FINAL NOTES

UPPER COLUMBIA WHITE STURGEON RECOVERY INITIATIVE (UCWSRI)
TECHNICAL WORKING GROUP MEETING (TWG)
NOVEMBER 18 AND 19, 2015 IN NELSON, BRITISH COLUMBIA

Attendance:

The following individuals attended all or some of the November 18 and 19, 2015 UCWSRI-TWG meeting: Paul Askey (FFSBC), Bill Baker (WDFW), Mitch Combs (WDFW), James Crossman (BC Hydro), David DeRosa (Teck), Amy Duncan (ONA), Chad Fritz (FFSBC), Bill Green (CCRIFC), Matt Howell (CCT), Lance Keller (CCPUD), Steve McAdam (BC MOE), Jason McLellan (CCT), Andy Miller (STOI), Teal Moffat (CPC), Chris Mott (GCPUD), Matt Neufeld (BC FLNRO), Mike Parsley (retired USGS, citizen expert), Louise Porto (AMEC), Reuben Smit (STOI), Alison Squier (Facilitator), Sarah Stephenson (BC FLNRO), and Will Warnock (CCRIFC).

UCWSRI-TWG MEETING DAY 1 – NOVEMBER 18, 2015

The group reviewed the agenda and desired meeting outcomes, completed introductions, and reviewed and confirmed the meeting behavior agreements. There were no changes to the proposed agenda and none of the participants identified any conflict of interest with the agenda topics under discussion.

1. TWG Business Items

1a. Dates for November 2015 through March 2016 teleconferences

- Tuesday January 26 at 1 pm Pacific
    - Tentative topics: Operational Plan review, updates on assignments from the November meeting, and other coordination needs
- Thursday February 25 at 1 pm Pacific
    - Tentative topics: April in-person meeting planning and other coordination as needed

1b. Dates and location for April 2016 in-person meeting

- April 12-13 in Nelson, BC (Location TBD)

1c. New member and/or observer requests

An updated list of UCWSRI-TWG members and observers as of November 2015 is included in Attachment A. Attachment A also includes a list of organization acronyms.

Paul Askey with FFSBC asked to join as an UCWSRI-TWG member. He replaces Adrian Clarke who stepped down from the TWG. Paul said he has worked on a number of different fishery related topics including the sockeye recovery initiative. He worked for the government for many years as a fisheries biologist.

Bill Green with CCRIFC requested that his participation in the UCWSRI-TWG be changed from a member to an observer and that Will Warnock (CCRIFC) who would be a member, replace Bill. Will said that he has been working for CCRIFC for three years and has an academic background (PhD) in conservation, biology and habitat. He was ad the University of Lethbridge before joining CCRIFIC.

Reuben Smit with the STOI requested that he be added as an observer to replace Justin Seibert (STOI) who is no longer with the STOI. Reuben was born and raised in the Midwest. He started working with sturgeon on the gulf coast in response to the BP oil spill. He has done lots of work with sturgeon. He worked with low cost side-scan sonar to identify spawning substrate for sturgeon on the Georgia coast and got his Masters degree on side-scan sonar work. He started working for the STOI in September.

UCWSRI-TWG Decision

- Paul Askey was approved as a TWG member.
- Will Warnock was approved as a TWG member.
- Bill Green was approved as a TWG observer.
- Reuben Smit was approved as a TWG observer.

1d. Education and outreach subgroup update

Jason M. gave an update on the UCWSRI website. The CCT have been working on the UCWSRI database for three years now and have a hosting contract with MS Azure. The Colville Tribes now has consistent funding for the database hosting and can manage the UCWSRI website too. However, to do so they will have to reconstruct the site to make it work on MS Azure. Because funding and resources were time sensitive, Jason M. talked with James C. and Brent N., and both said yes they would like the CCT to move forward with reconstructing the web site. That work is almost complete. The contractors asked if the TWG wanted consider a redesign to streamline the site a little more and they had some suggestions for how to improve it. For the time being Jason M. said no, but that work could be done in 2016. There were some problems with the previous host in Spokane, so the site was off line for a while. It is now up and running and will go live again on December 1, 2015.

Dave D. said he has been keeping track of activities directly or closely related to sturgeon outreach and education. He said teachers love the *Sturgeon in Our Schools Program* and want it to continue. Teck had a one-year commitment and thus there is no funding to continue (the program will continue in the East Kootenay's the additional Teck funding was to cover additional travel). The cost was about $21K. They did the program in 17 schools and made about 21 to 25 presentations. Dave asked FFSBC to leave some legacy documents and educational materials in the schools in case the program isn't able to continue. Dave will talk with others to see if there's someone else who could fund the portion Teck was funding. A couple schools in this area also visited the hatchery, and Teck got letters of feedback. For rest of Kootenay's the program went all the way up the Slocan as far as Slocan City. In addition to the sturgeon releases, there were at least three or four articles in the local papers.

Mitch C. reported that on the US side the Lake Roosevelt Festival continues to be a hit. Another 400+ students from 12-15 schools, including some home and church schools, participated. He said they use the old sturgeon kits and expand on those. The students also visit the hatchery. If releases coincide with favorable temperatures they also include the kids in fish releases.

Questions and discussion:

- Bill G. – Is the program continuing in East Kootenay's next year?
    - Dave D. – That's what I understand.

- Chad F. – The extra money for the travel is what Dave contributed.
- Bill G. – Would another avenue for funding by BC Hydro's grant program?
- James C. – It is probably too much money for that program, that's why I think the compensation program would be a good source.

- Mike P. – Should there be a link between this group and the Frasier River conservation society? They are doing a lot of really impressive outreach work.
  - Steve M. – I think the better link would be with the Nechako group. The Frasier group, they really do their own thing.

