



SOUHEGAN TECHNICAL REVIEW COMMITTEE
NH Rivers Management and Protection Program
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Souhegan TRC Committee Meeting Minutes
Tuesday, June 6, 2006
29 Hazen Drive, Concord, NH
Rooms 111 and 112

Members Present:

Ralph W. Abele
Douglas Bechtel
Representative Richard T. Cooney
Alden T. Greenwood
Dr. Kenneth D. Kimball, Chair
Vernon B. Lang
James MacCartney
John Magee
Carl Paulsen

Technical Representatives

US EPA, Manager of NH State Program Unit
Conservation Interests, The Nature Conservancy
House of Representatives, RR&D Committee
Business Interests, Alden Engineering
Conservation Interests, AMC Research Dept
US Fish & Wildlife Service, NE Field Office
Conservation Interests, Trout Unlimited
NH Fish & Game Department
Conservation Interests, NH Rivers Council

Members Absent:

Jeff Deacon
John R. Nelson
Thomas Roy, Vice Chair
Donald L. Ware

USGS, District Chief, NH-Vermont District
Business Interests, Geological Society of NH
Business Interests, Aries Engineering, Inc.
Business Interests, Pennichuck Water Works

Others Present:

Affiliation

James Donison	City of Concord
Timothy Fortier	McLane Law Firm
Al Larson	Normandeau Associates
Mark Hutchins	Normandeau Associates
Lee Carbonneau	Normandeau Associates
Tom Ballestero	University of New Hampshire
William Heinz	RMAC
David Brooks	Nashua Telegraph
Piotr Parasiewicz	NEIHP UMASS
Spencer Brookes	Souhegan LAC
Diane Fitzpatrick	Milford Conservation Commission
Bill?	

DES Staff Present:

Wayne Ives, Instream Flow Coordinator
Marie Loskamp, Executive Secretary, Watershed Management Bureau
Steve Couture, DES, Rivers Coordinator
Rick Chormann, DES, NH Geological Survey
Paul Currier, DES, Administrator Watershed Management Bureau

9:30 – 9:45 Acceptance of February 13, 2006 minutes

Chair Ken Kimball opened the meeting and requested a motion to accept the meeting minutes of the March 13, 2006 meeting.

- *A motion was made and seconded to accept the meeting minutes of the March 13, 2006 meeting as presented, seconded the motion, there was no discussion and the vote was unanimous to accept the minutes of March 13, 2006.*

9:45 – 10:15 UNH – Final Draft Proposed Souhegan PISF

Tom Ballestero

First - Wayne – We are close to going public. The TRC has looked at this draft a time and a half. We do have a new version of the Executive Summary and what we are looking at is going from these draft versions and getting it approved within the TRC so that we can take it to the public hearing. The public hearing process requires a 30 day review period before it goes to the public hearing. We need to have public versions on electronic and paper copies. We need to find out where those paper copies should be within the watershed. We plan to have a copy here at DES. We should distribute copies at various locations so they are easily available for people who want to review them. One place would be the Milford Library and potentially several other libraries within the watershed. Let's think about that this morning and have a decision by the end of the meeting as far as how many copies should be out in the watershed in hardcopy. The final proposed Souhegan PISF draft is over 800 pages. The Executive Summary which at this point is 12 pages and is the results of those 800 pages. Wayne will make paper copies and we will be presenting the Executive Summary at the Public Hearing.

Wayne's questions are:

- *how many hard copies need to go out; and*
- *to what locations*

It will also be broken down into chunks on the UNH and the DES web sites. The other question is:

- *Do people feel they have had enough time to review the document as it stands now, and can we within the next week get all of our final comments back?*

There have been no changes in the Appendices, some changes in the text and obviously the Executive Summary has had the biggest changes. It has gone from 2 pages to 12 pages. Can we find a date when this final comment period for the TRC is complete so we can set the schedule for the public hearing?

Tom Ballestero – To expand on Wayne's comment before I go into the presentation, the March copy of the proposed Instream Flows was to give you a flavor of what was to come. It wasn't complete at that time. Basically nothing has changed since May, the only difference between the Report as it stands now and what we had in May is that we have added more figures that describe what is in the text. The main body is a little over 100 pages of the report. Most of the report is appendices which is where all the science is, how we based the flows. To underscore the comments that Wayne has made, we really need your input, the whole process revolves around your input. Until we can get this report out on the streets and get the public comment, really the water management plan is held hostage. We have to have the instream flows finalized before we can talk about what management strategies we can use. Until that time it is nebulous, it is not concrete. We are moving on the water management plan but we need to find the next footstep.

The following questions were answered by the Normandeau/UNH/UMA Team: (All questions and comments are indented without names as the information on my laptop was lost and the Normandeau/UNH/UMA Team's responses and staff responses are back out to the margin.)

Questions: Are all the appendices on both the UNH site and DES? **Yes.** I don't think I had the appendices version on my site I had the recent May version of the text. **They are definitely on the...** I couldn't get them from UNH site the other day and didn't see them on the DES site so that is why I asked.

