



ICC Kickoff Workshop – Summary Notes

June 27, 2018
1:15pm - 5:00pm

The University of Chicago Gleacher Center
450 North Cityfront Plaza Drive
Chicago, Illinois

Facilitated by Pat Charlebois & Greg Hitzroth, Illinois-Indiana Sea Grant

Workshop PowerPoint presentations will be made available once the ICC website has launched.

1:15 Welcome

Charlebois welcomed all members, introduced the facilitators and reviewed workshop goals and agenda.

Charlebois facilitated a discussion of ground rules. Members agreed on the following:

- Don't talk over others.
- Agree to disagree.
- Raise card or hand for attention.
- Cellphones should be used in the hall.
- Laptop use should be limited to note taking.

1:35 Member Introductions

Hitzroth led the group through an icebreaker where individuals paired off. Pairs then discussed their crayfish-related background and what they were hoping to get from participation in the ICC. Individuals then introduced their partner to the group using this information.

The group also identified individuals, groups or organizations that should be contacted for inclusion in the ICC. These were:

- Canadian agencies
- Representatives from southern agencies & organizations including LSU (Bob Callala has a contact)
- Paul Brown, Purdue University
- Coastal Management programs
- Bill Perry, ISU
- Susie Adams, USFS
- Jim Stoeckel, Auburn University



- Biological Supply Houses
- Roger Thoma, Museum of Biological Diversity
- Derrick Passe, Lake County SWCD, Lake County, MN
- PIJAC
- NCRAC
- Great Lakes Fishery Commission's Enforcement Group

2:00 Consensus on Scope of Issues

Reuben Keller, Loyola University Chicago, presented an overview of the issue of invasive crayfish in the Great Lakes Region.

Charlebois led a discussion seeking additions or deletions to what was presented. Additions were:

- Funds for all work are limited.
- Pathways of introduction and spread need to be fully understood.
- Response/action will change with the waterbody and/or watershed that is invaded.
- Our understanding of invasive crayfish in the Great Lakes is low.
 - What is going on ecologically?
- Our understanding of impacts of invasive crayfish in inland systems is low.
 - We need to be thinking about inland impacts as well.

Charlebois then introduced a discussion on whether the group was in agreement on the scope of the issue. The discussion highlighted the fact that this group is not a decision-making body. It was suggested that within the context of the ICC, one's vote was not binding and was only to move the discussion forward. The group decided that for that meeting only, 2/3rds majority would be the rule. In general, the group agreed that the scope presented by Keller together with the additions suggested by the group seemed to encompass the issue for now.

2:30 Current ICC Funding

Charlebois presented the status of the activities and deliverables that were funded by USEPA's GLRI.

2:35 Results of Needs Assessment: Part 1 - Logistics

Charlebois led a discussion about the results of the needs assessment. She presented the fact that not all members or stakeholder types participated. Therefore, at this workshop, the facilitators were hoping to augment and finalize aspects of the needs assessment topics.



The first topic presented dealt with future communication. A mix of communication via webinars, virtual and in-person meetings was voted upon and agreed to by a 2/3rds majority.

2:45 Results of Needs Assessment: Part 2 - Goals

Charlebois presented themes from the open-ended, goal-related questions from the needs assessment. The following suggestions and questions were raised in the ensuing discussion.

1. Can goal #1 be our grand goal and goals a,b,c are how we get there?
 - a. Does goal #1 make it evident that we are prioritizing management needs?
2. How about “research strategies or set of priorities that help set up an agenda that establishes/develops management tools?”
 - a. How should we define management? What do we mean by it? Should we replace the word?
 - i. If we change the word or redefine it, will we become too specific/narrowed down?
 - ii. Should it be replaced by knowledge?
 - iii. Is it all encompassing (prevention, control, and mitigation of impacts)?
 - iv. What is the final outcome we want? Mitigate/Reduce impacts of crayfish?
 - v. Management may mean more long term goals rather than short term.

2:55 Identifying Research Needs and Knowledge Gaps

Hitzroth led an exercise to have small groups identify research and knowledge gaps within the 6 themes identified in the needs assessment. Each group was given the results of the needs assessment for one of the themes and was asked to identify whether each response was a research need (i.e., the research had yet to be done) or a knowledge gap (i.e., the research had been done but needed to be relayed to ICC members). Each group then presented the results for their theme on a flip-chart:

1. Basic Biology

Theme: 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.

