

Invasive Crayfish Collaborative Member Needs Assessment

Job Completion Report

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Executive Summary

This study is an assessment of the research and outreach needs of members of the Invasive Crayfish Collaborative (ICC), an organization established to address the problem of invasive crayfish in the Great Lakes Region. Two separate web-based surveys were conducted to assess members' needs associated with research and outreach, and preferences for ICC governance. A modified Delphi method was used for the study design. Open ended questions were posed to ICC members in the first-round survey, and emergent themes determined from coding of results. In the second round survey, ICC members ranked and rated these themes in terms of their importance.

The results revealed several areas of importance for ICC research and outreach. Needs to establish working knowledge of basic crayfish biology, and distribution in the Great Lakes Region were deemed important research topics by ICC members. Members also considered the identification of pathways for the introduction of non-native crayfish an important area for research. Members' priorities for outreach included the development of educational materials that convey best practices for the handling and disposal of non-native crayfish, and targeted engagement with pet suppliers, bait retailers, and policy makers.

Background

The Invasive Crayfish Collaborative (ICC) was established to build the research and outreach capacity needed to manage the threat of invasive crayfish in the Great Lakes Region. The ICC consists of a variety of stakeholders with an interest in invasive crayfish management including state and federal natural resource management agency personnel, representatives of the pet and live bait industries, and university faculty, among others. This study was conducted to determine the needs and preferences of this collective as they relate to the conduct of the ICC. It is intended that the results documented in this report will frame future directions for the ICC.

Methods

An assessment of ICC member needs was conducted using two separate online surveys. In the first survey, 67 ICC members were contacted to participate through an email invitation. One reminder was furnished to non-respondents. Thirty complete responses were obtained for an effective response rate of 45%. The first round questionnaire queried members preferences for ICC governance, meetings, and website content, as well as research, and outreach needs, goals for participation, and experiences with invasive crayfish (Appendix A). Respondents also provided open ended responses to questions about their perceived priorities for research and outreach, and the goals they would like to see the ICC achieve in the near and long-term. These responses were subject to content analysis to determine emergent themes, and results used to frame the second round survey (Appendix B).

In the second round survey, 67 ICC members were contacted to participate, 21 responded for an effective response rate of 31%. In the second round questionnaire members were asked to provide two forms of evaluation of the themes that emerged from the round 1 open ended questions. First, respondents ranked each set of members perceived priorities for research,

outreach, and goals for the ICC. Second, each of the emergent themes was given an importance rating on its own. The two forms of evaluation were used to triangulate both the marginal and absolute levels of importance of each theme to ICC members (Appendix C).

Results

Round 1 Survey

When asked “what category best reflects the organization that you are affiliated with” 26.7% of respondents indicated that they work for a federal agency, while 36.7% of respondents were associated with a state agency or academia respectively (Table 1). No respondents reported an affiliation with an NGO, tribal government, or with industry.

Table 1. Professional affiliation of ICC members ($n=30$)

Affiliation	Percent
Federal Agency (e.g., U.S. Fish and Wildlife Service)	26.7%
State Agency (e.g., Illinois Department of Natural Resources)	36.7%
Academia (e.g., university faculty)	36.7%
Tribal government	0.0%
Non-governmental agency	0.0%

Respondents were asked what category best reflects their role in their organization (Table 2). Forty-percent identified themselves as a “researcher”, while 16.7% identified with “outreach/educator”, and 23.3% as “manager/administrator.” Twenty-percent of respondents indicated that they served in some other role. Two respondents reported “faculty” as their primary role within their organization, and two others identified their role as “program staff.”

Table 2. Primary role within professional organization ($n=30$)

Role	Percent
Researcher	40.0%
Manager/administrator	23.3%
Educator/outreach	16.7%
Other ¹	20.0%

¹Other responses included “program staff”, and “faculty”

Thirteen-percent of respondents reported that their organization is currently managing a populations of invasive crayfish that is present within their jurisdiction when asked “does your organization manage, or is it intending to manage, a known population of invasive crayfish in its jurisdiction?” Twenty-percent reported that they have an intent to manage a known population but are not currently doing so. Forty-percent of respondents indicated that no known population of invasive crayfish is present in the jurisdiction of their managing agency, and 26.7% reported that the question was not applicable (Table 3).

Table 3. Organization current status managing invasive crayfish ($n=30$)

Current management	Percent
Yes, currently managing	13.3%
Yes, planning to undertake management actions, but not currently managing	20.0%
No, invasive crayfish present, no active plans to manage	0.0%
No, invasive crayfish not present	40.0%
Not applicable	26.7%

Of those individuals that reported that they are currently managing invasive crayfish, some of the most common methods of control respondents identified included live trapping, chemical control, monitoring, regulatory/policy work and public education. Members identified several ways that the ICC can help facilitate the control of invasive crayfish including: providing up-to-date information on species, methods of identification and their distributions; information on best management practices and different methods of control; making research findings easily accessible and providing a platform for the dissemination of members’ research; improve identification skills of retailers; facilitate interagency and individual discussions/collaboration.

When asked if members' organizations disseminated information about invasive crayfish, 34.5% reported that they generated and disseminated primary information through their organization website (Table 4). A smaller number, 6.9%, reported that they linked to other people's work either through their website or social media, and 31.4% indicated that their organization did not engage in the dissemination of information about invasive crayfish. Others (27.6%), reported that their agencies disseminated information about invasive crayfish through other avenues including peer-reviewed journals, print media, and angling regulations among others.

Members identified several personal goals for participation in the ICC. These goals include: raising the visibility of the "GLANSIS" database; contributing to research on knowledge gaps surrounding invasive crayfish; connecting with colleagues working on invasive crayfish issues; improve retailer awareness of invasive crayfish issues; get research funded; build partnerships; expand ICC scope to include St. Lawrence river basin; conduct invasion risks assessments; generate improved distribution maps; and improve understanding of inter-agency cooperation. ICC members felt that the organization could help them meet these goals by: providing funding opportunities; facilitating interactions and opportunities for collaboration among members; providing a platform for the dissemination of the most up-to-date information on species biology, distributions, and methods of control.

Table 4. Mode of information dissemination ICC members' organizations engage in ($n=29$)

Mode	Percent
Generate primary information and disseminate through website	34.5%
Link to others' work through website and/or social media	6.9%
Does not engage in information dissemination	31.4%
Other ¹	27.6%

¹Other responses included "peer-reviewed literature" and "angling regulations"

The majority of respondents (63.6%) preferred that ICC governance proceed according to a simple majority rule for decision making (e.g., in committees). Whereas, 27.3% of respondents indicated a preference for consensus as a decision criteria. Other respondents (9.1%) reported that they would prefer a large majority (e.g., ~75%) or allowing committees to make decisions on simple matters (Table 5).

Table 5. Preference for ICC governance and decision making ($n=22$)

Preference	Percent
Majority rule	63.6%
Consensus	27.3%
Executive authority	0.0%
Other ¹	9.1%

¹Other responses included “large majority (e.g., >75%)” and “committee authority”

Fifty-nine percent of respondents indicated that they have the financial support needed to attend an ICC event (Table 6). Alternatively, 47.8% of members that responded to the survey reported that they would need financial support in order to attend ICC events. No members reported that they would not be able to attend regardless of their financial circumstances.

Table 6. ICC members’ financial support to travel to ICC events

	Percent Yes	<i>n</i>
I have internal financial support to travel to ICC events	59.0%	23
I would need a travel grant to be able to attend an ICC event	47.8%	22
I will not be able to travel to attend an ICC event regardless of finances	0.0%	20

The vast majority (80.8%) of respondents preferred that future meetings for the ICC occur as some mix of an online and in-person format (Table 7). A smaller number of individuals (15.4%) preferred that future meetings occur only online, and 3.9% preferred some other format.

Table 7. Preference for future meeting formats ($n=26$)

Preference	Percent
In-person	15.4%
Online	0.0%
A mix of in-person and online	80.8%
Other	3.9%

When asked preferences for the format of the ICC after the completion of the original funding in 2019, 32% of respondents reported that the ICC should pursue additional external grants (Table 8). Sixteen-percent reported that they preferred to see the ICC transition into a volunteer led organization. Twenty-eight percent preferred a working group composed of agency personnel, and 24% indicated a preference for some other alternative.

Table 8. Preference for ICC funding and governance after original grant ($n=25$)

Preference	Percent
Create a fee-based membership, and pay a facilitator from dues	0.0%
Pursue additional external grants	32.0%
Create a volunteer-led organization	16.0%
Transition to a working group consisting of agency personnel	28.0%
Other	24.0%

¹Other responses included combinations of other options (e.g., agency working group/pursue grants).

Sixty-four percent of respondents either agreed or strongly agreed with the statement “a citizen science monitoring program for invasive crayfish will produce valuable scientific data.” A similar majority of respondents (68%) believed that developing a citizen science monitoring program is worth the effort. Finally, 84% of the respondents were in agreement that citizens can play an important role in monitoring for invasive crayfish (Table 9).

Table 9. Beliefs about citizen science programs for invasive crayfish

	Percent Agree or Strongly Agree	n
A citizen science monitoring program for invasive crayfish will produce valuable scientific data	64.0%	25
Developing a citizen science monitoring program for invasive crayfish is worth the effort	68.0%	25
Citizens can play an important role in monitoring invasive crayfish	84.0%	25

Open-Ended Responses

Each heading in the section to follow corresponds to an open ended question that was presented to ICC members in the first round questionnaire. Emergent themes associated with members' responses to these questions were identified. Themes are presented as numbered bullets under each heading. All raw responses to open ended questions and emergent themes are presented in Appendix B.