ACTIONS:

- **Jason M. will get the list of contractor recommendations for how to streamline the UCWSRI web site and present those to the TWG at the April 2016 meeting for discussion and decision.**
- **Dave D. will lead efforts to find funding for the travel component of the Canadian Sturgeon in the Schools program and report back on the January video/call.**

2. Sturgeon Mortalities

2a. Mortality reports

Discussion regarding 2015 sturgeon mortalities in the upper Columbia and other areas:

- Chris M. – There was an incident at our facility in October 2015. There were one or two juveniles entrained. They appeared to "shake it off" and moved on downstream. Later two juveniles were found floating and Golder responded. That unit taken off line. The fish recovered but had a lot of lacerations around the gills. We ruled out blade strikes. Later found another sturgeon carcass in the draft gates. It was missing its head and fairly well decomposed. The theory is that it was related to same October incident.
- Mitch C. – We had mortality in Lake Roosevelt on July 27. In addition, Olaf Langness put together summary sheet of mortalities to date on Columbia (US only) and Snake rivers (Mitch distributed a handout).
- Steve M. – Think there was a bias on the Columbia toward female mortalities.
- Lance K. – Speaking of the Chelan and Grant PUDs, we saw quite a few instances of females re-absorbing their eggs. It seemed like it was increased this year.
  - Jamie C. – We see some percent of that up here too.
  - Sarah S. – We had one adult dead female in the Kootenai River and she was also reabsorbing her eggs.
  - Steve M. – This pattern is similar to what we saw in 1994 with females. The theme of multiple stressors comes up everywhere.
- James C. – This year is the highest number of mortality observations that we've had this year on the Canadian side. It is something we should talk about. In the future we are likely to start to see more juvenile mortalities, responding to all of those could add up to a lot of money. When it's at a facility then it's important to respond, but if it is just along the shore we may want to identify a protocol for that.
- Mike P. – Something I've been bringing up in lower portion of the Columbia is that our mortality estimates are biased. Dead sturgeon most likely don't float. When we see them on the surface

we don't know what's going on below the surface. It is something to keep in mind. There is a good chance a large female has a different specific gravity than a male and the male is just sinking. There is a need for a review to see what the overall mortalities actually are. For example, it might be possible to use side-sonar. When you see carcass on the side of the river it is likely there are a lot more fish on the bottom.
    - Mitch C. – Olaf and others cautioned that 169 mortality count is a minimum.
- James C. – We used to only see lake sturgeon two or three days after they died because they'd gas up and float to the surface.
    - Mike P. – Sturgeon with that air bladder can degas and not float up.

ACTION:

- **Put discussion about mortalities including how to prioritize which fish we respond to, how to reduce costs, getting more accurate estimates of mortalities, etc. on April agenda.**

2b. Status update on the revised draft mortality protocol/flow chart

James C. showed the group the current working draft mortality protocol/flow chart from DFO. It is still in development so can't be distributed yet. James C. noted that it is Canada-centric. There's anxiety about mortalities among the hydro operators, but at the same time they want the information. It typically costs an average about $1,000 per fish to complete an assessment.

There was a protocol with DFO where you called the BC Report All Poachers and Polluters line (RAPP), then the information would be disseminated and then a decision made about whether to have a contractor go get the fish; however, opportunities to get the fish were being missed under that protocol. BC Hydro couldn't even go and touch the fish.

There has been a concerted effort to come up with a protocol that actually worked for everyone. The current draft has two different arms: under one arm a "Party" (i.e., operator) finds the fish; under the other arm the public finds the fish. The draft protocol is non-facility related; if a fish is found in a draft tube that is addressed under a different protocol.

Under the new draft protocol there are different categories e.g., a fresh carcass, or advanced stage of decomposition. Each operator would have a permit or could work with approved contractors to respond to mortalities. The protocol records whether the fish was retrieved or not and identifies basic information that would be recorded if it is a fresh (i.e., not decomposed) fish. The desired results it to get the information from the fish and put it into Jason's database.

Questions and Discussion:

- Sarah S. – One thing we are considering in the Kootenay is giving the information to conservation officers. Then they could scan the fish, take photos, etc.
- James C. – We have had instances in past where operators like Celgar who aren't that involved in the UCWSRI haven't know what do and were worried they would be on the hook for paying for it. That's why it is important we get a clear approach and funding worked out.
- Steve M. – Would like to add that we take fin rays.
    - James C. – There's a necropsy protocol in the back with step-by-step directions. For them to get the permit they have to be able to do the things required to get the samples.

- Steve M. – What about simplifying the sampling protocol? What are we actually doing with that information, are we actually using it?
- James M. – In the new protocol we have simplified the necropsy.

- Mitch C. – There isn't a clear protocol in place yet in the US.
  - Lance K. – We've altered our startup procedure.

ACTION:

- **Follow-up at the April (or sooner) to check on progress of Canadian mortality protocol.**

3. Database Update and Review

3a. Update and review of the new database structure and queries

Jason M. reviewed the history of the sturgeon database. He explained that the TWG identified the need for a white sturgeon management system for the US and Canadian components of the UCWSRI program and started discussions about how to do that almost a decade ago. The CCT got funding and started on the process to develop that database a few years back. And now they are just about to complete development of the applications. It is a Windows-based application that can be used offline so that it is possible to have field data entry. In developing it they ran into some problems because a lot of agencies wouldn't let third-party software be put on their servers. The found a solution with MS Azure which allows you to send an invitation and then people can load the software.

Jason reviewed the individual components of the database. He said that they would likely host a small workshop with the people who will be populating the data. The database includes the main data types used by the group: aquaculture releases, environmental conditions, stock assessment, admin (set all drop down lists, users name, can identify specific projects, etc.), early life history, macro invertebrates, and a mortalities log. He noted that everyone would be responsible for his or her own QA/QC when entering data.

One of the new things added this year is a mortality log. Jason M. reviewed the format with the group and requested input. He noted that it could be set up to more closely mirror the Canadian mortality protocol (i.e., party or non-party, etc.)

Jason M. said they had also planned for a telemetry component and link with Hydra. However, Hydra is a not for profit and they operate on donations, working with their programmers has stalled out because they either don't have time or aren't available. The Colville Tribes is trying to continue building those relationships with them in order to build a link.

Questions and discussion:

- James C. – Suggest having standard operating procedures in terms of how you name projects, gear, etc.
- James and Teal – Would be good to add organization in addition to first and last name.
- James C. – Clarified this is only for reported mortalities not for incidental mortalities.
- James C. – Recommend removing personal information on reporting. Reporting would be either by an agency or the public. Have a drop down field for the agency. Add a drop down list with the different entities that are approved to perform the necropsy.