Knowledge Gaps

- We need to capture aquaculture/hobbyist knowledge

Research Needs



- Physiological tolerances/Requirements (what do crayfish need to exist in certain places?)
 - Water chemistry, food, habitat
 - How will these things change with geography and climate change?
 - Can this turn into distribution/suitability layers that are similar to University of Wisconsin's AIS Smart prevention?
- Life history
 - How do impacts change over life cycle?
 - What are their overwintering abilities like?
 - Do we understand their reproduction, predation, prey?
 - Fecundity
 - Eric Larsen noted a 2013 paper in Freshwater Science on fecundity
- Are basic biological traits exploitable for control?
- How do all these things fit into risk assessment?
- Interactions
 - What are the community interactions of invasive crayfish?
 - Look at invasive crayfish interactions with other organisms
 - Rusty crayfish vs. Red Swamp; Marmokrebs; with Fish
- How do changes in the environment impact crayfish diet?
- We should look at habitat usage
- If we knew these things, we could manage systems and predict impacts

2. Distribution/Mapping

Theme: A need to develop accurate distribution maps of the currently occupied ranges of native and invasive crayfish.

****Note:** Rochelle Sturtevant: GLANSIS is planning on compiling/generating information on distribution of invasive crayfish. She welcomes distribution information and/or sources of this type of information.

Knowledge Gaps

- Systematic sampling/inventory using appropriate methods
- Absence and presence data needed for native and nonnative crayfish
- Effort data – where have we looked, what habitats were surveyed, what methods were used and can be developed?
- Regional data sharing
- Are crayfish being included into electronic (smartphones) technologies or mapping tools?
- Need to associate mapping with more detailed habitat data

Research Needs

- What is the current distribution of native and non-native crayfish?
- Is there overlap with habitat and species associations?



- Need to find and identify reference systems (inland and Great Lakes)

3. Control

Theme: 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.

Knowledge Gaps

- Habitat management that has been effective for red swamp crayfish may not be the case for other invasive crayfish
- Early detection
 - Educate citizen scientists on how to identify invasive crayfish
- IPM

Research Needs

- Look at barriers to invasive crayfish movement in flowing waters
 - If they are downstream, will they move upstream?
 - Could barriers be put into place to prevent them from moving?
- Pheromones
- Burrowing crayfish
 - How do we get them out of the burrows?
- Biocontrol options
- IPM
- Non-target impacts of control
- Understanding ecological threats/risks to determine what control is appropriate
- Genetic control
 - Similar to ones that were proposed for certain fish species
- eDNA markers
 - Are these useful for crayfish?

4. Impacts

Theme: A need to develop an understanding of the impacts of invasive crayfish on aquatic ecosystems and native crayfish.

Knowledge Gaps

- Ecological
 - Current knowledge of impacts to aquatic vegetation
 - Displacement of native crayfish
 - Food web impacts of invasive crayfish

Research Needs

- Ecological
 - Influence of crayfish spread on spread of invasive aquatic vegetation



- What are the effects of hybridization between native and nonnative crayfish?
- Indirect and direct impacts of vegetation/habitat (biotic and abiotic) change due to nonnative crayfish
- Crayfish plague: what is the invasiveness of different strains?
- Diseases and parasites carried by nonnative crayfish
- Anthropological
 - Effects of nonnative crayfish on property values
 - Loss/gain in recreational value after crayfish invasion

5. Pathways

Theme: 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.

Knowledge Gaps

- What kind of crayfish are coming through the following potential pathways?
 - Bait
 - Pet
 - Aquaculture
 - Live food
 - Biological supply

Research needs

- Ongoing research on diversity of crayfish in trades
- Cultural releases of crayfish
 - There are cultural releases of turtles, is this true for crayfish?
- Behaviors and practices of people who may spread crayfish
 - What are people thinking when it comes to crayfish? How do they dispose of crayfish?
 - How do we modify behaviors and practices of people to not do that?
- Ability of different crayfish species to 'naturally' colonize new habitats (vs. being introduced)
 - How far can these populations spread by themselves?

6. Risk Assessment

Theme: 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.

Knowledge Gaps

- N/A



Research Needs

- Literature search of risk assessment studies
 - This would allow us to identify geographical gaps and where additional research studies are needed
- Need surveys of different groups to assess current knowledge gaps
 - Professionals in AIS
 - Hobbyists
 - Recreationalists (boaters, anglers)
 - Elected officials
 - Resource managers
 - Teachers

4:55 Next Steps

The next meeting will be held in conjunction with the fall meeting of the Great Lakes Panel on ANS in Ann Arbor, MI.

Questions/Concerns to be addressed at future meetings:

- Roles and expectations for ICC members



ICC Kickoff Workshop – Attendance
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