In the second round questionnaire, ICC members were asked to rank the themes that emerged for each question in terms of its priority, and rate the importance of each theme. Exact wording for ranking and rating questions can be found in Appendix C. Results for these analyses are presented under each heading as well. The numbered themes under each heading correspond to the numbers listed in the tables of ranking and rating.

Research Priorities

Question: What do you feel are the most pressing research needs surrounding invasive crayfish in the Great Lakes region?

Emergent Themes

- 1) A need to better understand the basic biology of both native and invasive crayfish, including life history traits, the environmental conditions that influence species' distributions, the potential for non-native crayfish to become invasive and the vulnerability of native species to invasion.
- 2) A need to develop accurate distribution maps of the currently occupied ranges of native and invasive crayfish.
- 3) A need to develop a better understanding of the effectiveness of various methods for the control of invasive crayfish, including costs, impacts on non-target species and native crayfish and aquatic ecosystems, and methods for detection.
- 4) A need to develop an understanding of the impacts of invasive crayfish on aquatic ecosystems and native crayfish.
- 5) An understanding of various pathways for the introduction of invasive crayfish, including the diversity of crayfish in use in the pet and fish bait industries, associated supply chains, and end uses of non-native crayfish species among the public.

Table 10. Mean ranking and rating of ICC research needs

Theme*	Mean Ranking	<i>n</i>	Mean Rating	<i>n</i>
Research Need 1	2.89(1.52)	19	73.29(23.01)	21
Research Need 2	3.11(1.76)	19	67.29(27.60)	21
Research Need 5	3.16(1.83)	19	81.86(20.41)	21
Research Need 3	3.79(1.69)	19	78.90(20.83)	21
Research Need 6	3.89(1.79)	19	68.14(20.53)	21
Research Need 4	4.16(1.50)	19	70.48(22.20)	21

*Themes correspond to descriptions above. Mean rankings are out of a possible 6; rankings ordered from highest rank (lowest value) to lowest rank

Outreach Priorities

Question: What do you feel are the most pressing outreach needs for citizens (e.g., anglers, pet owners, retailers), managers, and policy makers with respect to invasive crayfish?

Emergent Themes

- 1) A need to establish protocols for the rigorous evaluation of current (and future) outreach campaigns with respect to their relative abilities to change stakeholders' knowledge, attitudes, behaviors related to invasive crayfish spread, mitigation and management.
- 2) A need to develop educational materials that convey to stakeholders appropriate methods for the safe handling and/or disposal of unwanted pet and/or bait, and a code responsible behavior for the possession care, and disposal of invasive crayfish to inform outreach efforts.
- 3) A need to develop educational materials that convey to stakeholders the diversity of native and non-native crayfish present in the Great Lakes region, how to identify different species, the ecological and economic impacts of invasive crayfish in aquatic ecosystems, and options for reporting invasive crayfish to early detection programs.
- 4) A need to make new and existing educational materials accessible to diverse stakeholders with respect to language, academic content, and availability.
- 5) A need to conduct targeted outreach to biological supply companies and pet traders that are marketing live invasive crayfish, determine the prevalence of the practice (especially for emerging species of concern) and strengthen partnerships with industry.
- 6) A need to develop guidelines for the establishment of new, and enforcement of existing, non-release laws surrounding invasive crayfish (e.g., Wisconsin NR40), and to conduct targeted outreach to convey the difficulties of managing invasive crayfish to decision makers.
- 7) A need to develop mechanisms for the engagement of trained citizen scientists in invasive crayfish identification and reporting.
- 8) A need to Compile information for managers regarding the state of knowledge surrounding best practices for invasive crayfish control and monitoring and their relative efficacy.

Table 11. Mean ranking and rating of ICC outreach priorities

Theme*	Mean Ranking	<i>n</i>	Mean Rating	<i>n</i>
Outreach Need 2	3.20(2.12)	20	74.95(22.27)	21
Outreach Need 5	3.55(2.11)	20	81.14(17.77)	21
Outreach Need 6	4.00(2.08)	20	74.43(22.48)	21
Outreach Need 4	4.70(1.72)	20	64.52(24.79)	21
Outreach Need 8	4.75(2.84)	20	71.43(23.94)	21
Outreach Need 1	4.90(2.00)	20	57.52(23.53)	21
Outreach Need 3	5.15(2.30)	20	58.33(24.57)	21
Outreach Need 7	5.75(2.29)	20	58.62(21.64)	21

*Themes correspond to descriptions above. Mean rankings are out of a possible 8; rankings ordered from highest rank (lowest value) to lowest rank

Short-term Goals for the ICC (next 18 months)

Question: What do you feel are the most important goals the ICC should strive to achieve during the next 18 months?

Emergent Themes

- 1) Create a code of best management practices for various stakeholders with respect to invasive crayfish control, monitoring, handling, and prevention and outreach.
- 2) Generate accurate current and/or historical distribution maps of native and invasive crayfish species.
- 3) Develop a network of individuals working in the areas of crayfish biology, management, extension, and business, including a framework for the sharing of resources among members and agencies. Ensure network members are up to date on best science, and agree on the scope of the problem surrounding invasive crayfish, including targeted measures for addressing it. Identify knowledge gaps.
- 4) Development of an outreach model that will increase the level of public awareness surrounding invasive crayfish, and leverage partnerships with industry to reduce the risk of future invasions from pet/bait sources.

Table 12. Mean ranking and rating of ICC short-term goals

Theme*	Mean Ranking	<i>n</i>	Mean Rating	<i>n</i>
18-month Goal 3	2.15(1.23)	20	85.76(13.50)	21
18-month Goal 2	2.40(1.19)	20	67.42(30.00)	21
18-month Goal 4	2.65(0.86)	20	79.00(13.44)	21
18-month Goal 1	2.80(1.15)	20	68.43(21.39)	21

*Themes correspond to descriptions above. Mean rankings are out of a possible 4; rankings ordered from highest rank (lowest value) to lowest rank

Long-term Goals for the ICC

Question: What do you feel are the most important long-term goals for the ICC?

Emergent Themes

- 1) Identify knowledge gaps and priorities for research with respect to invasive crayfish, and establish funding mechanism for collaborators to conduct associated research.
- 2) Develop interactive and updatable GIS database that contains distribution information for native and invasive crayfish species.
- 3) Partner with policy makers to develop appropriate, regionally coordinated, regulations surrounding invasive crayfish.
- 4) Develop comprehensive online resource for the storage, collection, and dissemination of invasive crayfish related information including species distributions, mechanisms for control, methods for monitoring, identification, research reports, risk assessments, prevention, and outreach, and means for information exchange between researchers and the public.
- 5) Establish citizen science monitoring program and develop mechanism for public engagement in research and monitoring.
- 6) Develop a comprehensive understanding of pathways for introduction.
- 7) Develop measureable and achievable targets for public outreach, education and engagement, including ICC collaboration with decision makers/managers, retailers and retailer education.
- 8) Develop coordinated plan for the monitoring and management of invasive crayfish. Reduce and or eliminate targeted populations where/if feasible.
- 9) Develop mechanisms for the prevention of new introductions of invasive crayfish.

Table 13. Mean ranking and rating of ICC long-term goals

Theme*	Mean Ranking	<i>n</i>	Mean Rating	<i>n</i>
Long-term Goal 1	2.74(1.97)	19	79.60(20.31)	20
Long-term Goal 3	4.52(2.72)	19	72.75(19.13)	20
Long-term Goal 9	4.58(2.92)	19	86.30(14.95)	20
Long-term Goal 6	4.74(2.51)	19	79.35(18.75)	20
Long-term Goal 8	5.00(2.45)	19	80.70(18.62)	20
Long-term Goal 4	5.21(2.37)	19	62.35(29.47)	20
Long-term Goal 2	5.26(2.75)	19	54.55(33.46)	20
Long-term Goal 7	5.95(2.46)	19	65.65(19.28)	20
Long-term Goal 5	7.00(2.03)	19	52.05(26.58)	20

*Themes correspond to descriptions above. Mean rankings are out of a possible 9; rankings ordered from highest rank (lowest value) to lowest rank

Criteria to Consider When Recommending Best Management Practices

Question: What criteria(s) (e.g., cost, effectiveness, specificity) should the ICC consider when developing potential best management practices for invasive crayfish control?

Emergent Themes

- 1) Cost (financial and/or labor/ease of implementation)
- 2) Efficacy, including longevity.
- 3) Specificity to target species, limited impacts on native species.
- 4) Scale of geographic relevance (e.g., practice works in multiple systems).
- 5) Public acceptability of practice.

Table 14. Mean ranking and rating of criteria for considering best management practices

Theme*	Mean Ranking	<i>n</i>	Mean Rating	<i>n</i>
BMP Criteria 2	1.63(1.16)	19	91.65(09.05)	20
BMP Criteria 1	2.84(0.83)	19	75.30(20.32)	20
BMP Criteria 3	2.95(1.18)	19	83.85(16.66)	20
BMP Criteria 5	3.58(1.61)	19	75.60(18.09)	20
BMP Criteria 4	4.00(1.05)	19	66.95(22.33)	20

*Themes correspond to descriptions above. Mean rankings are out of a possible 5; rankings ordered from highest rank (lowest value) to lowest rank

Tools for Management the ICC Should Develop

Question: What tools for management (e.g., monitoring protocols, rapid response plans) can the ICC help to produce that will improve the ability to control invasive crayfish?

Emergent Themes

- 1) Identification guide, outreach materials for the public, interactive distribution maps.
- 2) Coordinated, standardized, rapid response plan to implement in the case of invasion. Including publicity materials for managers to justify action.
- 3) Coordinated and standardized, monitoring protocol. Including option for citizen engagement. Environmental DNA monitoring tools.
- 4) A comprehensive invasive crayfish management plan/document.

