

CLAYTOR PROJECT NO. 739
APPLICATION FOR NEW LICENSE

STUDY PLANS UPDATE MEETING
CLAYTOR PROJECT NO. 739

MAY 17, 2007

DAY TWO

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The following STUDY PLANS UPDATE MEETING came on to be heard on this the 17th day of May, 2007 at the AEP Pulaski Service Center, Pulaski, Virginia.

Introduction

TERESA ROGERS: Good morning, I'm Teresa Rogers. There's a lot of people here from yesterday but I wanted to just briefly update everybody so we're all on the same page going into this meeting today.

This is a study update meeting. Its purpose is to provide some information on where the consultants are to date and also answer any questions that you may have. I won't go through the whole long list of the activities we've had to date but we actually started this process back in 2005 with some pre filing stakeholder meetings.

The last time we met together as one big group was in January when we had the kickoff meeting to introduce you to the consultants and kind of let you know what was going to be going on this year as far as studies.

The approved studies for relicensing includes aquatic resources assessment, cultural resources, debris, erosion, fish entrainment and impingement, instream flow needs at reservoir

elevation, native and exotic aquatic vegetation, navigation systems, recreation and angler use, sedimentation, water quality and wetlands riparian, woody debris, littoral and bald eagle habitat.

Today=s purpose of this meeting is to just update you on where we are in the study progress. The consultants will be here to give you an idea of what=s been going on in the field to date, what information they=ve gathered to date and then I=m going to also give you the upcoming dates that you need to be aware of in the process plan.

Yesterday we reviewed aerial mapping and bathymetry. The bathymetry should be done by the end of March so it=s getting there. Sedimentation and erosion was reviewed, water quality, debris study, fish entrainment and impingement and habitat and aquatic vegetation.

Today we=ll be reviewing cultural resources, instream flow needs, aquatic resources, recreation and angler use, navigation and shoreline management workgroup. I=ll give you an update on where we stand there.

We are in the first season of studies, the consultants have began their work out in the field. We will be having workgroup meetings at different times this year as we need them.

If the consultants are out in the field and they see that something needs to be modified so that the study will be more meaningful or give the information that we need I'll be sending out emails. There may be meetings to discuss those proposed changes and make sure everybody is in agreement before we change anything.

I do a lot of consultation through emails. We may have some conference calls but I will try to give you as much notice as possible. The next time we meet as a big group will be in November and this is for the initial study report meeting. Prior to that we're actually going to be filing with the Commission an initial study report.

You'll get it first, before the meeting rather, so you'll have time to review what's been going on to date and then we'll meet together and if you have any questions or whatever at those time. This is also the opportunity to comment on the studies to the FERC once we have this meeting.

Now the studies will not be done at that time so you're not going to see a study report with all the findings because the studies are still ongoing, but it will give you -- it will be like this but just more information.

We'll have to file with the Commission a meeting

summary and then any study planned modifications that have been determined if necessary by December 17 and then participants, that=s all stakeholders, will have to file their comments on the meeting summary by January 16. We will reply to those comments back to the Commission and the Commission will issue study plan determination.

Now all these dates are on this process plan, that=s why I bring them to every single meeting because these are the deadlines that you will have to meet. So everybody can be aware of them. The other thing I wanted to make sure we=re all kind of clear on because there was some confusion yesterday, the study reports themselves when they=re issued they may contain some recommendations of course but they won=t necessarily contain what Appalachian will be doing under their new license.

Basically the study reports themselves provide information to the stakeholders and Appalachian so that we can formulate what we=re proposing to do under the new license. So I don=t want you to think when you get that study report that, you know, it=s going to say everything that we=re proposing to do under our new license. That will come a little bit later after we have workgroup meetings so we can put together our preliminary licensing

proposal. So I just wanted that to be clear up front. I don't want you to be disappointed when you see the reports or anything because it won't contain everything.