All but three or four appendices are contained with the name of the report on the UNH site and then there are three or four appendices (11, 15 and 16) are separate appendices because of size and format. They should all be pdfs. They were all there last night but if you are having trouble send me an email today, I will try to send it to you using a share-ware-servers.

Wayne will make sure he has the whole report broken down so it is easier to download on the DES website.

All of the information that Tom presented at this meeting is the same information the group has seen in the last 4 or 5 meetings. Tom waltzed through the first 5 tasks to refresh everyone's memories and then go over some of the figures that were pulled together since the last meeting. This is the meeting where everyone needs to be rolling up their sleeves and giving us back comments. If we don't get them now, at least written comments in the near future so we can finalize this, DES has given us very thorough comments and we have just finished with those. We are up to draft 17 of this report. Tom went through his PowerPoint presentation that will be on UNH's website in two days.

It was our decision ***and again you need to comment on this*** that human needs have developed on this river system as run-of-river whether it is pollution abatement, hydropower or recreation. When the river gets high enough that is when those IPUOCRs can take advantage of the high flows. We felt the human needs would not be included in these synthesized IPUOCRs for two reasons. One was the historical entities were met by the natural flow of the river and secondly if we really wanted to meet those we don't have the storage to do it.

Question: You said something like there are not a lot of withdrawals in the upper Souhegan, does that also mean that it is not impacted from the habitat or fish perspective. **Impacted by what? There are impacts.** I was thinking of alteration of biology.

When we move to the management plan by regulatory dictate, we are supposed to be looking at flows. As an example, there is absolutely no withdrawal upstream and this is how the instream flows compare to the hydrographs, 50% of the time in that time period we are not meeting it and that is natural. Now are there impacts? One huge impact in the river system is temperature and restoration can ameliorate that. If you had the ability to add flows, you are making life better. Right now there are other impacts, one is temperature and the other is woody debris. The upper reach could use more wooded debris.

Comment - If there was some way you could quantify x amount of restoration is going to reduce those lines by x numbers so that the management plan can look at that as an option. What I saw in the report and I may have missed a lot of stuff, but it seems like they need more concrete numbers to decide how much we invest in restoration versus more control of water use.

This would require much more detail, a thorough analysis and simulation to be able to answer any questions about how much money you would need to invest. This is beyond the scope of what we are actually required to do here. Around pages 70-90 in the report there are similar tables with habitat area that you will get with the flows with stream restoration and you can compare those tables to the habitat areas of the existing system to see the differences. There is a section on stream restoration.

When we get to the management plan, just using this as an example, if one user is told the river is down here at this time of the year and you are just going to have to stop taking water maybe for a week or two. That entity not being able to take water for two weeks, that is the end of everything whether it is a town for drinking water supply or a private industry. If they knew that they would have to make this decision a year or two earlier where they would either have to stop taking water or if there was something else they could do. BIA years ago at one of their meetings, their thought was in the future we are all going to have to be building these enormous off channel storages. However, maybe for a much less investment, stream restoration might be an alternative. All of a sudden this looks much more attractive to them. As far as costs go, in New Hampshire it is the NH Stream Team, in Pennsylvania it is the Keystone Stream

Team. In Pennsylvania they have a database and they have identified some average costs for stream restoration averages. The danger of using that is it lumps 6 order streams with one order streams. It is tough to say the average means something.

Tom, the thing I grapple with is that there is a slippery slope to that comment, if you had a chemical toxin that eliminated all life out there, your rationale could be that zero cfs actually functions, and until you solve the toxin problem, the water flow issue is really irrelevant up to that point. The same is true to some extent with the temperature. So what we do is create a rationale for a lower flow based on a man-caused limiting factor but if we fixed that man-caused limiting factor then we would actually have a need for a higher minimum flow. This system is already stressed by two man-caused factors you end up with a result that suggests that lower minimum flow is okay. We could be moving in the direction of saying lets fix that problem but still keep the flow lower whereas in reality if we fix the temperature and wooded debris and we move the flow up then we could get that much more relative to the IPUOCRs that we are talking about.

I understand what you are saying but unfortunately again, we are only charged with looking at it based on flow. The answers we give are flow answers. The other information we are throwing out of this is we have these other two elephants that we need to talk about. One is the temperature and the other restoration.

These criteria here are based on the system that is not stressed. What we are saying if we would improve the system that less water would provide the same amount of habitat. The real value of restoration is to provide a situation where the restoration improves habitat enough so that water that is in the river can be used for off stream uses and there is more water available.

If you fix the temperature problem, does more flow give you more habitat?

Yes, it does.

Then that is where your stand should be. And at least know what you are trading off. The very low flows are being caused by these other anthropogenic stresses.

That is right because one of our conclusions is that at least in the upper river, fauna is not absolutely happy and not impacted. We have very low densities and we have several species missing. Yes I agree that there is a need for improvement before we can actually talk about getting more out of the system.