ACTIONS:

- **Review database status again at April meeting (if applicable).**

4. Monitoring and Evaluation Activities

4a. Telemetry conflicts standing check-in

There were no identified telemetry conflicts or related issues that required discussion.

4b. Joint stock assessment findings to date and planned actions

James C. gave a verbal update on the Canadian portion of the stock assessment. They handled about 600 fish this year and took blood samples. He hopes to have a presentation on the analysis of the first three years of stock assessment data ready for the spring 2016 UCWSRI-TWG meeting. The next step is to look at the data that we've collected all together. There is now a huge data set.

Andy M. explained that the Spokane Tribe had had multiple challenges with equipment this season and was just finishing up field work at the time of the UCWSRI-TWG meeting so that had not been time to pull together the data yet. He will have an update for the spring 2016 meeting.

Matt H. gave a presentation on the Colville Tribe's portion of the US stock assessment work [see *Howell_US_Stock_Assessment_Nov_2015.pdf*].

4c. Update on the Arrow juvenile monitoring work

Amy D. gave an update on the Arrow juvenile monitoring work [see *Duncan_UC_Juvenile_WS_M&E_Nov_2015.pdf*]. She noted that for the next year they want to increase sampling the effort to 55 days with two crews working at the same time, and expanding the sampling areas.

Questions and discussion:

- James C. – The 2012 fish shown in the table are the only ones that weren't released the same year as capture. It seemed like in early years we only caught 10 and they were all fish that were released at the larger sizes. Now we're targeting 300 grams for next year, at least that's the plan. The hardest part is capture efficiencies. Fish are moving, they are catchable. But it is like a needle in a haystack.
- Sarah S. – Do you ever sample earlier in the season? For our gill net program our peak is earlier in August.
    - Amy D. – This year we sampled in September. It might be worth going later in the year.
- Paul A. – It might be that some of the years you put them in were the worst years for survival.
    - James – We just don't see them at all. We've had people who've found them in bull trout's stomach.
- Bill G. – When was transition to shelter bay?
    - James – All the fish would jet downstream until they hit the slower muddier water. Then we did two years farther downstream and saw the same thing again. So then we just released them closer to where they want to be. But we're limited by where we could access the river. Both burbot and bull trout can be tough on them too.
    - Bill G. – That 300-foot hole is where we saw a lot of overwintering of animals.

- James C. – We put in a high of 45,000 fish. Some of those should be seven years old now.
- Mike P. – So you have three more field years?
    - Amy D. – Yes.
- Steve M. – Maybe think of hitting some of the areas you haven't already hit – maybe they're on the bottom.
    - James C. – We can't sample the 300-foot deep hole, we can sample around it only. We've exhausted the telemetry. We tried to direct gill nets using directional acoustic hydrophone. The technology just isn't there for large water bodies yet. We don't want to stock fish in there if its not going to work.
- Steve M. – It might be informative to take a larger individual from downstream. Maybe take a more active approach.
    - James C. – I think we know that if we put a larger fish in there they'll survive, and they do already survive.
- Mike P. – The catch 22 is that you don't know why it's not working.
    - James C. – Yes, and we don't know they're not surviving. We know a few are getting eaten. The 300 gram release size is the last phase. I'm okay with putting fish up there but we'd want some sort of a permit.

5. Research Activities

5a. Update on the Canadian histology work (sexual stage and maturity in hatchery fish)

James C. gave an update on the ongoing work to determine sex and stage of maturity [see *Crossman_UCR_Sex_&_Stage_Nov_2015.pdf*][1]. He explained that there was a concern that if any of the hatchery fish start spawning they could quickly dwarf the adult breeders that are out there. So the challenge is can we sex them and determine the stage of maturity with confidence? The focus this year was primarily on year classes. They have about 40 samples so far and will ship those to Molly W. At this point they are confident on the sex but want the histology to confirm what reproductive stage they are at.

5b. Update on US investigations into sexual stage and maturity

Matt H. presented information on the US research into sexual stage and maturity as part of his stock assessment presentation [see *Howell_US_Stock_Assessment_Nov_2015.pdf*].

5c. Fin ray research

Steve M. showed a one-page document on current fin ray work [see *McAdam_Fin_Ray_Nov_2015.pdf*]. He explained that the picture is not a Columbia River sturgeon; however, he wanted to share the image and update with the UCWSRI-TWG group to see if there's applicability. This work is being done on Frasier River fish and is an analysis of strontium isotopes. The fish in the image died in 1994. They're seeing four nice "stanzas" of habitat use.

[1] Note the second objective slide in James C.'s presentation should not say "adult".

Steve's question to group is, what have other people seen in fin rays? When you see double banding is that in two years or in one year? Or other? Is banding associated with onset of reproduction, or food supply?

Questions and discussion:

- James C. – All the fin rays we looked at for age-at-release from the hatchery were all double banded. We did 50 from the hatchery and they were all double banded.
- Mike P. – Brenda Pracheil is really interested in microchemistry. There's going to be a lot coming out on this in a couple years. At the annual American Fisheries Society conference there was a whole session on this.
- Steve M. – In 2012 in our lab studies we gave fish gravel for three days, six days and a treatment with no gravel. The wet weights for all those treatments increased and the dry weights all decreased. We start thinking about it in terms of energy allocation. My feeling is what's happening when we give them gravel for six days is that we're turning on a normal gut development response, and then when we take away gravel they're struggling. One of the treatments I've always thought would be good, would be to bring gravel into the hatchery for a short period, but it looks like that may makes them allocate more resources.

6. Operational Plan updates

Participants identified updates to the Operational Plan (Alison will send a revised draft capturing those updates). In addition, participants agreed to the following:

- Confirmed that TWG previous agreement, the most recent version of the operational plan would be posted on the UCWSRI-TWG web site (and would be available for public viewing).
- Add a cover page to the operational plan.
- Add text to the web page explaining what the Operational Plan is, the relationship to the UCWSRI Recovery Plan, and the process by which is it periodically updated.
- The group also recommended adding an extra section to the document that captures what has been accomplished. Specifically, TWG members wanted to make sure that educational and other achievements were documented (e.g., number of schools that participated in programs each year, number of students, teachers, fish releases, etc.).