We do have a relicensing website claytorhydro.com and it contains all the filings that we have, meeting updates. I do a lot of email notifications to people as well so if for some reason you are not on our email list, if you haven't been getting mass emails on upcoming meetings let me know and I'll make sure you get on there.

Any questions so far?

KERRY BLEDSOE: I had in my notes that that mapping and bathymetry was going to be done by March -- I mean by May.

TERESA ROGERS: May, yeah. It is May.

KERRY BLEDSOE: You said March.

TERESA ROGERS: I did. It is May.

KERRY BLEDSOE: Okay. I just wanted to make sure.

TERESA ROGERS: The other thing, today's meeting is being transcribed so please, for Melissa's sake, when you make comments state your name first and speak very loudly because it is being recorded and she will be transcribing this all out.

There is water, snacks, the restrooms are behind me in the hallway. Anything else logically you need to know? Please feel

free to ask questions during the presentations. With that we'll go ahead and get setup for cultural resources.

Cultural Resources

BRUCE HARVEY: Good morning. My name is Bruce Harvey. I'm the senior cultural resources specialist with Kleinschmidt. Kleinschmidt has teamed with the environmental and geotechnical firm S&ME to carry out the combined cultural resource investigations, part of the relicensing process.

As Teresa has noted, we have began work -- I'm not always the most PowerPoint savvy so bear with me. We have begun the survey, in fact there's a fair part of it done already so I just provided where we are, what we've got going on. What I'll do first and a number of you who were here at the meeting back in January have seen parts of this have seen parts of this but just to recap a little bit to give a background of why we're doing the cultural resources work, which is a combination of archeological investigations and above ground, which could be architectural, engineering, historical features.

The reason we're doing this, it's done under the authority of the National Historic Preservation Act of 1966, part of which calls for federal agencies to take into consideration the effects

of their actions on historical properties.

Historical properties are defined -- the definition of historical properties is any building, structure, archeological site, object that is either listed on or is eligible for the National Register of Historic Places. That=s the National Register serves as the benchmark.

So the goal with this is to identify any properties, any historic properties that may be affected by the issuance of a new license, which is a federal action. So that=s -- project operations may have an effect on historical properties either through erosion, through alteration of buildings, through construction, new facilities. All of these have the potential to affect historical properties. So what we=re doing is figuring out what=s here first so we can make those decisions.

The identification of the historic property doesn=t necessitate any particular action, it=s just a way to understand what is there. These are the study objectives as defined through the study plan and also just as a common sense approach to going about things. First we need to determine the APE, the area of potential effect.

These are areas within which historical properties might

be affected by something that Appalachian is doing under its license.

Primarily for the archeological effects we're looking mostly -- the APE for this is primarily 1850 contour line. Beyond that the chance for direct or indirect effects on historical properties, especially archaeological sites, really is minimal or nonexistent.

Once we have the universe defined -- there has been some work done in the region, in the area. Part of the goal is to identify those previous sites and include those in a database so they can be part of the analysis for what to expect in the future.

From there we start going out into the field actually to first just to locate the general areas that have the potential to contain archeological sites, archeological resources and then go out in the field and actually do some on the ground investigations. We'll go through some of those of what's been done.

So it's sort of coming down the pyramid here. At the same time might take a look at the buildings, the structures, both project facilities as well as we'll keep an eye on any other historical buildings that might be within the APE.

Once we have all that information we'll make the evaluation as to what is eligible, also look at any potential effects once we've identified -- once Appalachian has identified it's

operational issues for the new license and then from that we'll develop a historic properties management plan, which is sort of a -- it's a guideline, a blueprint.

It might have some -- it will have some specifics for historic sites or historic properties. More it has guidelines for how to handle consultation in the future for any future actions that might affect historical properties. That will be the last stage once we know what the universe contains.

So, we have started. We had an initial meeting with the Virginia Department of Historic Resources who assessed the state historic preservation office in Virginia. We met with them, with the Virginia Counsel on Indians and the Eastern Band of Cherokees in Richmond in late February to go over methods, to go over the APE definition and to make sure the everyone was comfortable with the approach.