Table 15. Mean ranking and rating of potential management tools ICC should develop

Theme*	Mean Ranking	<i>n</i>	Mean Rating	<i>n</i>
MGMT Tool 2	2.16(1.21)	19	79.50(21.58)	20
MGMT Tool 4	2.42(1.17)	19	73.35(22.88)	20
MGMT Tool 3	2.68(1.00)	19	71.40(21.60)	20
MGMT Tool 1	2.74(1.10)	19	62.30(21.59)	20

*Themes correspond to descriptions above. Mean rankings are out of a possible 4; rankings ordered from highest rank (lowest value) to lowest rank

Policy Needs ICC Can Help Address

Question: Are there any immediate policy needs surrounding invasive crayfish the ICC can help develop?

Emergent Themes

- 1) Recommendations/support for regulations surrounding the possession, sale, collection, importation, exportation of live invasive crayfish. Update existing regulations to include emerging species of concern.
- 2) Encourage enforcement where current regulations exist.
- 3) Generate mechanism for educating anglers at the point of sale regarding invasive crayfish, and associated regulation.
- 4) Standardization of regulations across region and by species.
- 5) Conduct gap analysis of existing regulations surrounding invasive crayfish by state. Identify areas for improvement/standardization/adaptation. Comparison of the efficacy of existing regulations.

Table 16. Mean ranking and rating of policy needs ICC should help address

Theme*	Mean Ranking	<i>n</i>	Mean Rating	<i>n</i>
Policy Need 5	2.27(1.32)	18	87.53(13.04)	20
Policy Need 1	2.39(1.29)	18	78.35(23.95)	20
Policy Need 3	2.89(1.57)	18	74.65(22.03)	20
Policy Need 2	3.33(1.08)	18	69.30(27.43)	20
Policy Need 4	4.11(1.08)	18	64.20(29.19)	19

*Themes correspond to descriptions above. Mean rankings are out of a possible 5; rankings ordered from highest rank (lowest value) to lowest rank

Material for the ICC Website

Question: What resources would you like to see available through the ICC website?

Emergent Themes

- 1) Links to species profiles (e.g., GLANSIS) and other already available materials online. Including state and federal regulations, research labs websites/profiles.
- 2) Materials on crayfish identification and distribution. Fact-sheets for public.
- 3) List of members/experts, profiles containing contact info, areas of expertise, geographic location. Mechanism for interactions among members (e.g., discussion board, listserv). Options for public inquiries and new members to join.
- 4) Clearinghouse of invasive crayfish research. Research abstracts, links to publications, reports.
- 5) ICC goals, mission etc. Agendas from meetings, summaries of discussions. Upcoming meetings.
- 6) Management toolbox, case studies on effective control. Control options. Best management practices guidelines.

Table 17. Mean ranking and rating of potential website resources

Theme*	Mean Ranking	<i>n</i>	Mean Rating	<i>n</i>
Website 1	2.74(1.56)	19	74.45(18.59)	20
Website 6	3.00(1.80)	19	84.45(21.12)	20
Website 2	3.00(1.73)	19	68.95(25.89)	20
Website 3	3.74(1.33)	19	68.10(25.29)	19
Website 5	4.05(1.75)	19	68.95(25.33)	20
Website 4	4.47(1.58)	19	63.11(28.45)	20

*Themes correspond to descriptions above. Mean rankings are out of a possible 6; rankings ordered from highest rank (lowest value) to lowest rank

Appendix A. Round 1 Questionnaire. [variable names in data]

1. What category best reflects the organization you are affiliated with? [**Affiliation**]

1. Federal agency (e.g., U.S. Fish and Wildlife Service)
2. State agency (e.g., Illinois Department of Natural Resources)
3. Academia (e.g., University faculty/researcher)
4. Tribal government _____ [**Affiliation_tribal_text**]
5. Non-governmental agency (e.g., The Nature Conservancy)
6. Industry
7. Other _____ [**Affiliation_other_text**]

2. What best describes your role in this organization? [**OrgRole**]

1. Researcher
2. Outreach/Educator
3. Manager/Administrator
4. Owner
5. Other _____ [**OrgRole_other_text**]

3. Does your organization currently manage, or is it intending to manage, a known population of invasive crayfish in its jurisdiction? [**OrgManageCrayfish**]

1. Yes, currently managing
2. Yes, planning to undertake management actions, but not currently managing
3. No, invasive crayfish not present
4. Not applicable (i.e., not a natural resource management agency)

3a. What management actions are you currently using to manage invasive crayfish?

_____ [**OrgManageCrayfish_current_text**]

3b. What management actions do you intend to implement to manage invasive crayfish?

_____ [**OrgManageCrayfish_intend_text**]

4. Is there anything the ICC can do to help facilitate your efforts to control invasive crayfish?

_____ [**FacilitateControl_text**]

5. Does your institution produce or compile information about invasive crayfish that is disseminated to stakeholder? [**CompileInfoCrayfish**]

1. Yes, we generate and distribute information through our website
2. Yes, we link to others work through social media and/or our website
3. No
4. Other _____ [**CompileInfoCrayfish_other_text**]

6. What do you feel are the most pressing research needs surrounding invasive crayfish in the Great Lakes Region. **[ResearchNeeds_text]**

7. What do you feel are the most pressing outreach needs for citizens (e.g., anglers, pet owners, retailers), managers, and policy makers with respect to invasive crayfish? **[OutreachNeeds_text]**

8. What do you perceive to be the biggest knowledge gaps with respect to invasive crayfish relevant to your role in your organization? **[KnowledgeGaps_text]**

9. What do you feel are the most important goals the ICC should strive to complete in the next 18 months? **[ICCGoals18Months_text]**

10. What do you feel are the most important long-term goals for the ICC? **[ICCGoalsLongterm_text]**

11. What goals would you like to accomplish through your participation in the ICC? **[PersonalGoals_text]**

12. How can the ICC help you to achieve the goals you would like to accomplish through your participation? **[HelpPersonalGoals_text]**

13. What criteria(s) (e.g., cost, effectiveness, specificity) should the ICC consider when developing potential best management practices for invasive crayfish control? **[BMPCriteria_text]**

14. What tools for management (e.g., monitoring protocols, rapid response plans) can the ICC help to produce that will improve the ability to control invasive crayfish? **[MgmtTools_text]**

15. Are there any immediate policy needs surrounding invasive crayfish management the ICC can help develop? [**PolicyNeeds_text**]

16. What resource would you like to see available through the ICC website? [**WebsiteResources_text**]

17. It is intended that the ICC will operate through some form of self-governance. What organizational structure do you feel is most appropriate? [**GovernanceStructure_text**]

18. What rule should be applied to decision making for committees/membership? [**DecisionStructure**]

1. Consensus must be reached
2. Majority rule
3. Executive authority
4. Other _____ [**DecisionStructure_other_text**]

19. Please indicate either yes or no for each of the following statements concerning travel to ICC workshops and events.

	Yes	No
I have internal financial support to fund to travel to ICC events [FinancialSupport]	1	2
I would need a travel grant to be able to attend an ICC event [NeedTravelGrant]	1	2
I will not be able to travel to attend ICC events in person regardless of finances [NotAttend]	1	2

20. After the first ICC workshop, what is your preference for future meetings? [**MeetingPreference**]

1. In-person
2. Online
3. A mix of in-person and online
4. Other _____ [**MeetingPreference_other_text**]

21. Are there groups or individuals that you work with on invasive crayfish issues that would be a valuable part of the ICC? [**OtherPeople**]

1. Yes _____ (Name and contact info) [**OtherPeople_text**]
2. No

22. The initial grant funding the creation of the ICC concludes in September 2019. After this point in time, what is your preference for the continuation of the collaborative? **[AfterGrant]**

- A. Create a fee-based membership, and pay a facilitator from dues
- B. Pursue additional external grants
- C. Create a volunteer-led organization
- D. Transition to a working group consisting of agency personnel
- E. Other _____ **[AfterGrant_other_text]**

23. A potential exists for the development of a citizen science crayfish monitoring program. Please indicate your agreement with the following statement with respect to a program of that nature.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree, nor disagree	Somewhat agree	Agree	Strongly agree
A citizen science monitoring program for invasive crayfish will produce valuable scientific data [CitSciData]	1	2	3	4	5	6	7
Developing a citizen science monitoring program for invasive crayfish is worth the effort [CitSciEffort]	1	2	3	4	5	6	7
Citizens can play an important role in monitoring invasive crayfish [CitSciRole]	1	2	3	4	5	6	7

Appendix B. Raw responses and coded text for open ended questions.

1. Each bullet point is a single respondent.
2. Text that is not coded was determined to either fall outside the scope of the question, or lacked sufficient context to determine meaning.
3. Colors do not carry over from question to question. Numbered themes in the right hand column are summaries derived from the raw responses in the left hand column. Texts of matching colors (left and right) were determined to represent the same theme.
4. “KNOWLEDGE GAPS” was not coded because the content was determined to overlap with research needs.
5. “GOVERNANCE” preferences were not coded, most all respondents indicated preference for some form of executive structure (e.g., elected president/vice) with committees.