I realize we are not going to get perfection, but the thing is you also don't want to be at the other extreme where you have serious other threats so you create an extremely low bar and over time if you fix those other stresses you are caught with that low bar, because society has got addicted to those values down there.

To the extent that restoration ends up on the management plan, as a guy who spends a good chunk of his time working on restoration and looking for funds to do that kind of work, I am certainly in favor of using that approach as a management tool, that said, one thing that certainly jumps out over the course of the last years with respect to restoration or habitat enhancement is that there is a real difference between habitat enhancement and habitat restoration. It would be really important to understand what the habitat ought to look like, how many pieces of woody debris should be in the stream, what the riparian forests ought to look like, how is that affecting stream temperatures rather than in the situation where we have a management plan that is basically using dollars that might be used to build off stream storage to build structures or other unnatural habitat in the stream purely for the purpose of increasing the amount of habitat availability. I am just pointing out that in my mind there is an important distinction between the two and something that really needs to be taken into consideration before we get our management plans.

The question I had is relative to the woody debris issue, so there is not enough woody debris now, is what we are hearing, let us wait 50 years and not touch the riparian zone, let us wait a 100 years, would there be enough woody debris? So if there is something wrong with the riparian zone that it will not provide woody debris? I don't want to just put a band aid on something long term. If the riparian zone is functioning as it should be, then I consider the riparian zone fish habitat. You cannot separate the two. Will it happen on its own without our hands or our dollars?

There are studies in Britain and other places about reforestation of completely modified landscape and these studies point in the direction that it does not necessarily go back to what it was because there may be some specific elements missing in the system. We were just wondering now when we were making these final edits about potential logging activities in this area, how many old boulders have been destroyed and blown away. It is very likely that if you would just let it be, the system will never come back or would never get to the point that would provide sustainable habitat. It needs to be investigated in more detail.

Wayne – This is a whole other topic beyond what we are trying to do here. As much as I would love to go into that, it is not what we are trying to do here.

I am concerned that when the management team planning folks get a hold of it, it might be looked at as a panacea for low flows. I am concerned that without some more flushing out of the basic concepts...

Wayne – I don't think anybody is going to give that, it is not a cart blanch where you say you go in and throw a couple of boulders and plant a few trees that you are going to get more than 20 cfs out of a river, that is not going to happen.

I just worry how the public is going to respond to this idea without understanding it.

Wayne – It is a very complicated issue and I am a little concerned myself about the potential confusion that might arise.

The more trees you plant in effect at times are going to take more water out of the river aren't you because trees just use it? Nobody has studied that part of it right?

Paul – I think is further ground for discussion but for a practical point of view at least in the regulatory context, flow is independent of temperature, is independent of riparian zone integrity. All of those things, and there are some others too, are all part of the water quality standards process but they are considered independent. Obviously they are not but from a simplistic point of view and from the point of view of this study they are until we flush out the discussions and identify. The management plan is going to talk about flow and is going to assume status quo as far as temperature, status quo as far as woody debris, riparian zone, pre-cover and anything else that you might think about.

I have a flow question. I was wondering if you looked at the period of record in terms of event exceedences as opposed to daily flow exceedences where a number of events with three days, consecutive days, at or below trifold 7 day/10 day to get a sense of how often you get this correlation of low flow sequences that really are a critical issue here in terms of stress on the biota.

For this report that we are talking about right now, we did exactly what you asked. The statistics are presented in tables around page 100 for each of the IPUOCRs. What we are doing now as we move into the water management plan, is we are taking the century of record, mapping this over it, and we are looking at the statistics per year. In the next report we want a management support to have a full 100 years. For this report we did what we were told to do and we did the specific hydrographs. We agreed to do the 100 years, why we wanted to do that was when we looked at those three hydrographs we selected, the wet three years actually had lower low flows than the average even though it was a wet year and had much more water when you look at the three year period. Statistically taking snippets, you

may get biased snippets and so why not look at all the data you have at your fingertips so that question will be answered. In fact we just went over it in detail yesterday with the person who is going to be working with it. It is called the Run-Length Statistics. It is the same analysis used for draughts. All we can do is say is it happening on the upper and lower or is it just in the upper.

When I read through the executive summary I was trying to decipher what I interpreted was this definition here based on habitat of the low flow conditions. When I take a look at from March to May it can very easily be interpreted that all water here could be cut off and stored for other practical purposes and yet it is those kind of flows that meet some of the wetland needs are the tracked flows for spawning and so on and so forth, and I didn't sense any guidance about how to protect those things. In fact, I would say as a reader that my first interpretation is that water is there to be taken.

Maybe that is text we should add because this is a point we have all discussed. As far wetlands, the wetlands I have separated from when the wetlands need to be filled.

The support is there but I never felt the language.

Two things; first these high closed are needed to maintain some of the high energy. Secondly, channel forms may only last for less than a day. If you look at the bank full flow on this recent event, on the Souhegan this recent event covered a ten year flow, which is the kind of flow you need for these high energy returns. The point we're making is that is what we call articulating in water management plan. In this report I think all we say is there is the potential here.