As part of this discussion UCWSRI-TWG members also discussed whether an annual report was needed, if the Operational Plan filled the need, or if some other report was required.

- What would be in an annual report?
    - The previous reports had detailed descriptions of all of the projects underway. Member don't want to write up individual project descriptions for every line in the Operational Plan
    - Previous reports have included release numbers which are available on the web site.
    - Jason M. said it would be possible to generate a simple canned report.
    - James C. said their agency would want a summary of current issues which wouldn't be addressed in a canned report.
    - UCWSRI-TWG members agreed for now not to do an annual report. They agreed that the Operational Plan and web site would meet the majority of needs previously filled by the annual report. The group will revisit the question in the future if needed.

ACTIONS:

- **Alison will incorporate edits from November meeting, add a new draft section to capture accomplishments, and distribute that to the UCWSRI prior to the January teleconference or April meeting.**
- **Alison will send the most up to date version of the Operational Plan to Jason M. to post on the web page and draft accompanying language.**

7. Other

Participants reviewed and discussed the email to the whole TWG from TWG member Bob Hallock. The group reviewed the major points Bob H. raised in the email and identified the following general responses to each of the points:

Bob Hallock email points:	UCWSRI-TWG Discussion:
Kinbasket • Translocate white sturgeon to this reach • Consider use of Kootenai River white sturgeon to translocate to this reach	Kinbasket • Do we want to move more quickly to an experimental reintroduction than is currently being done through BC Hydro? If yes, would you use Columbia River or Kootenay River stock? • This is not part of the Federal strategy. Would need to agree to prioritize this. • It is part of the long-term plan as is. It just isn't a top priority right now. It is identified as a "second recovery area".
Arrow below Revelstoke • Don't invest more there • Minimum flow is not needed	Arrow below Revelstoke • The minimum flow is not a sturgeon flow. • Yes, everyone agrees it is hard. • Do need to have a discussion about when to move on from this reach? When do we know that we tried as much as we should? • There are three years of work left in this reach under the current plan. • There is currently a process in place to evaluate the outcome.
Lower Columbia/Transboundary Reach • Reviewed range of possible actions discussed in past: addition of turbidity,	Lower Columbia/Transboundary Reach • We're working on many components identified as part of the Operational Plan e.g., working towards habitat restoration, working towards addressing flow, working on substrate. We are not working on passage. • TWG could review the recruitment failure hypotheses for each reach (e.g., which are still in play, are we doing what

Bob Hallock email points:	UCWSRI-TWG Discussion:
flow, substrate, passage • Recommends reviewing options again • Do something!	we need to do, what's next) at the next two UCWSRI-TWG in-person meetings. • Bill Green suggested re-weighting the hypotheses. Do lower Columbia at one meeting and Arrow and Kinbasket at another.
Flow remedies • Need more years with higher flows • Its likely we cant get to the magnitude of flows we need	Flow remedies • Have evaluations of what fish are doing under current flows (Hydraulic modeling, looking to find scenarios that might be implementable) • Not as simple as peak flows (need to think about duration, etc.) • Have made recommendations on flow through Columbia River Treaty (CRT) process through Tribal and other avenues. • USACE is revisiting flood risk management targets for Dalles Dam as a result of Tribal input into CRT process • UCWSRI-TWG agrees that we need to test higher flows. We don't know what a specific flow should be (i.e., a prescriptive flow to get more recruitment)
Pend Oreille • Fish passage	Pend Oreille passage • No evidence of sturgeon use of Pend Oreille • No evidence that restoring passage would increase recruitment • Fish that hang out in Waneta reach declined long after 1954 • There are no existing resources to allocate to this effort – would need new resources. • Come and make your case at the next meeting • We've started restoration efforts in other areas, believe we should keep focused on those first.

Adjourn Day 1

UCWSRI-TWG Meeting Day 2 – November 19, 2015

1. Conservation Aquaculture

1a. US larval collection update

Matt H. gave a presentation on the US larval collection [see *Howell_US_Larval_Collection_Nov_2015.pdf*]. He noted that the catch of hatchlings is about 3% of

larvae and asked the TWG, what they would expect the catch to look like? If hiding habitat is the problem, he suggested, you'd expect to see more free larvae.

The new aluminum frames they've developed are anchored in place and are very light and easy to handle.

Questions and discussion:

- Dave D. – Are you picking up anything else interesting?
    - Matt H. – Yes, we had a sculpin this year that was full of sturgeon. Also we got a juvenile sturgeon.
- Mitch C. – What are the net dimensions?
    - Matt H. – They are about 100 inches wide.
- Steve M. – Regarding your questions, I think there's some good evidence that larvae are successfully hiding in your reach. We know that you had some years when you had differences in that ratio.
    - Jason M. – Placement of sampling gear also has influenced the results. This set up is placed downstream of the spawning area. In the past we had spots distributed up and down the river because we were looking at early life history.
- Steve M. – I can see various ways that substrate can screw things up. I think there's a gradation of how screwed up habitat is (e.g., the Kootenai has lots of sand). You're probably the best case in that you do have hiding habitat, but it isn't functional in terms of providing recruitment. We can't get that same result for Waneta.
    - Jason M. – But we see that same bimodal catch pattern downstream of Waneta.
- James C. – I want to get all our larval drift distributions over the last three-four years and look at those.
    - Jason M. – We did that in 2008. We had stations between Waneta and Northport. When we looked at when spawning was detected at Waneta and Northport there was pretty good evidence that we were catching fish from spawning events at both locations.
    - James C. – I would like to look at that.
    - Jason M. – We stopped doing spawn monitoring when we learned that spawning was happening at Northport.
- Steve M. – Do you have any feeling from 2008 of the ratio of yolk sac to feeding larvae.
    - Matt H. – It is hard to know because we only sample during the day.
    - James C. – We'd love to sample just below the larvae. We only get eggs not larvae. We don't know if since the spawning is right there if they're just hatching.
    - Jason M. – When we ran the multibeam survey we found that it's not sand between the borders and Waneta, it is rubble, cobble, and boulders.
- Steve M. – There's still more to understand about what is good habitat. We just can't get that in the lab. In looking at early reports on the Revelstoke reach, it seems that there's okay habitat but there's room to improve it. The stuff you'd call good objectively still doesn't appear to be retaining larvae.
    - James C. – When we put larvae in the thalweg there, we caught them for 30 days, but ran out of monitoring funds. The caution is that flows are artificially high there so they may get blown out of the habitat. We need to get that 2011 data. We genotyped everything we collected in 2011.

