alternatives to Activities

Element 16: Develop an inventory of feasible mitigation measures and reasonable alternatives to the activities that are threats to the species and its habitat (as identified in elements 8 and 10).

Element 17: Develop an inventory of activities that could increase the productivity or survivorship parameters (as identified in elements 3 and 15).

Element 18: If current habitat supply may be insufficient to achieve recovery targets (see element 14), provide advice on the feasibility of restoring the habitat to higher values. Advice must be provided in the context of all available options for achieving abundance and distribution targets.

Element 19: Estimate the reduction in mortality rate expected by each of the mitigation measures or alternatives in element 16 and the increase in productivity or survivorship associated with each measure in element 17.

Element 20: Project expected population trajectory (and uncertainties) over a scientifically reasonable time frame and to the time of reaching recovery targets, given mortality rates and productivities associated with the specific measures identified for exploration in element 19.

Include those that provide as high a probability of survivorship and recovery as possible for biologically realistic parameter values.

Element 21: Recommend parameter values for population productivity and starting mortality rates and, where necessary, specialized features of population models that would be required to allow exploration of additional scenarios as part of the assessment of economic, social, and cultural impacts in support of the listing process.

Allowable Harm Assessment

Element 22: Evaluate maximum human-induced mortality and habitat destruction that the species can sustain without jeopardizing its survival or recovery.

Expected Publications

- Science Advisory Report
- Proceedings
- Research Document(s)

Participants

- Fisheries and Oceans Canada (Science Sector, Species at Risk Program, and Fisheries Protection Program)
- Ontario Ministry of Natural Resources and Forestry
- Academics
- Conservation Authorities
- Other invited experts

APPENDIX 2. LIST OF PARTICIPANTS

Name	Organization/Affiliation
Dave Andrews	DFO - Science (Editor)
Lynn Bouvier	DFO – Science (Chairperson)
Adam van der Lee	DFO – Science
Andrew Drake	DFO – Science
Marten Koops	DFO – Science
Jofina Victor	DFO – Science
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Sara Eddy	DFO – Fish and Fish Habitat Protection Program
Lisa Wren	DFO – Fish and Fish Habitat Protection Program
Amy Boyko	DFO – Species at Risk Management Program
Dave Balint	DFO – Species at Risk Management Program
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Chelsea May	Ontario Ministry of Natural Resources and Forestry
Vicki McKay	Lower Thames Valley Conservation Authority
Tarra Degazio	Point Pelee National Park

APPENDIX 3. AGENDA

Recovery Potential Assessment – Warmouth

Regional Peer Review Meeting – Central and Arctic Region

Canada Centre for Inland Waters, 867 Lakeshore Rd., Burlington, ON

December 12th 2018

Chairperson: Lynn Bouvier

South Seminar Room (L225S)		Presenter
9:00	Welcome and Introductions	L. Bouvier
9:15	Purpose of Meeting	L. Bouvier
9:30	Species Description	D. Andrews
9:45	Current Status and Population Assessment	D. Andrews
10:00	Habitat Requirements; Functions, Features and Attributes Table	D. Andrews
10:45	Break	-
11:00	Recovery Potential Modelling	A. van der Lee
12:00	Lunch	-
13:00	Threat Status	D. Andrews
14:15	Review of Projects and Activities in Warmouth Habitat	D. Balint
14:30	Mitigation of Threats And Alternatives to Activities	D. Andrews
15:00	Break	-
15:15	Sources of Uncertainty	D. Andrews
15:45	Review of Terms of Reference	L. Bouvier
16:15	End of Meeting	-