To me that is part of the protection instream flow. Most closed systems just continue to ignore that.

Just a quick comment, we're dealing with that on a couple of small watersheds on the seacoast in developing some tools to basically estimate what the limitations are on skimming high flow based on hydrograph maintenance.

So my comment really is that we need something to hold all the water together that protects the balance that otherwise we could see a lot of political usage.

If it is okay, we can certainly put in a lot, but for this report I think just articulating what we said, it doesn't necessarily mean that it is all available for use. There are other uses for this, but where we are really going to address it is in the water management plan. Let's say you went from the assumption that this was all going to be used and put into storage up stream. Lee is going to say that there is no way you can do that because the sycamore forest needs that and Wayne has raised this point that geomorphically we need these flows.

Question - Low flows and when you get a pulse, I remember thinking that I needed more of a handle for myself on how long does that pulse need to happen in order to recover, and then go back into low flows and is there any guidance on that?

From our analysis we have, and we have done in the past, provided the length of the pulses that would be necessary, usually in a day or two.

I guess from the standpoint of a protected instream flow, if you're going to allow flow to go below but then pulse to recover, it seems like the numbers need to be in this report as a requirement.

No, I considered that to be more a part of the management plan, then you can start work with the different scenarios. My more important task here was to win you for the idea alone that duration matters, and that the pulses would be a good idea.

This is something that will probably be a construct of what we originally envisioned as minimum flows, or protected flows, have been more or less a single line. When we do look into this natural flow paradigm, we've started moving into multiple magnitudes of flow, durations, frequencies, protections of things on a different type of scale. Originally when we thought about this, it was also something you could write down and give a single value for in the protected flow; and now what we are talking about is a protected flow that incorporates all these different components: the magnitude, the duration, the frequency, the time and all that stuff. So, in a sense you are right, but it becomes part of both the management and the protection plan. One thing we used to think of as being solidly ensconced in the protected instream flow is now also partly into the water management plan where you're trying to make decisions about how you manage to protect these levels, these magnitudes, by pulsing with certain durations. We started to kind of re-blend something that really shouldn't be blended, which are the flow protection and the water management plan. Unfortunately in our construct of scope of work, we said here's the protected flow and you would have an answer, and then we need to have a water management plan that was based on that. Part of this is inherent in the change of perceptions of how we define protected flows. I agree you are right, in a lot of this stuff it would be nice if we knew what the water management plan was so we could add those numbers into the corrected instream flow numbers, but unfortunately we have to do one and then the other to go through this process.

You can't necessarily equate a release in cfs to how much water you are going to see in the channel downstream of this. There is a type called bank storage that intervenes there that can accommodate a significant volume of water which will then be released very slowly over time. Your pulse may end up not being felt as such at some distance downstream, it may just be a trickle. It's not as simple as releasing x cfs of water and receiving it at some desired point down the stream. You may have to release a lot more water upstream in order to see the desired effect downstream.

In fact there was a little experiment DES did a few years ago on the Lamprey River to see just that kind of thing and the pulse didn't show up on the gauge.

He was talking about having a description as to how much water should be, or how long should the pulse last, in a particular location regardless of where it comes from.

Assuming that we could do this, how long will it last?

If you had all the water in the world, for how long should it last? I agree with the point, but I would think that it is more something, once we decide to go to drought it all it's more complicated, I would suggest you would incorporate into management plan.

It doesn't matter too much where it exists, just for my comfort level.

I take the position that it does matter, and to explain where I am coming from and that is when you get into the management, I don't think it will be an issue so much on this river but may definitely be so for other rivers, the argument is going to be about whether you have 1 day, 3 days, 5 days, 15 days, or 30 days. The concept when this was all put together is that you would try to answer those questions in advance science and then go over to the management plan. And then you move the science over to the management plan, then there is an interplay that goes on that needs the science to get bastardized to meet the societal pressures. That is why I personally believe that some description of that in the science part is necessary to protect you from the discretions of the management part. In other words I think we are going to get caught in the middle of the game

I agree with that completely, I think you might have been saying that, but just to be clear, I think it is really important because that is the strength and sort of beauty of the New Hampshire coaches and you do try to keep the science as clean as you can before you get into the management plan.

I just have a comment that perhaps we need another category to address Ken's concern, we have low flow lines here, maybe we need a high flow line in the springtime to address Ken's concern that we do need high flows on occasion for a whole variety of things. Maybe there is some kind of a dashed line that we could place in there that would suggest that we need an event, we don't care when within this window we get it, but we need it. That would indicate that water was not generally available.

It's compound by the duration and the frequency but at the same time, I take a look at medical drugs that go out. The broad population responds differently to medical drugs, but you still reduce it down to some simple parameters that the doctor uses when they prescribe it. Essentially that is the same task we have here is to try to get those cases of duration and frequency that are being proposed to meet the biological needs out there and not worry about perfection so much.