- Dave D. – Between Castlegar and the border the depositional habitat is estimated at 2-3%, the rest was erosional; that was post 2012.
- Mike P. – In the sampling corridor is there a lot of variation in the seasons?
    - Matt H. – Looking at the data it is fairly uniform. It may decline slightly moving downstream.
    - Mike P. – It sounds like you've nailed it down during typical conditions.
    - Matt H. – What limits us is the number of buckets we can process. We've talked about whether if we set up a barge we could get perhaps 100,000s of thousands of larvae.
- Mike P. – So basically that's not the recruitment bottleneck. Something is taking them out between there and Marcus flats.
    - Jason M. – Yes, they are drifting at night. There's virtually no flow and that's when they're doing load shaping so there is even less flow than would normally exist. There's also more deposition in that area. There are a lot of larvae, spawning is occurring, there's good incubation and adequate hiding habitat.

ACTION:

- **Make note of placeholder to discuss trap and haul as a potential option at April 2016 meeting or beyond.**

1b. Update on US hatchery operations

Mitch C. gave an update on the US hatchery operations (he did not have a presentation). He said there hadn't been any releases since his last update at the April 2015 meeting. Last March they released about 2,800 fish averaging 77 grams each. Then had an opportunity because of the amount of larvae being collected. They sent some to the Colville hatchery. Since they don't have heating capability at the Colville hatchery, on July 1 they brought them back to Sherman Creek at which point they were about 50 grams. They put them on ambient water. They now have about 1,200 fish that are 365 grams each.

This year they were also able to test what it is like holding two brood years. If they have to release fish at target size with their current infrastructure that means releasing them at about 1.5-year-old. When they have to move the current fish out of Sherman Creek in the spring, they will transfer them back to Colville resident fish hatchery to hold them and then in June they can bring them back to Sherman Creek again and raise them up to the sizes we want.

Mitch and the managers would like to release them as staged releases as they reach size. The goal would be to have them planted out by November 1 instead of the end of November because of the hatchery's challenges with temperature. They're trying to balance resources for BY2015 and BY2016. The objective is to concentrate the better temperatures on the younger fish.

1c. Update on all components of the Canadian program

Chad F. gave an update on the Canadian conservation aquaculture program [see *Fritz_CA_Hatchery_Update_Nov_2015.pdf*]. He explained that they had a catastrophic fish loss at the end of August. They lost about 1,000 of the Arrow Lake holdovers. They now have 1,304 of the Arrow fish left. At 9°C they didn't expect a lot of growth; however, surprisingly they are growing quite well. At the current growth rate they'll be about 800 grams by release time in May. They lost almost all of BY2014 wild progeny. The 2015 year class is looking really good.

1d. Autopolyploidy (Canada and U.S. UCWSRI programs, other programs as relevant)

Chad F. gave an update on autopolyploidy in the Canadian portion of the program [see PPT *Fritz_Autoploypoidy_Update_Nov_2015.pdf*]. The 2013 year class 12N fish were screened out and not released. There were two wild fish caught on egg mats in Waneta that were 12N; that may or may not have been an error. They were not released.

James C. said that they continue to sample all fish as part of the stock assessment work on the river. The the wild fish that were tested were very young, autopolyploidy may be happening in nature but the fish just don't survive. They are picking out the 12N fish when they find them. Hoping to get a sense of the proportion of 12Ns that are out there.

ACTION:

- **Add discussion of UCWSRI autopolyploidy results to date to April agenda. If possible, invite Shawn Y. from Kootenai Tribe or Andrea from UC Davis to share information.**

2. Production, stocking targets and related issues

2a. Updated survival analysis

James C. gave an update on the ongoing juvenile survival analysis [see *Crossman_UCR_Juvenile_Survival_Nov_2015.pdf*]. He has made some additional refinements since the analysis that was presented at the spring 2015 UCWSRI-TWG meeting. There were some errors in the numbers of fish released over the years that needed to be corrected. The next step will be reworking the adult estimates. Those will be presented at the April 2016 UCWSRI-TWG meeting. The overall conclusion is that the survival of hatchery progeny is higher than originally predicted.

Questions and discussion:

- William W. – What is the flip side of holding on to fish until they're 200 grams, are you worried about hatchery effects?
    - James C. – Imprinting is already off the table because we assume it's happening very early. We've talked in the past about wanting to be able to imprint them for a few months, but right now the focus is on maximizing survival to get at genetic diversity questions. Holding fish over we really have zero mortality except for the recent catastrophic event.
- William W. – For the long-term goal is there a desire to replicate what natural survival would be?
    - James C. – We don't have any reference for that. We don't have a lot of confidence of what survival is in other populations either. Sturgeon are historically boom or bust.
- Steve M. – In the Columbia we've seen that growth is higher than in other areas. It's really hard to compare to other populations. That's where the carrying capacity modeling will be informative. The question we'll need to look at is if there a point where density dependence becomes limiting.
    - James C. – Yes, we want to get confidence in what our long-term population should be, then we take a step back and determine what the annual population should be.
- William W. – For doing ecosystem modeling, have you got information on what other populations of fish should be? Sturgeon feed off spawning rainbows.
    - Jason M. – We know they're eating non-native crayfish.