Raw Responses – “What do you feel are the most pressing RESEARCH needs surrounding invasive crayfish in the Great Lakes region?”	Emergent Themes – Color Coded
<ul style="list-style-type: none"> • Introduction and establishment potential and environmental risk assessments. • How they are impacting the ecosystem and other crayfish species? What habitats may be at risk habitats? Will climate change impact the effect of invasives? • Honestly, there is so little known about basic crayfish biology relative to some of the other invasive taxa we deal with, that I would consider that a research priority. • Diversity of CF in bait industry. 2. Current distribution of native and invasive species. 3. Age, temperature, and density effects on diets. • These apply to North America in general. 1. Better understand pathways of introduction. 2. Quantitatively compare control/eradication methods for early response and for established populations. • Understanding the effects of invasive crayfish on native crayfish, macroinvertebrates, and fish in streams, ponds and lakes • Ecological impacts to native crayfish • Effective detection and prevention methods. Documentation of risk and impacts. • Basic biology (especially characteristics that allow crayfish to invade), control • 1. Methods to eliminate or control populations of invasive crayfish with minimal effects on non-target species. 2. Outreach efforts that succinctly convey the message to the masses and to those with the power to institute regulatory change. • What species are present? Where are they present/absent? What is their effect on aquatic communities? What methods might be effective in reducing their populations? • Identify range expansion pathways 2. Risk assessments for Great Lakes and nearby watersheds 3. Development of fact sheets and guides 	<ol style="list-style-type: none"> 1. Basic biology of native and invasive crayfish species. Including life history and environmental conditions that influence distribution, and species’ potential for invasion or vulnerability to invasion (native), including projected effects of climate change. 2. Accurate distribution maps of currently occupied range of native and invasive crayfish by species. 3. A better understanding of the effectiveness of various methods for the control of invasive crayfish, their costs, and impacts on non-target and native crayfish species/aquatic systems. As well as methods for detection of invasive crayfish. 4. The impacts of invasive crayfish on aquatic ecosystems and native crayfish. 5. Identification of pathways for the introduction and spread of invasive crayfish including, diversity of species in use in bait and pet industries (and others), their supply chains, and end uses of invasive crayfish among the public. 6. Risk assessment of the potential for established invasive crayfish populations to expand into new habitats, and their locations. The potential for known, but not yet established, species to become invasive.

to identification for the general public

4. Discussion and development of mitigation and management strategies. what has worked and where

5. Competition and displacement of native species

- accurate distribution maps
- Research on effective control actions and social science that builds networks to work with stakeholders to ensure crayfish introductions are prevented through the OIT pathway (e.g., biological supply).
- We need to better understand the pathways of nonindigenous crayfish and the overwintering biology/ecology of species from warmer ranges.
- distribution of invasive crayfish in the region management options for invasive crayfish in streams also inhabited by native crayfish
- Cost effective control measures.
- - Potential for arrival of new species from various vectors
 - Potential for spread of new and existing species
 - How state and federal efforts, including outreach, can better control future arrival and spread of invasive crayfish
 - Impacts of invasive crayfish. Apart from rusty crayfish in some habitats we know very little about the impacts of crayfish in the Great Lakes region
 - Diversity of crayfish in different habitats, including the Great Lakes proper, where crayfish are rarely sampled for.
- My biggest concern at this time is the newly emerging Marmokrebs (Marbled Crayfish) species and its invasion risk to Illinois, and adopting regulations to help head-off a potential invasion. Research on invasion risks of this species and potential adverse impacts to the Great Lakes would be helpful. Also, Australian Redclaw are popular in the aquaculture industry and research on invasion risk to help inform regulators could be helpful. Any updates on Rusty Crayfish populations and

evaluating the effectiveness, or necessity, of regulations could be helpful.

- Improved understanding of the distribution and impacts of these species.
- tolerances for Ca, pH, etc to help predict invasiveness in other regions
- Better understanding of pathways - who is currently using invasive crayfish and for what purposes.
- Awareness, education, identifying pathways, technologies for control, biology/life history of invader populations (and native populations!),
- How to control the population and limit dispersal.
- Are there threshold limitations? What are suitable habitats and what are preferred habitats - to help early detection monitoring. What are pathways and how far will pathway disperse to suitable/preferred habitats? What are best control options that also have limited non-target impacts?

<p>“What do you feel are the most pressing OUTREACH NEEDS for CITIZENS (e.g., anglers, pet owners, retailers), MANAGERS, and POLICY MAKERS with respect to invasive crayfish?”</p>	<p>Emergent Themes – Color Coded</p>
<ul style="list-style-type: none"> • Public education on responsible pet ownership/bait management, stopping their spread, and perhaps identification tools for citizen science reporting. • Knowledge of the damage invasive crayfish cause. Ways to dispose of unwanted animals. Alternatives to using invasive crayfish. • Emphasizing prevention (not releasing crayfish into the wild, not allowing import) because invasive crayfish have so many potential impacts and can be so difficult to control. • For retailers, identification skills. 2. For policymakers, up-to-date synthesis of documented impacts (ecological, economic, health risk...anything that makes sense for their jurisdiction). 3. For managers, surveillance, identification, and control options. • Policy Makers: That sale and transport of live crayfish should be PROHIBITED in all locations, possibly with exception of a few food species that are already widely introduced. Citizens: Don't move them between places and don't release your pets or classroom crayfish. Managers: 1) That you really need a better understanding of how they are getting introduced, and 2) without some routine monitoring, you aren't going to know when you have an introduction. • Education on the effects and how to limit the spread of the invasive species. • Identification and how to slow spread • Understand invasion impacts. Practical approaches to prevention. Guidance for reporting. • Multilingual educational materials. Meeting people where they are so that they don't have to take initiative to seek out information. 	<ol style="list-style-type: none"> 1. Establish protocols for the rigorous evaluation of current (and future) outreach campaigns with respect to their relative abilities to change stakeholders' knowledge, attitudes, behaviors related to invasive crayfish spread, mitigation, use and management. 2. Develop educational materials that convey to stakeholders appropriate methods for the safe handling and/or disposal of unwanted pet and/or bait in order to prevent further introductions of invasive crayfish. Identification of a code of responsible behavior for the possession, care, and disposal of invasive crayfish to inform outreach campaigns. 3. Develop educational materials that convey to stakeholders 1) the diversity of native and invasive crayfish present in the Great Lakes Region, 2) how to identify different species, 3) the ecological and economic impacts of invasive crayfish in aquatic ecosystems, 4) options for reporting observed invasive crayfish to early detection programs. 4. Make new and existing educational materials accessible to diverse stakeholders with respect to language (e.g., Spanish language versions), academic content (e.g., understandable for lay audience), and availability (e.g., social media, print). 5. Targeted outreach to biological supply companies and pet traders marketing live crayfish. Determining prevalence of the practice of selling invasive crayfish (research, especially on emerging new species e.g., Marmokebs), and strengthen partnerships with pet/bait industry. 6. Guidelines for the establishment of new, and enforcement of existing, non-release laws surrounding invasive crayfish (e.g., Wisconsin NR40), targeted outreach to convey the difficulties of managing invasive crayfish to decision makers.

<ul style="list-style-type: none"> • Relaying the impact that invasive crayfish can have • I believe that, although more people are certainly aware of the issues and challenges regarding crayfish invasions than ever before, many more need to be educated. The challenge is to educate and provide the necessary information to those in contact with invasive crayfish without overwhelming them with unnecessary, difficult to understand scientific material. • What it looks like and why its a problem: fact sheets and guides to identification <ol style="list-style-type: none"> 2. Information on how to minimize introductions, and what to do if you find one 3. Information on how to find native species to retail rather than invasive ones 3. Consensus on best management and mitigation strategies 4. Quantifiable data on success rates of management and mitigation strategies 5. Quantifiable data on ecosystem effects of crayfish establishment • Awareness about which crayfish are native vs invasive. Also that people should not move crayfish as bait from one water body to another. • Outreach to those involved with the OIT pathway Also informing the public on how to report detections for early detection programs • More education is needed so that people appreciate the problem and are able to identify potential introductions. • information on not releasing pets into the environment information on collecting crayfish as bait and not releasing crayfish used as bait into the environment identification of invasive crayfish species • How complicated it is to control an invasive population once established. • '- Outreach programs need to be more rigorously evaluated. I would like to see outreach practitioners funded to team up with social scientists for some before and after evaluations of behavior. 	<ol style="list-style-type: none"> 7. Mechanisms for the engagement of trained citizen scientists in invasive crayfish identification and reporting. 8. Compile information for managers regarding the state of knowledge surrounding best practices for invasive crayfish control and monitoring and their relative efficacy.
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- How can outreach programs access the crayfish users who have so far not heeded their message?

- We should evaluate how wide spread the market is for Marmokebs and invasion vectors, and risk, to the Great Lakes. They are popular in the pet trade and retail outlets, but we don't know how widespread they are in the pet trade in the Great Lakes they are. This will help to inform and plan outreach needs.
- Do not release messages. Engagement of (trained) citizen scientists in reporting. Importance of support (regulation, funding, etc) for research and control.
- Biological supply companies still sell live crayfish; pet retailers still sell pet crayfish - outreach needed here!
Letting people know how to humanely kill their pets (rather than release them) might be helpful.
- What behaviors do we want these people to take? Don't import invasive crayfish, and don't release any crayfish into the environment.
- Many, many species of crayfish, ecological impacts of invader crayfish, biosecurity protocols may be seen more favorably than regulation, economics and impacts of infestations
- People enjoy natural resources and usually take some pride in their own state's resources. I think if they see the impact of what these invasive crayfish are doing to the native population they will have a sense of accountability. Also, there is the cost associated with the decline in our resources the drop in revenue the allocation of funds to manage these issues its taxpayer dollars.
- In WI, an NR 40 permit is required to possess species identified in NR40. It is illegal to release plants or animals (Don't free Willy!). We need policy makers to enforce NR40.