One thought that I had in terms of simplification, I started thinking about pulses. We determined the different levels of pulses, we had first pulse, being smaller, and then the second pulse had to be higher, followed by a smaller pulse. This is getting more and more complicated.

We need to try to come up with a description that you have all these complexities but at the same time you are reducing it back down to something that is functional.

What I have seen in some places is statements of every one to three years you need to fill out a support list of ice structure which becomes a role that you maintain. If that year is the final year and you don't have it, you can't skim off the map until it reaches that point until you are on the receiving end of that and accomplished that.

I'm sorry; I was talking about pulsing throughout the duration of both.

Just a quick note on the flood controlled dams and how they have eliminated those peaks. Possibly by utilizing the flood controlled dams for storage, you'll also have facility to encourage peaks.

We are working with the Dam Bureau to try to organize our own processes within our own flood controls systems. We are working with our own flood control dams to evaluate how we can modify them and what structural changes will need to be worked on.

I do think there is value to establishing some kind of protected instream flow on the high ends and I'm not sure as to what size, event, or what kind frequency, but something that is going to assure that once every year or 3 years or 10 years there is a pulse that comes through the system at the high end and provides an over-bank channel forming flow. ***That should actually be written in with the rest of the protected flows.*** I'm not making a recommendation as to what that number is, but I do think there is real value there. I think that is a way to go beyond what Ken is talking about with respect to having something along those lines in the narrative. The science supports it that there is ecologically and that's an important component on the system and while the passing may not exist on this particular stream at this point in time to skim to that level, I think it is important.

This is the pilot program, we want to make sure that we cover this when it jumps from this to another.

You explicitly said that you're paying attention to the natural flow paradigm and I think that context has to go throughout the entire report, which to me means that with everything everyone said about high flow is being part of.

The yardstick being kicked around the NH Stream Team has been looking at bank flows events and what may be the channel forming discharges. We already have 2 high flow criteria and it is for an abbreviated period of the year. The NH Stream Team seems to be about the 1½ year event.

I'd be careful about just limiting it to that because if you just say that is all we need you don't have that over bank.

No, I didn't say that's all we need. I'm saying that when it flows above that, that's when you wouldn't want to skim. When the flow is below that you're not filling oxbows, you're not moving sediment. That's you're best opportunity to skim because now you are not at a depth detriment to the things you mentioned.

If it gets above that, then you don't skim for x number of days, and then beyond that you could then skim. So that would be something you flush out in a very short paragraph.

Maybe there is a slot in there, if it gets just to that point it starts doing some of those functions that are just over that bank hold stage. At some point when it gets to be a hundred year flow, as far as I am concerned take all you want if you can find storage keep it.

Again that only happens once in a hundred years.

There may be a number smaller than that maybe it is a 10 year storm or a 5 year storm, where if you could find the storage somewhere, go ahead and grab as much water as you want. At some point we may not need all of that water either. There is a critical slot where it is just over bank fold, certainly channel forming.

I understand everything you are saying. If we had perfect knowledge of the future and every flow of every day, we could do what you say. The reality is we don't know that this is going to happen. We have to be prepared if we are going to be managing this system to have the water in storage already. Let's say it is the 10 year event and so you can take the water, well that is only once every ten years on the average. We have to do this every year if we are going to manage this system to be prepared that this is going to happen every year. Remember one of the slides showed that 50% of the time we don't meet it. Every year you have to be prepared. In the theory of storage there are 3 types of reservoirs for conservation storage. There is the provider, seasonal storage, every year you have to fill up, and every year use that water. There is the provider over year storage, and there is the provider inverse regulation, that is when it is flooding those reservoirs can shut the gates and create drought down stream. For as large as it is, Winnepesaukee is only seasonal storage, we have a 14" pool to work with on Winnepesaukee for 72 sq. miles. On this river system, to provide seasonal storage, you need about 40,000 acres, and it's not there. My point is, this is management, the storage that we are talking about using is very small, and it has to be filled every year. You don't have the luxury of knowing the future.

I'm not talking about the storage side of the equation. I'm talking about the withdrawal side of the equation, and basically setting up some kind of window where it says, maybe it's only the 1.5 year storm and maybe what you say is once every 5 years that has to happen, or once every 3 years. You don't necessarily have to have it quite as often as natural.

Filling the storage or the event?

It's insuring that the event is allowed to occur, that the diversion doesn't prevent that event from occurring.

I think this is getting blown out of the water. The flows we're talking about in the river are thousands of scale, and the diversions are in the tens. It's within the order of accuracy of the gate.

I don't disagree on this river they know that this is a pilot study. There are other rivers where this is an issue. Basically, we are trying to develop a system that can export it to the other rivers. I think the beauty of this one is that you can develop it without the political pressures because you don't

have them here, and then you can transplant it over. I think if we were trying to do this on a river system that already had political issues that it would be problematic to developing the right model.