    - Mike P. – You need to consider that they are eating those species, but they are also recycling nutrients. So you might see some compensation in terms of prey.
    - Dave D. – In terms of ecosystem modeling we've got 17 years of data in the indexing program. We will likely see changes in those populations that they're monitoring if there's something significant happening.
    - Paul A. – Before you go to a full ecosystem model it seems like you need to get with the basic life history model. That other stuff is expensive. If you have limited data, it is garbage in and garbage out.
    - Steve M. – Another point on do they eat exotic or introduced fish?
- Matt N. – Using survival estimates between populations is challenging. But in the Kootenai survival is really different.
- James C. – The newly released fish may even need to be bigger than the 200 grams just to compete with the others.
- Jason M. – When I looked at recaptures up through brood year 2013, there are year classes that were never captured in any of the BC sampling. It may be that there are some density dependent effects in the Keenleyside reach and they're not growing fast enough to recruit to the gear.
    - James C. – Yes, that makes a lot of sense.
- Mike P. – Is our ongoing stock assessment program going to allow us to fill this table out?
    - James C. - Yes, that's the objective.
- Paul A. – You'll want to continue that and fill this table out before you begin other ecosystem modeling.

ACTION:

- **James C. will send an updated report on the juvenile survival to the TWG in January 2016.**

2b. How to deal with very strong year classes (US/Canada)

Jason M. presented a summary of the Lake Roosevelt managers' concerns about overrepresentation in the population of very strong year classes. This was followed by a group discussion about possible options for dealing with the issue of strong year classes and next steps.

Jason M. explained that the conservation aquaculture program in Washington started with surplus fish from the BC program. The US program became self-sustaining in 2006. There is a fair amount of disparity in the family size represented in the catch in each year. At this point the vast majority of fish in the system are offspring of a very small number of parents, even though a lot of fish have been used for the program over time. The Lake Roosevelt managers are proposing that there be an immediate reduction of certain families and year classes. Jason M. confirmed that all hatchery releases were considered in the analysis (i.e., US and Canada).

Participants identified the following major questions or considerations related to possible removal of the disproportionate year class:

- What is the right number to remove?
- Timing and severity of genetic risk, and impacts to food base
- How to build removal into the abundance estimate (to be discussed at April 2016 meeting)
- Permitting requirements (US and Canada)

- What is effect of differential response (i.e., cull in US but not in Canada) on the overall transboundary program?
- Legal and public issues, concerns from NGOs, etc.
- Need to demonstrate significant risk to wild population to justify action
- Possible need to have peer review of plan
- Are there other similar examples we could look at (i.e., removal in other populations)?

Based on group discussion, participants identified and agreed to the following next steps and assignments and timelines:

- Compile information on actions needed and rationale for those actions (transboundary population)
    - Review 2013-2015 catch by family
        - Jason M. will lead this effort. He will coordinate with Andy M. and James C. Due date is January 26, 2016 conference call.
    - Define risk (risk analysis)
        - Abundance by brood year
            - James C. will lead this effort. Analysis is largely complete; James will confirm that the correct release data is included. Due date is January 26, 2016 conference call.
        - State of maturity by size and age
            - James C. will lead this effort. James C. will create a table of results to date. An initial product is due by the January 26, 2016 conference call and a final product will be completed for the April 2016 in-person meeting.
        - Effective population size with, and without, the families that are disproportionally represented.
            - Need to complete abundance by brood year and stage of maturity by size and age prior to doing this. No assignment made in November. The next step is to identify who will do what, by when, on the January 26, 2016 conference call.
        - Time aspect to effective population size.
            - Need to complete abundance by brood year and stage of maturity first. No assignment made in November. The next step is to identify who will do what, by when, on the January 26, 2016 conference call.
        - Ecosystem risk assessment (this was deemed a lower immediate priority but might be necessary in the future for the Canadian process)
            - Possible approaches to address ecosystem risk
                - Use of UBC graduate student (Ecosym). Next steps is that Steve M. will check with the graduate student regarding her availability/interest and report back on the January 2016 call.
                - Meet with EcoScape folks to see if they could do an analysis using existing data. Next step is that James C. and Dave D. will look into the EcoScape option and report back on the January 2016 call.

        - Possibly limit the question being addressed to consumptive pressure. James C. will look into approaches to model bioenergetics and report back on the January 2016 call.
    - Identify DFO considerations that would need to be addressed in statement of risk
        - Steve M. will coordinate with DFO to identify what major issues they would need to see addressed

- Develop summary (table/flow chart/discussion) of management options
    - Identify pros and cons, risks, and related specifics at work session at April 2016 in-person meting based on information generated in risk analysis.
    - Initial brainstorm of options:
        - Do nothing
        - Discontinue stocking
        - Mechanical removal
            - Opportunistic (i.e., remove when handle them as part of joint stock assessment, etc.)
            - Targeted effort to cull specific families
        - Harvest
            - Tribal
            - Recreational
            - Commercial
        - Mechanical removal and harvest combination
        - Relocation

- Determine how many fish to remove
    - Equalizing family sizes was identified by participants as a logical starting point
        - Need three years of data on family contribution to catch
        - Replicate what Jason M. did with all of that data. Jason M. will lead this effort and will coordinate with James C. Report on progress on January 2016 call.
    - Based on results of above, develop a recommendation for where to start. Discuss next steps on the January 2016 call.

ACTIONS:

- **Jason M. to coordinate with Andy M. and James C. to review 2013-2015 catch by family. Report findings and/or progress on January 26, 2016 conference call.**
- **James C. compile abundance by brood year (largely done but need to ensure correct release data incorporated). Report back on results and/or progress on January 26, 2016 conference call.**
- **James C. create table of results on state of maturity by size and age to date. Report back on progress on January 26, 2016 conference call. Develop final product for the April 2016 in-person meeting.**
- **On January call identify next step(s) to determine abundance by brood year and stage of maturity by size and age (precursor to identifying effective population size with, and without, the families that are disproportionally represented) and who will do what by when.**

- **Ecosystem risk assessment (this was deemed a lower immediate priority but might be necessary in the future for the Canadian process)**
    - **Steve M. will check with UBC graduate student regarding her availability/interest in helping with this (Ecosym) and report back on the January 2016 call.**
    - **James C. and Dave D. will look into option of using EcoScape to do analysis using existing data and report back on the January 2016 call.**
    - **James C. will look into approaches to model bioenergetics (consumptive pressure) and report back on the January 2016 call.**
- **Steve M. will coordinate with DFO to identify what major issues they would need to see addressed in a discussion of risks.**
- **Jason M. will coordinate with James C. on compiling three years of data on family catch as part of steps to determine how many fish to remove (looking at equalizing family sizes as possible starting point) and report back on progress on January 2016 call.**