“What do you perceive to be the biggest KNOWLEDGE GAPS with respect to invasive crayfish relevant to your role in your organization?”	Emergent Themes – Color Coded
<ul style="list-style-type: none"> • Up to date mapping data, as well as more fine-tuned risk assessments on potential for introduction and establishment in the Great Lakes region. • I think the knowledge gaps are more with the life histories and ranges of native species. Without understanding all of the natives it is hard to assess the impact of invasive crayfish to native species and their habitats. • Basic biology, impacts • I'm constantly struck by an underappreciation of the variety of crayfish by laypersons, retailers, and even lake managers • Accurate assessment of native ranges so we can even know quickly what is invasive and what isn't. 2. Taxonomic clarity. • Understanding the microhabitat usage and behavior interactions among crayfish. • What is the current geographic distribution in northern IN • I do not have an up to date range map for rusty crayfish for NE Illinois. I don't know whether they are present in any of the Lake Michigan watershed waterways, or which ones. This information may exist, but this issue hadn't been on my radar. • Reproductive biology, movement • Control methods - what works what does not work. It is possible that multiple management actions might be needed (e.g., manual removal in conjunction with increased fish predation) to eliminate/control invasive crayfish but these types of strategies have not been well-studied. • Where they are found in the St. Lawrence Basin How fast they spread and what the potential expansion pathways are How best to manage populations of currently established species 	

- No one can accurately identify crayfish
- Effective control strategies and the overall impacts of invasions.
- I am developing a risk assessment for crayfish in the Great Lakes. For these risk assessments, we really need information on failed introductions. Also, more information on species traits and native ranges is needed.
- distribution of invasive crayfish
how much use is there of crayfish as bait and pets in the region
- Control options.
- '- How they are being spread from place to place. We have have a lot of anecdotal information, but it would be great to know more. This could inform outreach efforts.
 - To what extent can we control populations of invasive crayfishes? Is it worthwhile to control them at this level?
 - What are the impacts of invasive crayfish in the Great Lakes region and Great Lakes proper?
- The pet trade, and internet purchase markets for invasive and invasive crayfish at risk of invading. Including research supply companies for school biology classes, and hobby aquaculturists.
- We need improved distribution maps, including historic distributions.
- We are still struggling with a better understanding of distribution, and really what is native and what is not (although this last bit is somewhat unimportant at this point).
- How to effectively reach people who might be using invasive crayfish for various purposes (food, pets, classroom, etc.).
- why crayfish are critically important to ecosystems; economics and impacts of infestations
- I think its the difference between what you want and what you can get. Research sometimes is impractical at a wide scale developmental level. If you need to reach stake holders or the public it needs to be something that can yield results at a cost that is justified by the outcome. I guess

<p>trying to find the balance between the research that has already been done with the BMPs to date and information sharing/outreach</p> <ul style="list-style-type: none">• Are traps the best monitoring tools? Is eDNA an option?	
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“What do you feel are the MOST IMPORTANT GOALS the ICC should strive to achieve during the next 18 MONTHS? ”	Emergent Themes – Color Coded
<ul style="list-style-type: none"> • Creating a list of resources for ICC members to cross-reference and share. • Identify best management practices to prevent spread of invasive crayfish. outreach to anglers, pet shops, etc. • Building a community that fosters collaborative efforts and communication between researchers and management agencies • up-to-date distributional records up-to-date taxonomic experts by state/region • Public information. Lobbying for stricter controls on sale and transport of live crayfish. • Organization, list of members that includes areas of expertise and willingness to help others as well as contact information. • characterization of the problem: ecological impact and geographic distribution • Networking. Sharing knowledge and capacity, identify gaps. • -Identify and bring in any missing partners, -Getting all team members up to speed on the status of invasive crayfish in the region, -Getting all team members up to speed on current science on control methodologies and educational needs, - Identification of priority hot spots and priority audiences, -Coming up with a control model and educational model that maximizes collaboration • Identifying knowledge gaps • Based on the best available science do the following: <ol style="list-style-type: none"> 1. Establish a consensus on how to manage and regulate invasive crayfish in the Great Lakes region. 2. Establish a consensus on how to effectively reach and positively impact individuals with the potential to impact the spread of invasive crayfish in the Great Lakes region. • Identification of priority species Round table discussion of current and 	<ol style="list-style-type: none"> 1. Create code of best management practices for various stakeholders with respect to invasive crayfish control, monitoring, handling, and prevention and outreach. 2. Generate accurate current and/or historical distribution maps of native and invasive crayfish species. 3. Develop a network of individuals working in the areas of crayfish biology, management, extension, and business, including a framework for the sharing of resources among members and agencies. Ensure network members are up to date on best science, and agree on the scope of the problem surrounding invasive crayfish, including targeted measures for addressing it. Identify knowledge gaps. 4. Development of an outreach model that will 1) increase the level of public awareness surrounding invasive crayfish, 2) leverage partnerships with industry to reduce the risk of future invasions from pet/bait sources.

<p>potential management and mitigation strategies</p> <p>Overview of presence/absence of priority species in the Great Lakes and adjacent ecosystems</p> <ul style="list-style-type: none"> • Provide information on effective controls. Build networks with OIT pathway to reduce risk of future introductions. • I think that we need to promote education/awareness and identify research/data gaps. • get states working together to identify threats, research needs, and management of invasive crayfish in the region • Provide venue for collaboration • '- Bringing together stakeholders to share experiences and expertise, and to develop a cohesive group that is focused on this problem. <ul style="list-style-type: none"> - Agreement across stakeholders about the scope and scale of the invasive crayfish problem. - Information sharing about how the problem has been managed in different areas, and what the results have been. • Create the baseline of information - historic and current distributions, known impacts, control toolbox, etc. - and definition of a regional/national strategy (priorities) for addressing these species. • outreach to pet dealers & biological suppliers; bait dealers, and state fish and wildlife agencies. • promotion of collaboration and information exchange • Collaboration of many different entities which is what is in the works, and information sharing between entities. Also, public awareness • providing guidance on id to increase detections, while reducing false detections work with collaborative to assess broader needs (does everyone already know how to monitor and control?) 	
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“What do you feel are the MOST IMPORTANT LONG-TERM GOALS for the ICC?”	Emergent Themes – Color Coded
<ul style="list-style-type: none"> • Creating a list of resources for ICC members to cross-reference and share. • Identify knowledge gaps and provide funding to researchers to fill knowledge gaps. Getting citizens involved (ex. citizen science) so that awareness and reduction of spread is a collective effort. Reduce spread of invasive crayfish in this region. Work with policy makers to set better regulations to crayfish collecting and movement across the US. • retailer education programs • Understanding pathways of introduction. Understanding why some introductions lead to establishment and others don't. • Monitoring of invasive and development of plans to reduce or limit populations • education: identification, limit spread • -If control activities are feasible, establishing an MOU between landowners to pool resources through a strike-team model, -Set measurable and achievable education and outreach outcomes and create a plan to get there in a collaborative manner, -Create an implement a plan to monitor effectiveness, -To the degree possible, secure stable funding, • Communication with managers and policy makers • Establish priorities for invasive crayfish research and a means to fund projects addressing those priorities. • Develop a up-to-date map of known established populations of identified priority species Develop an invasive species crayfish database to provide general public and other researchers with basic information Identification of expansion pathways, including a climate change component. Risk assessments for the Great Lakes and adjacent systems Develop fact sheets and/or online resources for the general public 	<ol style="list-style-type: none"> 1. Identify knowledge gaps and priorities for research with respect to invasive crayfish, and establish funding mechanism for collaborators to conduct associated research. 2. Develop interactive and updatable GIS database that contains distribution information for native and invasive crayfish species. 3. Partner with policy makers to develop appropriate, regionally coordinated, regulations surrounding invasive crayfish. 4. Develop comprehensive online resource for the storage, collection, and dissemination of invasive crayfish related information including species distributions, mechanisms for control, methods for monitoring, identification, research reports, risk assessments, prevention, and outreach, and means for information exchange between researchers and the public. 5. Establish citizen science monitoring program. Mechanism for public engagement in research and monitoring. 6. Develop comprehensive understanding of pathways for introduction. 7. Develop measureable and achievable targets for public outreach, education and engagement. Including ICC collaboration with decision makers/managers retailers, and retailer education. 8. Develop coordinated plan for the monitoring and management of invasive crayfish. Reduce and or eliminate targeted populations where/if feasible. 9. Develop mechanisms for the prevention of new introductions of invasive crayfish.