What I'm hearing is that we are going to have some type of recommendation. The system needs to see that. Unfortunately, we have no way of predicting that. We knew 2 days before Mother's Day we were going to get what we got, that's the difficulty of prescribing something like this. We can certainly say, here's the window and we can skim, and once it gets higher than that, we can or we can't skim.

What might work is to create a slot in there that says when flows are between the 1.5 discharge and the 5 year discharge, you can't skim.

Or 4 or 5 days you can't skim.

That is what I said about twenty minutes ago. You skim below the 1.5 year...

But my point was we actually create a slot above the 5 year storm or the 10 year storm where you can go ahead and skim again. It's not that you can't skim at all above the 1.5 it's that there is a slot in there where it's just above that threshold but at some point above that it is no longer really a concern anymore.

We are at the end that was the last slide. Two other points were, we've identified the stream restoration might be feasible in certain reaches and that temperatures will need to be addressed. We are focusing on other issues but those are significant issues.

- **Ken Kimball** – I would like to keep the technical questions going for the next 15 minutes and leave ourselves the last 15 minutes to answer any questions that Wayne threw out in the beginning.

I think my main point at this time is the translation of the information to make it useful and Tom thank you for this presentation. You did a great job of summarizing where we are right now with the science. I didn't have that understanding after reading the Executive Summary untold times. I think that is what I am going to focus on and that is how to make the Executive Summary, which I believe is the most important piece here, because that is a chapter that most people are going to read and stop. That is what a lot of managers are going to read and stop because they do not have the technical background. That has to be the translation and the justification for the answers. I have a long list of comments that I will submit in writing. Political and for the WMPAAC's use that has to be right before it goes to public review. As a Technical Committee I know the Executive Summary is confusing and hard to understand and despite the fact that there have been a lot of these meetings, it just didn't do it for me. I am flogging, very generally, but you and Wayne will see specifics.

The first version from an instream flow policy died in a large part because of the criticisms of not being able to understand it. I am not sure the results are all that different. I don't think the supporting evidence was any where near as good as this, but I am not sure the results were all that different. There was a slightly different tack. If I was a water user and not a water scientist and I read this thing and was just trying to figure out from a business perspective of where do I fit in, how do I figure this out without having to hiring a consulting company to figure it for me, to me that is the acid test because if politically you get a lot of people coming in saying they don't understand it, it is probably going to die a political death.

Currently the report and the Executive Summary read like a laundry list of work that was got rather than a cogent justification for a result. The report and appendices can stay in that format it is that conclusions need to be clearly stated and easy to find, and depicted in a way in the Executive Summary that the answers are easy to find. I couldn't find them in the current format.

There is a fine difference between dumbing it down and making it functional.

I wouldn't say simplify is what I want, I think it is finding that balance where the rigor is maintained but it is language that anyone can understand.

I have gone through this report on three different occasions mostly when each draft was sent out and I have had the same sort of reaction. I think I am the only person on the committee here that doesn't understand what this report is all about. I have had a terrible time getting my arms around it. I am not sure that I am a great deal further ahead now than when I started a couple of months ago. One of the issues that jumps out at me is I don't see that the report connects very well. For instance on page 2 of this Executive Summary, you make a statement that common flow can be found as the most common, frequently occurring habitat and that fish exist in the most optimum habitat conditions. When I go in and look at the rating curves on page 56, I cannot make heads or tails out of it. I don't see how you could come up with optimum habitat with those rating curves. There are all sorts of questions about a very low in the rating curve. Fluvial species sometimes added to the maximum habitat to the water at a very straight line intercepted back to the zero. You have essentially the highest habitat or optimal habitat at zero flow for fluvial species. You have fluvial species that are showing to be non-responsive to flow, but there are habitat generalists that are showing an increase in habitat with an increase in flow. There are a number of questions that I am scratching my head about. Then I start looking at how you are coming up with technical flows. It doesn't seem like the results of the flow studies are determining what the protected flows are. It seems like you have done the flow studies for that information and then you have gotten the hydrologic analysis. Within the hydrologic analysis it seems like that is where the flows are going to be depicted off from that. I cannot make the connection between the flow study that was done and the hydrology that was done. That disconnect there is where I have struggled and struggled. I cannot see how you can go from A to B with this report. I cannot understand why fluvial species are not responsive to flow through the great lane and in making that curve such as the salmon spawning curve typically you expect the optimum and you have a curved line out and it starts at one but it is not projected up, apparently there is no means to project up to 2 cfs flow to see where the top of that curve is which is where the optimum habitat would be. I cannot find the optimum habitat on those curves. Those are my difficulties at the moment.

We will try to arrange the text so that it will be a little clearer but because of the volume of our work it is hard to pick up all the details which are in the appendices. An important part of what we have done in this study was compared to other studies and we used their combination of optimal and suitable habitat. So we have two levels of useable habitat was suitable and optimal habitat and the results of the study are a product of both. The common habitat is equivalent to the optimum habitat, it is not necessary, it is something that is common that is providing good survival conditions, it is not necessarily optimal habitat. If you wanted to provide optimal habitat for every individual species you would get five different answers because what is optimal for one species is not necessarily optimal for another species. We have to create some tradeoffs in the frequency of duration signals that are given to us from the analysis. I didn't understand your comment about disconnect between the flow study and hydrological study? What is flow study with hydrological study?