2c. What to do with 5,000 US surplus fish in 2015

Jason M. provided an update on Lake Roosevelt managers' discussions preferred options, and other alternatives for the future. He explained that there are about 5,000 surplus Lake Roosevelt fish that were set aside for the Wells program. The Lake Roosevelt managers identified four potential options for what to do with them. The options are:

- Option 1 – Offer all 5,000 to FFSBC to make up for the 2015 hatchery mortalities. The US and Canadian parties have been working on securing the necessary permits to at least have them in place if the UCWSRI-TWG is supportive.
- Option 2 – Scute mark and PIT tag all of them and release them into Lake Roosevelt at whatever size they are at the point in time they have to be released from the Sherman Creek hatchery. The justification is that they're wild produced. In past years the group hasn't always met the size or abundance targets of wild fish. This would make up for some of that.
- Option 3 – If Option 1 or 2 isn't possible, release them somewhere else. That would require a lot of work.
- Option 4 – Bury them. This is the least preferred alternative.

ACTIONS and AGREEMENTS:

- **Chad F. to determine requirements associated with the Canadian food inspection permit and report back on the January call.**
- **UCWSRI-TWG members agreed that the 5,000 Lake Roosevelt surplus fish (Wells Program) will go to Arrow pending completion of all necessary permits. If it isn't possible to get the required permits in time, the 5,000 fish will be released into Lake Roosevelt in January (PIT tagged and scute marked).**

2d. What to do with, and/or how to allocate "surplus fish" in 2016 and beyond (including larvae and juveniles).

Jason M. said that for the Wells stocking program the current target is 10,000 larvae. In addition to just trying to meet the target number they are also trying to sample as much of the run as possible. To meet the program objectives, they've been collecting about 20,000 larvae each year. The goal for 2016 will be 20,000 fish. The timeframe for release of the fish designated for the Wells stocking program is the end of January at a target release size of 200 grams. In the US, there's a space issue that results in reduced the growth of the Wells target fish after a while. The Wells program will have a planned reduction of stocking numbers in next few years. It is likely that Lake Roosevelt will have (and could provide) surplus fish in future years.

Questions and discussion:

- James C. – We may need to establish a stocking target on the Canadian side e.g., up to some identified number and then backfill with US stock to meet the target. We may need to figure out what we would want to flat line each family down to.
- Another option would be to coordinate direct larval transfers (i.e., with or instead of transfers of surplus fish)

Participants identified the following pros and cons of future relocation of surplus Lake Roosevelt fish to Arrow and/or the transboundary reach in BC:

Pros	**Equal Parts Pro and Con**	**Cons**
• Increased genetic diversity • Maintain Arrow experiment (i.e., complete the years of stocking that have already been committed to) • Addresses challenges of catching wild larvae on Canadian side of border • Could flatten out lows in the Keenleyside Reach	• What is proportion of Canadian origin fish in samples (spawning grounds)? • Uncertain how many spawning locations are represented in the catch	• Potential they are not representing the full genetics of the transboundary reach • Might get fish for Arrow by other means and then that would create another surplus • Even if there's agreement on Arrow, there are still reservations about the transboundary reach • If they're imprinted in the US that could be a con; however, we're not sure about imprinting

ACTIONS:

- **Check in with TWG members on January call to see what information we need to assemble to support a robust discussion at the April 2016 in-person meeting about future translocation of fish to Arrow and/or the transboundary reach.**
- **Add topic to April meeting agenda.**

2e. Confirm production targets for upcoming year

Participants agreed to the following production targets for 2016. These were largely the same as those agreed to in 2015 with some minor adjustments/clarifications.

TWG agreements:

- **Production targets**
  - **US ~1,000 @ 200 grams**
  - **Canada as many as possible at 200 grams**
  - **Release in spring**
  - **In US sampling the peak is sufficient**
- **Lake Roosevelt**
  - **2015 – no broodstock (completed)**
  - **2016 – Maybe broodstock, but unlikely**
  - **2017 – wild collection and broodstock for paired larval releases**
- **Lower Columbia**
  - **2015 – 2,800 BY2015 plus wild (completed)**
  - **2016, 2017 and 2018 – wild collection.**
- **Arrow**
  - **2015 – ~2,800 @ 150-200 g BY2014 (done, these were stocked in May)**
  - **2016 – ~1,300 (original goal was 2,800 but hatchery mortalities in 2015 lowered number) BY2014 at 300-400 grams**
  - **2017 – proportion of wild collection @ 300-400 grams**

ACTION:

- **Add discussion of challenges associated with holding multiple year classes in the BC hatchery to the April 2016 agenda.**

3. Habitat Assessment and Restoration

3a. Update on the Teck's hydraulic modeling study

Dave D. reported that Teck awarded the contract to do the hydraulic modeling to ASL as of today. There will be two stages one in 2015 and another 2016 (Birch Bank to Pend Oreille). For this year they'll compile info from 1997 to present.

James C. explained that this work is addressing one of Steve M's hypotheses that in 1977 there was an overage from the Pend Oreille and the Columbia overtook that area and filled it in with sediment and it has never recovered since. After looking, they can see the substrate in the area is large boulders, cobbles, etc. When Waneta goes down in load there are some changes in that area, but it is uncertain in my mind whether the Columbia could deposit sediment

3b. Update on Lake Roosevelt modeling plans

Jason M. gave a presentation on the Colville Tribes' Lake Roosevelt modeling plans [see *McLellan_US_Habitat_Assessment_Nov_2015.pdf*]

3c. Pike updates

- Dave D. – Under the funding that also funds the hydraulic modeling, they were able to complete one year of pike work. Under other commitments Teck agreed to do three more years of pike monitoring with Matt N. Jeremy Baxter does initial gill netting, it is basically a removal process.
- Matt N. – TRU (spelling?) is working with a master's student to look at whether pike are recruiting in the Columbia or not. They are removing fish. It looks like it's working reasonably well.
- Bill B. – WDFW in Spokane and the Colville Tribes also did some pilot pike work in Lake Roosevelt in June this year. They noticed fish showing up in late February and March this year. They put together quick pilot netting project to look at where the hot spots might be and found areas around Evans, Singers Bay, and the mouth of the Colville. It looks like there are one or two year classes. Currently looking at whether some sort of management action is warranted. They are in higher numbers than was thought.
- Jason M. – There's been a limited amount of microchemistry done, which indicates that fish were from the Kettle River.