- Prioritize issue to ensure funding is available to address prevention and control of invasive crayfish in the Great Lakes basin.
- Fund a sustainable education/awareness and research program.
- help eliminate current populations, the spread, and the use of invasive crayfish in the region
- consistent state laws regarding invasive crayfish
- Effective prevention options to prevent establishment.
- '- Have stakeholders agree on what level of priority invasive crayfish should be when considered against their other priorities.
 - Coordinated policy and action across states and provinces.
 - A map that can be readily updated showing the known distribution of invasive and native crayfishes across the Great Lakes Basin.
- Prevention of introduction, minimization of spread and impact of invasive crayfish
- networking researchers with agencies tasked with control.
- Coordinate prevention across Great Lakes
- platform for information exchange, education and outreach
- Presence in the public, actively being a part of stakeholder meetings, publicly representing the research field and working with land management agencies and providing evidence for continued funding/support to policy makers.
- Consistency in strategies and communication

<p>“What criteria(s) (e.g., cost, effectiveness, specificity) should the ICC consider when DEVELOPING potential BEST MANAGEMENT PRACTICES for invasive crayfish control?”</p>	<p>Emergent Themes – Color coded</p>
<ul style="list-style-type: none"> • Efficacy, cost, regional relevance. • Effectiveness Cost • Cost-benefit payoff and specificity would be my top criteria • effectiveness, cost, target specificity, longevity of control • I think we need better information on control effectiveness in various habitats before we can establish BMPs. • balance of cost and effectiveness • Practical for users. Make prevention and reporting as easy as possible. • Effectiveness Cost Applicability to different systems • 1.spatial scale of effectiveness - is the management practice useful across systems? 2.effort required (time and money) • If the ICC is going to be a tactical group (developing BMPs is tactical) It's not for me. • Specificity Effectiveness Ease of practice • cost effectiveness and impacts/risks of BMPs to native species. • I think that natural resource managers should come up with the best criteria. • all options should be considered • - Cost - Effectiveness (ideally with peer-reviewed science) - Public willingness to accept any trade-offs associated with BMPs - Potential to alter long-term trajectory of an invasion • Effectiveness • No one plan will work for infestations, so all criteria should be considered. Managers will need to be the ones to develop criteria applicable to their 	<ol style="list-style-type: none"> 1. Cost (financial and/or labor/ease of implementation) 2. Efficacy, including longevity. 3. Specificity to target species, limited impacts on native species. 4. Scale of geographic relevance (e.g., practice works in multiple systems). 5. Public acceptability of practice.

situations. Everything should be considered!

- That's hard you want small scale to try to rule out other factors but not so small that it is not adaptable to the whole system and yes research costs money...so yes, cost and effectiveness are always at the top of most lists.
- Include comprehensive components: policies, identify species, outreach, early detection monitoring, population densities, identify control options with limited non-target impacts, evaluate control efficacy and non-target impacts, identify research needs

<p>“What TOOLS FOR MANAGEMENT (e.g., monitoring protocols, rapid response plans) can the ICC help to produce that will improve the ability to control invasive crayfish?”</p>	<p>Emergent Themes – Color Coded</p>
<ul style="list-style-type: none"> • Rapid response plans, monitoring protocols. • monitoring protocols Some type of guide for the identification of invasive crayfish for the public. • Not management in a narrow sense, but: outreach materials for aquarium hobbyists, pet shops, and biology teachers to educate about crayfish species and risks of introduction • monitoring protocols, updated and interactive maps of crayfish • education • Citizen monitoring protocols. Outreach materials. • Monitoring protocols Information sharing • An invasive crayfish management document for the Great Lakes region. The document would include the above mentioned topics as well as others. • Standardized monitoring protocols Standardized trapping methods Rapid response plans • rapid response plans • Monitoring and rapid response tools would be very helpful. • I think that environmental DNA monitoring protocols, deployed over the whole region and with results shared quickly and widely, would be one of the most cost-effective management tools that we could come up with. • - Monitoring protocols would be great for standardizing the results being generated. - Rapid response plans may be useful, but it would depend upon identifying a way to control/eradicate crayfish. The only other currently available alternative is to close a waterway to the vectors that could move crayfish. - Prepared publicity materials. If a state decides to act in a certain way, it would be useful if they already had materials about the species in question, and/or the 	<ol style="list-style-type: none"> 1. Identification guide, outreach materials for the public, interactive distribution maps. 2. Coordinated, standardized, rapid response plan to implement in the case of invasion. Including publicity materials for managers to justify action. 3. Coordinated and standardized, monitoring protocol. Including option for citizen engagement. Environmental DNA monitoring tools. 4. A comprehensive invasive crayfish management plan/document.

<p>proposed management, that they could readily use to justify their actions</p> <ul style="list-style-type: none">• Both the two you suggest as examples (monitoring protocols, rapid response plans). Elements within those might include a 'decision-tree' for determining action on particular situations, a 'toolbox' of management options, case studies indicating which methods work (and don't) for particular situations.• Monitoring, Rapid Response Plans. Modelling tools for potential for invasiveness, education/outreach documents, summaries of regulations for sale of crayfish, summaries of biosecurity protocols, warehousing information	
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Are there any immediate POLICY NEEDS surrounding invasive crayfish management that the ICC can help develop?	Emergent Themes – Color Coded
<ul style="list-style-type: none"> • Permits to collect crayfish (maybe put a number on it) Regulation of type of crayfish distributed by bait shops. • Encouraging states to implement rules limiting import of known invasive crayfish species • Ban import, export, sale and transport of live crayfish! At this point, the pet trade for crayfish is still small potatoes, so now is the time to limit it. Some states have already taken on the bait trade--let's work on the other states. • Continue to support the limits on culturing and possession of invasive species. • Enforcement of existing policy • You can buy a fishing license online in IL without seeing a link to the Fishing Guide or checking a box to say that you read the Fishing Guide. I'd like to have best practices at an agency level that address education to fishermen about not releasing live bait. I would also like a review of best practices to educate IDNR site staff and law enforcement staff about invasive crayfish. • Standardized crayfish regulations across states as has been called for by others • Guidance on the new marbled crayfish - can we add it to the prohibited list of species immediately? • Differences in state regulations for various crayfish species. • determine if there are gaps or inconsistencies in state laws and how to improve • Listing of high risk species as injurious • '- A unified list of the species that pose a risk to the Great Lakes over the foreseeable future. • - Details of existing policies and how effective they have been. • Prevention, outreach to people who use invasive crayfish 	<ol style="list-style-type: none"> 1. Recommendations/support for regulations surrounding the possession, sale, collection, importation, exportation of live invasive crayfish. Update existing regulations to include emerging species of concern. 2. Encourage enforcement where current regulations exist. 3. Generate mechanism for educating anglers at the point of sale regarding invasive crayfish, and associated regulation. 4. Standardization of regulations across region and by species. 5. Conduct gap analysis of existing regulations surrounding invasive crayfish by state. Identify areas for improvement/standardization/adaptation. Comparison of the efficacy of existing regulations.

<ul style="list-style-type: none">• Registration of chemicals for control of crayfish; regulations for potential pathways for invasive crayfish; support for general environmental laws• Wisconsin has a fairly robust invasive species rule. What can other states do? Can there be stronger federal regulation?	
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What RESOURCES would you like to see available through the ICC WEBSITE ?	
<ul style="list-style-type: none"> • Links to GLANSIS species profiles and other resources already available online! • Invasive species identification guide Best management practices Crayfish disposal protocol • Research abstracts are a great idea; links to labs doing research on invasive crayfish; links to state or local regulations on crayfish possession, transport, and/or release • best management practices local expert database • List of members with expertise and contact information. • identification, map of geographic distribution • Outcomes from discussions. Links to existing resources. • For ICC members, I'd like agendas and meeting notes to go on the website. I think that there should also be a link for potential partners to inquire about joining. Outward facing resources should be updated as we make progress as a partnership. • List of experts pdfs of relevant publicatoinis • Literature, policy documents, invasive crayfish distribution maps • Connectivity to those researching and managing invasive crayfish is critical. Anything that assists connectivity is useful. • List and contact details of experts and interested parties Map of presence/absence of established populations by species Accessibility of current monitoring and mitigation protocols currently in use by others Accessibility of fact sheets and guides for general public • best management practices and sampling design documents • Lists of native/nonindigenous species, nonindigenous crayfish management tools, etc. would be good. It'd be great to 	<ol style="list-style-type: none"> 1. Links to species profiles (e.g., GLANSIS) and other already available materials online. Including state and federal regulations, research labs websites/profiles. 2. Materials on crayfish identification and distribution. Fact-sheets for public. 3. List of members/experts, profiles containing contact info, areas of expertise, geographic location. Mechanism for interactions among members (e.g., discussion board, listserv). Options for public inquiries and new members to join. 4. Clearinghouse of invasive crayfish research. Research abstracts, links to publications, reports. 5. ICC goals, mission etc. Agendas from meetings, summaries of discussions. Upcoming meetings. 6. Management toolbox, case studies on effective control. Control options. Best management practices guidelines.

<p>have a big clearinghouse for all of this information.</p> <ul style="list-style-type: none"> • publications, webinars • Case studies for effective control • - Species fact-sheets that detail risky species, their distributions, and potential impacts. <ul style="list-style-type: none"> - List of people actively working on invasive crayfish issues in the Great Lakes Basin. - Bibliography of invasive crayfish papers from the Great Lakes region. • Detailed management information, discussion forum, public fact sheets, Would prefer that the system cross-link to GLANSIS and/or USGS NAS (we would love to partner in expanding our information) for confirmed distribution maps, peer-reviewed and grey literature, and risk assessments - to avoid duplication of effort. • Not sure what these kinds of websites do, since I don't commonly and frequently visit specific websites, but things like upcoming meetings, events, etc related to invasive crayfish; help with reviews of manuscripts, policies, etc; new publication, new policy and laws • I think we are sharing resources and information that is good for me. It would be nice to have a web interface where peoples comments and information is posted. • A website with information on the goals that the collaborative decides on (outreach, monitoring, control, policy). Also serve as a clearinghouse for related information. 	
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<p>It is intended that the ICC will operate through some form of self-governance. What organizational structure do you feel is the most appropriate?</p>	
<ul style="list-style-type: none"> • President, VP, chairs of groups (i.e, best management practices, policy, outreach, etc) • Director with an elected board. • Co-chairs, a committee of the whole and subcommittees • Representation from different types of groups (agency (I think tribal representation is especially important), NGO, academia) • executive branch - president, vice president, etc.; committees, sub-committees • Something similar to GL Panel on Aquatic Nuisance Species • I think that elected positions (e.g. President, Secretary, VP Management, VP Research) would be the most effective. Regular, agenda-driven meetings have been the most productive in my experience. • representatives from each state with one overall coordinator/chair • Look at other successful collaborations • '- Ideally we will work together enough and come to trust each other so that consensus is the best way forward. This requires a lot of trust among members, and a willingness to compromise. At the end of the day, though, majority rule is probably required. - Some sort of leader will probably be needed to ensure that stuff actually happens. Ideally this would be a position the rotates among members. • No opinion, but prefer less formal structure • Board and also, outside opinion but the members should have a say before a final decision is made. • I like how the invasive mussel collaborative functioned. GLC facilitated meetings, kept notes and developed tasks. They compiled the information. I 	

appreciated that it wasn't too much work on my end beyond meetings.	
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Appendix C. Ranking and rating questions from second round survey. [variable name in data]

1a. Please rank the following **RESEARCH NEEDS** associated with invasive crayfish that emerged from ICC members' responses to the first-round survey where 1 = highest priority, and 6 = lowest priority for research.