We can take rating curves and looking at that data I couldn't find where there was evidence from the flows from these curves. It seems like the individual flows were as good as I can determine derived through the hydrologic analysis.

It is a combination of both. Rating curves, you are not picking up the protected instream flows in the rating curves alone you pick it up from the cut curves which are a combination of both of frequency duration and habitat availability so it is much more complex. Protected instream flows do not necessarily recommend optimal flows. In this case if we would be doing it, we would be farming salmon or providing the optimal habitat for some species instead of trying to mimic natural habitat regime, rating curve habitat regimes.

I think this gets that issue of complexity and that is going back to the fact that this is a pilot study and we will be using the lessons of this work on other rivers, Lamprey being the first one. I think it would be useful for DES and for us as a group to identify those pieces of the Souhegan study if there are any that aren't necessary to get us to the final answer. Are there pieces of work that could be reduced or eliminated from an additional study so that we are not expecting that we will be spending the same amount of resources at every river to identify instream flows, and maybe not needing to get to a level of complexity that is confusing? I am not saying the science wasn't good and the detail isn't good, I thought it was fascinating and interesting study, but I think that there is a role for this pilot study to inform how much science is required in future studies.

This is very frustrating because everybody wants to have a thorough analysis of a very complex system on one hand. Once they see this very thorough analysis, they say wait, this is way too complicated, let's just get to the point that is what we need.

Our role as the technical committee, one of the filters that we have to employ, I believe, is to challenge the scientists on this very point.

We can do it only through the process of learning.

What is the result of this learning, to inform the Lamprey and all...?

This is where I go back to the analogies of speeding limits. On the road you have a variety of different vehicles that drive safer at different speeds. You have a variety of different types of drivers and experience, etc. Society whittles it down to a functional tool, and there is a chunk of science that was used to get yourself down to those numbers. It rains some days and it snows some days. We have 55, 65, 75 and when you get down to those numbers we don't get all hung up again in all the complexity. We use the complexity to come down to that number. We are seeing the same thing here. We need to use that complexity to get down to the functional numbers so that whether you are a highway Pullman or whether your lane here that is trying to implement this or whether you are John Q Public that is trying to come back and see us. I don't want to know that at 6 AM I can drive at 55 and at 8 AM I can drive at 65.7 and at noon I can drive at 45. We go through these things many times in society and that is essentially what we are trying to say here. Yes there is the complexity but there is also the functionality.

This, now that I am getting comfortable with it, is useful. It needs to be translated so that anyone can consider it useful. But other pieces that we have learned are not necessary to get there.

I haven't paid a whole lot of attention to the body of the report. I have read the Executive Summary and I haven't spent a lot of time with it. What I came away with is those graphs, what your doing is your saying is the river can spend a certain amount of time below each one of those and it gets less as you go down to the critical flow. What the management plan is going to do is play the odds based on the history. Now that is understandable to me and I think I could convey that to somebody, a water user or a dam owner but it is going to be involved in playing the odds. That is what I got out of it, is that what you intended to get out of it? There is an element of probability here that everybody is going to have to live with and somehow that has to get annotated but it is time, flow and duration continues under threshold.

I am not sure if we should jump into Doug's suggestion yet, we know the Lamprey is already absorbing some of the lessons learned from the Souhegan, but I think that one case study does not mean that we should automatically decide what the useless steps are at this point. I think that the results of this whole pilot program with both rivers and their resulting studies will give us a strong indication of things that we probably don't need to spend a lot of time evaluating. From the recreational information from the Souhegan we recognize that we are probably not going to maintain year round cfs. So there is probably not a whole lot of reason to do anything other than allow recreational users to take advantage of the

natural occurring flows and try not to impinge upon that anymore than we have to. Maybe we don't need to go out on the river and do a recreational survey. That kind of stuff is already coming out of the process and I think more things like that certainly would be of value in this process in focusing us on what is really important. The process of actually doing that is required in order for us to satisfy every body's concern that what we told everyone was that we are going to do detailed study for every IPUOCR on the list and I think we do have to do that until people recognize it is not needed.

With all due respect as I said we cannot build a house without creating a foundation and that is what we are doing, we are creating a foundation. But to use a technical comedy, need to be expected to be challenged on following through all the processes that we have done. You have to digest it with us together and we will be happy to discuss, explain and correct so it is easier to understand but also to understand that the volume of the work alone is creating a challenge for everybody. It took us a very long time to understand all of this.

We have made light years of progress here and the fact that we are nit-picking, and some of us have been through this experience once before and watched it fail twice, and we would like to see this one not fall into some of the traps there. I think you and Vern should have an on-channel discussion.