4. Updates and Information Sharing from Other White Sturgeon Programs

4a. North American Sturgeon and Paddlefish meeting in Oshkosh

- Mike P. – Chad F., James C., Larry H., and Sarah S. were at the meeting. Lynn P. from NPCC also attended. It was a great meeting and well attended with about 150 people there. There were a lot of students and people representing many different sturgeon species. There were two days of talks and two concurrent sessions. There are several of us proposing holding this meeting in 2016 in Hood River, OR. There were several workshops at the meeting including: sexing, aging, and conservation genetics. We also had several listening sessions to find out what members want to do at these meetings. Some of the suggestions included workshops for advanced telemetry, etc. Engaging student in the meeting was really key to the success.
- James C. – Yes, it was a great meeting. The quality of talks was some of the best I've seen at a sturgeon meeting. People were really engaged. I would like to role that success into the next meeting. Membership is up to 160 people, that's more than three times the World Sturgeon Conservation Society (WSCS). The next WSCS meeting is in Vienna Austria in 2017. That year the NASPS meeting will be concurrent with AFS. We had four main areas for talks: recovery, fish passage, telemetry, and genetics. There was interest from members in having panels at future meetings too. All the species except shortnose were well represented. We also now have a student subunit.

4b. Nechako update

- Steve M. had to leave the meeting early so could not report on the Nechako. Chad F. said that the Nechako group had a target of 12,000 fish for release this year in the hatchery. It is a brand new state of the art research circulation facility. They'll be slightly under their target release numbers this year.

4c. Mid Columbia (US) updates

- Lance K. – Chelan PUD just completed the third year of monitoring. A big issue for group is that there is not a consensus on release numbers for 2016. We have 2015 brood. We have fish on station and are trying to figure out where to release those fish. There was recently a policy committee meeting that identified genetics as major factor in deciding where to stock fish. That group has been talking recently about management plans and about stocking to carrying capacity. We were initially talking about having the third year of monitoring be the last year, and then checking in every three years. The group agreed that the current monitoring is good but it is not telling us much yet. We will continue for another three years and then bring in a diet composition component. The same conversations are coming up there that this group is dealing with. That group would like to make the transition to larval fish.
- Mike P. – A big issue in the US mid Columbia is the downstream movement of fish. All of the fish released from the mid Columbia PUDs are from the same broodstock collection. They are all from the same gamete take. That links to some of the genetic concerns we have in the UCWSRI.
- Jason M. – Another project that isn't represented by anyone here today is the Wells project. They completed their first year of monitoring on their releases releases. They caught the first wild fish in the reach. That suggests there is some recruitment in the Wells pool. That's interesting since it is essentially a run of the river facility. Unfortunately, they didn't collect any tissue samples on those fish.
- Lance K. – Another interesting observation is that one of Chelan PUD's fish was documented in the tailrace of Chief Joe Dam. Andrew Gingerich from Douglas PUD was describing how it could have been locked up through maintenance activities.
    - Jason M. – They don't believe it went through the ladder because the ladder detection efficiency is 99%. The Okanogan River is warm, shallow, and turbid. It receives a massive run of sockeye. About 80% of the sturgeon released so far had made movements up the Okanogan River. The detection frequency is 30%. Also there is another smaller intermittent tributary in the Okanogan that a sturgeon went up and explored.

Adjourn

Attachment A

UCWSRI-TWG Members – As of November 30, 2015:

Paul Askey	Freshwater Fisheries Society of BC (FFSBC)
Bill Baker	Washington Department of Fish and Wildlife (WDFW)
Scott Bettin	Bonneville Power Administration (BPA)
Mitch Combs	WDFW
James Crossman	BC Hydro
David DeRosa	Teck
Chad Fritz	FFSBC
Bob Hallock	Citizen, retired U.S. Fish and Wildlife Service (USFWS)
Larry Hildebrand	Golder Associates
Wendy Horan	Columbia Power Corporation (CPC)
Matt Howell	Colville Confederated Tribes (CCT)
Steve McAdam	BC Ministry
Jason McLellan	CCT
Andy Miller	Spokane Tribe of Indians (STOI)
Martin Nantel	Department of Fisheries and Oceans Canada (DFO)
Matt Neufeld	BC Ministry of Forests Land and Natural Resource Operations (BC MFLNRO)
Brent Nichols	STOI
Mike Parsley	Citizen, retired U.S. Geological Survey (USGS)
Will Warnock	Canadian Columbia River Inter-Tribal Fishery Commission (CCRIFC)
Michael Zimmer	Okanogan Nation Alliance (ONA)

UCWSRI-TWG Observers – As of November 30, 2015:

Paul Anders	University of Idaho, Cramer Fish Sciences
Vanessa Benwood	Zellstoff Celgar LImited Partnerships
Charlee Capaul	CCT
Amy Duncan	ONA
Jason Flory	USFWS
Andrew Gingerich	Douglas County PUD
Bill Green	CCRIFC
Paul Grutter	Golder Associates
Cara Holem-Bell	Kootenai Tribe of Idaho (KTOI)
Sue Ireland	KTOI
Mike Keehn	FFSBC
Lance Keller	Chelan County PUD
David Knight	Washington Department of Ecology (WDOE)
Pat McGuire	WDOE
Teal Moffat	CPC

Chris Mott	Grant County PUD
Gerry Nellestijn	Salmo Watershed Streamkeepers Society
Louise Porto	AMEC Nelson
Jim Powell	BC Centre for Aquatic Health Sciences
Reuben Smit	STOI
Sarah Stephenson	BC MFLNRO
Sheila Street	Fortis BC
John Whalen	WDFW
Shawn Young	KTOI