The ICC should..

_____...develop a better understanding of the basic biology of native and non-native crayfish species, including life history and environmental conditions that influence distribution, and species' potential for (non-native) or vulnerability to (native) invasion, including projected effects of climate change.

[Research1_rank]

_____...develop accurate distribution maps of currently occupied range of native and non-native crayfish by species. **[Research2_rank]**

_____...develop a better understanding of the effectiveness of various methods for the control of non-native crayfish, their costs, and impacts on non-target and native crayfish species, as well as methods for detection. **[Research3_rank]**

_____...develop a better understanding of the impacts of non-native crayfish on aquatic ecosystems and native crayfish. **[Research4_rank]**

_____...work to identify pathways for the introduction and spread of non-native crayfish including, the diversity of species in use in bait and pet industries (and others), their supply chains, and end uses among the public. **[Research5_rank]**

_____...conduct a risk assessment of the potential for established non-native crayfish populations to expand into new habitats and identify those locations, as well as the potential for known, but not yet established, species to become invasive. **[Research6_rank]**

1b. How important are each of the following **RESEARCH NEEDS** associated with invasive crayfish where 0 = not at all important, and 100 = extremely important for research?

How important is it that the ICC...

...develop a better understanding of the basic biology of native and non-native crayfish species, including life history and environmental conditions that influence distribution, and species' potential for (non-native) or vulnerability to (native) invasion, including projected effects of climate change.

[Research1_rate]

0-100 _____

...develop accurate distribution maps of currently occupied range of native and non-native crayfish by species. **[Research2_rate]**

0-100 _____

...develop a better understanding of the effectiveness of various methods for the control of non-native crayfish, their costs, and impacts on non-target and native crayfish species, as well as methods for detection. **[Research3_rate]**

0-100 _____

...develop a better understanding of the impacts of non-native crayfish on aquatic ecosystems and native crayfish. **[Research4_rate]**

0-100 _____

...work to identify pathways for the introduction and spread of non-native crayfish including, the diversity of species in use in bait and pet industries (and others), their supply chains, and end uses among the public. **[Research5_rate]**

0-100 _____

...conduct a risk assessment of the potential for established non-native crayfish populations to expand into new habitats and identify those locations, as well as the potential for known, but not yet established, species to become invasive. **[Research6_rate]**

0-100 _____

2a. Please rank the following **OUTREACH NEEDS** associated with invasive crayfish that emerged from ICC members' responses to the first-round survey where 1 = highest priority, and 8 = lowest priority for research.

The ICC should...

_____...establish protocols for the rigorous evaluation of current and future outreach campaigns with respect to their relative abilities to change stakeholder' knowledge, attitudes, and behaviors related to non-native crayfish spread, mitigation and management. [**Outreach1_rank**]

_____...develop educational materials that convey to stakeholders appropriate methods for the safe handling and/or disposal of unwanted pet and/or bait in order to prevent further introductions of non-native crayfish, including a code of responsible behavior for the possession, care, and disposal of non-native crayfish to inform outreach campaigns. [**Outreach2_rank**]

_____...develop educational materials that convey to stakeholders the diversity of native and non-native crayfish present in the Great Lakes region, how to identify different species, the ecological and economic impacts of non-native crayfish in aquatic ecosystems, and options for reporting observed non-native crayfish to early detection programs. [**Outreach3_rank**]

_____...ensure that new and existing educational materials are accessible to diverse stakeholders with respect to language (e.g., Spanish language versions), academic content (e.g., understandable for lay audience), and availability (e.g., social media, print). [**Outreach4_rank**]

_____...conduct targeted outreach to biological supply companies and pet traders marketing live crayfish in order to determine the prevalence of the practice of selling non-native crayfish (especially emerging species e.g., Marmokebs), and strengthen partnerships with industry. [**Outreach5_rank**]

_____...work to establish guidelines for new regulations, and enforcement of existing regulations, surrounding non-native crayfish (e.g., Wisconsin NR40), and conduct targeted outreach to convey the difficulties of managing non-native crayfish to decision makers. [**Outreach6_rank**]

_____...develop mechanisms for the engagement of trained citizen scientists in non-native crayfish identification and reporting. [**Outreach7_rank**]

_____...compile information for managers regarding the state of knowledge surrounding best practices for non-native crayfish control and monitoring and their relative efficacy. [**Outreach8_rank**]

2b. How important are each of the following **OUTREACH NEEDS** associated with invasive crayfish where 0 = not at all important, and 100 = extremely important?

How important is it that the ICC...

...establish protocols for the rigorous evaluation of current and future outreach campaigns with respect to their relative abilities to change stakeholder' knowledge, attitudes, and behaviors related to non-native crayfish spread, mitigation and management. [**Outreach1_rate**]

0-100 _____

...develop educational materials that convey to stakeholders appropriate methods for the safe handling and/or disposal of unwanted pet and/or bait in order to prevent further introductions of non-native crayfish, including a code of responsible behavior for the possession, care, and disposal of non-native crayfish to inform outreach campaigns. [**Outreach2_rate**]

0-100 _____

...develop educational materials that convey to stakeholders the diversity of native and non-native crayfish present in the Great Lakes region, how to identify different species, the ecological and economic impacts of non-native crayfish in aquatic ecosystems, and options for reporting observed non-native crayfish to early detection programs. [**Outreach3_rate**]

0-100 _____

...ensure that new and existing educational materials are accessible to diverse stakeholders with respect to language (e.g., Spanish language versions), academic content (e.g., understandable for lay audience), and availability (e.g., social media, print). [**Outreach4_rate**]

0-100 _____

...conduct targeted outreach to biological supply companies and pet traders marketing live crayfish in order to determine the prevalence of the practice of selling non-native crayfish (especially emerging species e.g., Marmokebs), and strengthen partnerships with industry. [**Outreach5_rate**]

...work to establish guidelines for new regulations, and enforcement of existing regulations, surrounding non-native crayfish (e.g., Wisconsin NR40), and conduct targeted outreach to convey the difficulties of managing non-native crayfish to decision makers. [**Outreach6_rate**]

0-100 _____

...develop mechanisms for the engagement of trained citizen scientists in non-native crayfish identification and reporting. [**Outreach7_rate**]

0-100 _____

...compile information for managers regarding the state of knowledge surrounding best practices for non-native crayfish control and monitoring and their relative efficacy. [**Outreach8_rate**]

0-100 _____

3a. Please rank the following **GOALS FOR THE ICC OVER NEXT 18 MONTHS** that emerged from ICC members' responses to the first round survey where 1 = highest priority, and 4 = lowest priority.

The ICC should...

_____ ...create code of best management practices for various stakeholders with respect to invasive crayfish control, monitoring, handling, and prevention and outreach. **[ShortGoals1_rank]**

_____ ...generate accurate current and/or historical distribution maps of native and invasive crayfish species. **[ShortGoals2_rank]**

_____ ...develop a network of individuals working in the areas of crayfish biology, management, extension, and business, including a framework for the sharing of resources among members and agencies. Ensure network members are up to date on best science, and agree on the scope of the problem surrounding invasive crayfish, including targeted measures for addressing it. Identify knowledge gaps. **[ShortGoals3_rank]**

_____ ...develop an outreach model that will increase the level of public awareness surrounding invasive crayfish, and leverage partnerships with industry to reduce the risk of future invasions from pet/bait sources. **[ShortGoals4_rank]**

3b. How important are each of the following **GOALS FOR THE ICC OVER NEXT 18 MONTHS** where 0 = not at all important, and 100 = extremely important.

How important is it that the ICC...

...create code of best management practices for various stakeholders with respect to invasive crayfish control, monitoring, handling, and prevention and outreach. **[ShortGoals1_rate]**

0-100 _____

...generate accurate current and/or historical distribution maps of native and invasive crayfish species. **[ShortGoals2_rate]**

0-100 _____

...develop a network of individuals working in the areas of crayfish biology, management, extension, and business, including a framework for the sharing of resources among members and agencies. Ensure network members are up to date on best science, and agree on the scope of the problem surrounding invasive crayfish, including targeted measures for addressing it. Identify knowledge gaps.

[ShortGoals3_rate]

0-100 _____

...develop an outreach model that will increase the level of public awareness surrounding invasive crayfish, and leverage partnerships with industry to reduce the risk of future invasions from pet/bait sources. **[ShortGoals4_rate]**

0-100 _____

4a. Please rank the following **LONG-TERM GOALS FOR THE ICC** that emerged from ICC members' responses to the first round survey where 1 = highest priority, and 9 = lowest priority for the ICC to address.

The ICC should..