I have been trying to follow and there are things you said today that I didn't understand until I heard from you that you used as part of your analysis, the optimal flows, and one thing that might be useful is to pick something like the common flow in one of the sections for rearing and growth and just sought of step, if this was a traditional IFIM and I wanted to, I could go back in time and go through depth and figure out why a flow was being recommended and for a particular reason. That is harder to do here in part because your approaches are more complex. Pick a flow that is of interest to us and just in a couple of pages explain how you use some of the Connecticut data, to come up with the habitat suitability, etc. From someone who has been participating in following this, if I had to explain it to someone I would have a hard time. I think the report too ought to help in that regards.

I think we are talking more about presentation.

I am looking forward to the management plan, my understanding of what the management plan is likely to look like is that based on forecast of likely durations of under threshold events, either there is going to be releases or there is going to be turned down for turn offs of the water users and there is going to be criteria to decide when you do those. Once you have done them, we as regulators are going to have to live with that and understand that is the nature of the beast.

I really want to understand what is going on with recreation it seemed to me as we were talking about having some slot for channelization flows, would there also be a potential for a slot for white water that could be worked out the same way, is that appropriate, is it needed. I haven't thought this through nearly enough to wrap my hands around it. It seems like just to say, white water boaters are going to opportunistic is not entirely satisfying from a recreation standpoint.

Unregulated systems such as this, I personally believe that is the scenario. If I interpreted correctly what they put out here is that basically what the report is saying that in an unregulated system these kinds of opportunities are going to be provided in an unregulated method. When we get on to certain rivers such as the Kennebec where you have a highly regulated system then your recreational flows are fully operational.

I understand that but I don't necessarily agree with that.

The thing that I think was missing here which is the point I was trying to bring up earlier is that even though the high flows for boating are going to be left to the whims of mother nature, there was no

description about how the high flows could even in an unregulated system would be protected and that was one comment early on in the review.

You have no releases on the Souhegan it is run-of-river.

I understand that, what I was saying is if you are allowing use to take x amount of the water in any given year, how many years are you going to eliminate white water boating because of that, and it may not be an issue at all, but I just wanted to raise that question. It may not be an issue now but in the future it could become an issue especially if you got more storage and more water users.

I assume that you would do it by running the water down the river, depending on where it is running down, you would have white water canoeing.

There is no problem with leaving white water to nature so long as nature was not in trouble.

Ken – I want to thank the group for the problems that I think will always be coming from a technical group like this. Our job is to find what is wrong, not what is right. Speaking from myself, but I think I have heard this general comment from around the room, most people are very impressed with the quantity and quality of the work and the detail that you have put in. I think we are all struggling with how you synthesize that down so that DES can actually use this on the ground and part of that is just based on experience of twice coming up with relatively complicated processes that suffered along in the past.

Tom – My thought for the Management Plan is that you are using this and in the background you have the daily flows. The idea is to use this just like the security threat level. You have two, three or four levels of warning. For example, when the flow does go below the first level and we need to watch the flow every day and there is a duration associated with this one, but there are shorter durations associated with the higher the number. We are trying to make it so it is easy to use and not get any more gray hairs than we have.

Ken – Wayne introduced a series of questions here and there are a finite number of times we can also just in fairness to the size of the contract, we can go back for iterations 7, 8, 9 and 10. We also have a time schedule that we have to meet relative to reporting back to the General Court, so we have to keep these things in mind as well. Wayne, why don't you go back to your questions as I didn't commit all of them to memory and let us take a go at them as a committee?

Wayne – It sounds like there is some need for Piotr and Vern to have some internal discussions, but beyond that can we within the next 7 days, say by next Tuesday, have submitted all comments that are relative to this most recent version of the Executive Summary and instead of comments on the appendices or the report as a whole, is that a reasonable time for reviewing the parts of this process, essentially those 12 pages of the Executive Summary. We have had this out for awhile and I know some people already have their comments written down. If everyone can have their written comments in to Wayne and he will transmit them instantaneously to Tom and all of his people on or before **Tuesday, June 13, 2006** which will allow us to have a finalized version in a week or so that we can put out to the public.

Report Distribution:

The full report put on CDs broken down by the Table of Contents and a copy of the CD to each WMPAAC member, TRC member, RMAC member, 5 designated river towns, plus one hard copy of the report and the appendices at each of the 5 town libraries and a half dozen copies of the Executive Summary. We will rely on the libraries, the web sites and the distribution to the TRC, WMPAAC and RMAC to be the structure for getting this out into the hands of the public.

Wayne- my expectation is that Milford is the centrally located town and the ideal place to have the public hearing. I expect we will hold it at the Town Hall in Milford. The date could theoretically be the end of July if we can get this out into the public sometime before the end of June. The schedule would be:

- 1) We have everyone's comments by Tuesday, June 13, 2006.
- 2) Final revisions done by the end of that week.
- 3) Start distributing them the following week so the public has 30 days to review.
- 4) We could have the public hearing sometime within the last two weeks of July.

11:30 Other Business

No other business and the meeting was adjourned.

11:30 Meeting adjourned.