_____...identify knowledge gaps and priorities for research with respect to invasive crayfish, and establish funding mechanism for collaborators to conduct associated research. **[LongGoals1_rank]**

_____...develop interactive and updatable GIS database that contains distribution information for native and invasive crayfish species. **[LongGoals2_rank]**

_____...partner with policy makers to develop appropriate, regionally coordinated, regulations surrounding invasive crayfish. **[LongGoals3_rank]**

_____...develop a comprehensive online resource for the storage, collection, and dissemination of invasive crayfish related information including species distributions, mechanisms for control, methods for monitoring, identification, research reports, risk assessments, prevention, and outreach, and means for information exchange between researchers and the public. **[LongGoals4_rank]**

_____...establish a citizen science monitoring program with mechanisms for public engagement in research and monitoring. **[LongGoals5_rank]**

_____...develop a comprehensive understanding of pathways for introduction. **[LongGoals6_rank]**

_____...develop measurable and achievable targets for public outreach, education and engagement, including ICC collaboration with decision makers/managers retailers, and retailer education. **[LongGoals7_rank]**

_____...develop a coordinated plan for the monitoring and management of invasive crayfish and reduce and or eliminate targeted populations where/if it is feasible. **[LongGoals8_rank]**

_____...develop mechanisms for the prevention of new introductions of invasive crayfish. **[LongGoals9_rank]**

4b. How important are each of the following **LONG-TERM GOALS FOR THE ICC** where 0 = not at all important, and 100 = extremely important.

How important is it that the ICC...

...identify knowledge gaps and priorities for research with respect to invasive crayfish, and establish funding mechanism for collaborators to conduct associated research. [**LongGoals1_rate**]

0-100 _____

...develop interactive and updatable GIS database that contains distribution information for native and invasive crayfish species. [**LongGoals2_rate**]

0-100 _____

...partner with policy makers to develop appropriate, regionally coordinated, regulations surrounding invasive crayfish. [**LongGoals3_rate**]

0-100 _____

...develop a comprehensive online resource for the storage, collection, and dissemination of invasive crayfish related information including species distributions, mechanisms for control, methods for monitoring, identification, research reports, risk assessments, prevention, and outreach, and means for information exchange between researchers and the public. [**LongGoals4_rate**]

0-100 _____

...establish a citizen science monitoring program with mechanisms for public engagement in research and monitoring. [**LongGoals5_rate**]

0-100 _____

...develop a comprehensive understanding of pathways for introduction. [**LongGoals6_rate**]

0-100 _____

...develop measurable and achievable targets for public outreach, education and engagement, including ICC collaboration with decision makers/managers retailers, and retailer education. [**LongGoals7_rate**]

0-100 _____

...develop a coordinated plan for the monitoring and management of invasive crayfish and reduce and or eliminate targeted populations where/if it is feasible. [**LongGoals8_rate**]

0-100 _____

...develop mechanisms for the prevention of new introductions of invasive crayfish. [**LongGoals9_rate**]

0-100 _____

5a. Please rank the following **CRITERIA FOR ESTABLISHING BEST MANAGEMENT PRACTICES** that emerged from ICC members' responses to the first round survey where 1 = highest priority, and 5 = lowest priority as criteria for establishing BMPs.

The ICC should consider...

_____...cost (financial and/or labor/ease of implementation). [BMPCriteria1_rank]

_____...efficacy, including longevity. [BMPCriteria2_rank]

_____...specificity to target species, limited impacts on native species. [BMPCriteria3_rank]

_____...scale of geographic relevance (e.g., practice works in multiple systems).
[BMPCriteria4_rank]

_____...the public acceptability of the practice. [BMPCriteria5_rank]

5b. How important are each of the following **CRITERIA FOR ESTABLISHING BEST MANAGEMENT PRACTICES** where 0 = not at all important, and 100 = extremely important.

How important is it that the ICC consider...

...cost (financial and/or labor/ease of implementation). **[BMPCriteria1_rate]**

0-100 _____

...efficacy, including longevity. **[BMPCriteria2_rate]**

0-100 _____

...specificity to target species, limited impacts on native species. **[BMPCriteria3_rate]**

0-100 _____

...scale of geographic relevance (e.g., practice works in multiple systems). **[BMPCriteria4_rate]**

0-100 _____

...the public acceptability of the practice. **[BMPCriteria5_rate]**

0-100 _____

6a. Please rank the following **TOOLS FOR MANAGEMENT** that emerged from ICC members' responses to the first round survey where 1 = highest priority, and 4 = lowest priority.

The ICC should...

_____...develop an identification guide for invasive crayfish, outreach materials for the public, and interactive distribution maps. **[MGMTTools1_rank]**

_____...work to develop a coordinated, standardized, rapid response plan to implement in the case of invasion that includes publicity materials for managers to justify action. **[MGMTTools2_rank]**

_____...develop a coordinated and standardized, monitoring protocol, including provisions for citizen engagement and environmental DNA monitoring. **[MGMTTools3_rank]**

_____...develop a comprehensive invasive crayfish management plan/document. **[MGMTTools4_rank]**

6b. How important are each of the following **TOOLS FOR MANAGEMENT** where 0 = not at all important, and 100 = extremely important for the ICC to develop?

How important is it that the ICC...

...develop an identification guide for invasive crayfish, outreach materials for the public, and interactive distribution maps. **[MGMTTools1_rate]**

0-100 _____

...work to develop a coordinated, standardized, rapid response plan to implement in the case of invasion that includes publicity materials for managers to justify action. **[MGMTTools2_rate]**

0-100 _____

...develop a coordinated and standardized, monitoring protocol, including provisions for citizen engagement and environmental DNA monitoring. **[MGMTTools3_rate]**

0-100 _____

...develop a comprehensive invasive crayfish management plan/document. **[MGMTTools4_rate]**

0-100 _____

7a. Please rank the following **POLICY NEEDS** that emerged from ICC members' responses to the first round survey where 1 = highest priority, and 5 = lowest priority.

The ICC should...

_____...develop recommendations/provide support for regulations surrounding the possession, sale, collection, importation, exportation of live invasive crayfish, including amending existing regulations to include emerging species of concern. **[PolicyNeeds1_rank]**

_____...encourage stronger enforcement where current regulations exist. **[PolicyNeeds2_rank]**

_____...generate mechanism for educating anglers at the point of sale regarding invasive crayfish, and associated regulation. **[PolicyNeeds3_rank]**

_____...develop recommendations for the standardization of regulations across region and by species. **[PolicyNeeds4_rank]**

_____...conduct a gap analysis of existing regulations surrounding invasive crayfish by state, identify areas for improvement/standardization/adaptation, and compare the efficacy of existing regulations. **[PolicyNeeds5_rank]**

7b. How important are each of the following **POLICY NEEDS** where 0 = not at all important, and 100 = extremely important for the ICC to address?

How important is it that the ICC...

...develop recommendations/provide support for regulations surrounding the possession, sale, collection, importation, exportation of live invasive crayfish, including amending existing regulations to include emerging species of concern. **[PolicyNeeds1_rate]**

0-100_____

...encourage stronger enforcement where current regulations exist. **[PolicyNeeds2_rate]**

0-100_____

...generate mechanism for educating anglers at the point of sale regarding invasive crayfish, and associated regulation. **[PolicyNeeds3_rate]**

0-100_____

...develop recommendations for the standardization of regulations across region and by species. **[PolicyNeeds4_rate]**

0-100_____

...conduct a gap analysis of existing regulations surrounding invasive crayfish by state, identify areas for improvement/standardization/adaptation, and compare the efficacy of existing regulations.

[PolicyNeeds5_rate]

8a. Please rank the following **RESOURCES** that emerged from ICC members' responses to the first round survey in terms of their priority for the inclusion on the **ICC WEBSITE** where 1 = highest priority, and 6 = lowest priority.

The ICC website should...

_____...contain links to species profiles (e.g., GLANSIS) and other already available materials online, including state and federal regulations, research labs websites/profiles. [**Website1_rank**]

_____...contain materials on crayfish identification and distribution, including fact-sheets for the public. [**Website2_rank**]

_____...have a list of members/experts profiles containing contact info, areas of expertise, geographic location, as well as a mechanism for interactions among members (e.g., discussion board, listserv), and an option for public inquiries and new members to join. [**Website3_rank**]

_____...be a clearinghouse of invasive crayfish research. Contain research abstracts, links to publications, and reports. [**Website4_rank**]

_____...contain a list of ICC goals, mission etc, as well as agendas from meetings, summaries of discussions, and information on upcoming meetings. [**Website5_rank**]

_____...contain a management toolbox with case studies on effective control, control options, and best management practice guidelines. [**Website6_rank**]

8b. How important are each of the following **RESOURCES** in terms of their priority for inclusion on the **ICC WEBSITE** 0 = not at all important, and 100 = extremely important?

How important is it that the ICC website...

...contain links to species profiles (e.g., GLANSIS) and other already available materials online, including state and federal regulations, research labs websites/profiles. [**Website1_rate**]

0-100 _____

...contain materials on crayfish identification and distribution, including fact-sheets for the public. [**Website2_rate**]

0-100 _____

...have a list of members/experts profiles containing contact info, areas of expertise, geographic location, as well as a mechanism for interactions among members (e.g., discussion board, listserv), and an option for public inquiries and new members to join. [**Website3_rate**]

0-100 _____

...be a clearinghouse of invasive crayfish research. Contain research abstracts, links to publications, and reports. [**Website4_rate**]

0-100 _____

...contain a list of ICC goals, mission etc, as well as agendas from meetings, summaries of discussions, and information on upcoming meetings. [**Website5_rate**]

0-100 _____

...contain a management toolbox with case studies on effective control, control options, and best management practice guidelines. [**Website6_rate**]

0-100 _____