We then followed that up in late March with on the ground. Teresa managed to arrange some spectacular weather for a tour of the shoreline, or portions of the shoreline, with representatives from the SHIPO, from the Virginia Counsel on Indians, the archeologists and I think the Chamber of Commerce, some other local agencies were involved as well.

The purpose of that was mostly to have the archeologist and the SHIPO talking as they go along the shoreline and saying, well, we think that is going to be -- we agree that is too steep of a slope, best scenario you don=t have to survey.

So just to get some comfort level that the archeologists will be making assessments about what areas to survey and what areas not to survey in the field. That went well. We had spectacular weather and that really was the kickoff for the actual on the ground work.

In terms of the above ground work and I=ll get to the archeology in just a second, just for the above ground resources the point there is to see if the project facilities in particular are eligible for the national register, in addition to generate any kind of historic maps that would be useful for the archeologists, maps or photographs.

So we conducted research to understand the history of the Claytor project in the context to the local region, the local and the regional history. You can see a number of the different historic resources that we=ve checked.

From that that generated maps, that generated some other sorts of documentation, the papers of grand Claytor actually are at the Virginia Tech Library that helped a good bit to understand

some of the Appalachian context. Appalachian Real Estate Department had astounding property records, just details of every single purchase that they made with a title search for that property.

So there was a real wealth -- great wealth of information.

From that I did on the ground review of the powerhouse, the dam, the associated structures and I took photographs, 35 millimeter photographs, both inside and outside. The Virginia Department of Historic Resources, the SHIPO has the standardized architectural survey form and I filled out a draft one of those based on the survey that I did.

I've written up a draft historic narrative to understand the history of the Claytor project in its regional context and to understand the historic significance of the Claytor project. It does have a considerable significance actually in terms of the New River case, which was a Supreme Court case decided in 1940 which dramatically enlarged the Federal Government's scope with regard to the definition of navigable waterways and the Federal Government's authority over navigable waterways. That derived from the Claytor project.

So it has a great deal of historic significance and its maintained, for the most part, as architectural integrity as well. Some

of the things that have been really quite helpful in making that assessment is -- and again Teresa was very helpful with this in setting me up with there were construction photographs from the late 1930's.

She said she thought they had a few of them, they turned out about 500 or so. A remarkable collection, incredibly detailed. Things like this really help you understand how the project was physically constructed. Being able to see parts of it, you know, details of the scroll cases that are now encased in concrete and really can't be seen or to see how they were transporting wood and concrete to the job sites through their own little narrow gage railway.

Keep in mind this is a projection of a low resolution scan of a scan of a photograph and it still has great detail. The originals are just remarkably detailed. This photograph collection also includes pre dam views of the region. You can see the dam and the two coffer dams being built up in the first sets the spillway and the powerhouse being built.

So you get a view of the terrain which is really quite useful for the archeologists to see how the terrain is working. Speaking of archeologists, as I say in March, February/March meeting we coordinated methods with the tribes and the SHIPO and

conducted the boat based visual survey just to make sure that everyone was in agreement on what areas to survey.

The approaches to do the shoreline survey from a boat to look for areas that area less than a 12 percent slope, that have not been previously, the ground has not been previously disturbed or built on. Those are the areas that will be subject to actual on the ground shovel tests.

A shovel test really is just that. You dig a hole about the diameter of a shovel down to sterile soil to see what kind of soil profiles there are, if it=s the kind of soil that=s conducive for archeological sites and also to see if there are any artefacts.

When they do their shovel testing they put these shovels tests into 15 meter intervals. So about every 50 feet they=ll put another shovel test. If they have artefacts within there then they will do closer range shovel tests to try to define the sites. To date the field crews are out there actually right now as we speak, in fact it=s the perfect day for it.

They have four archeologists in the field, a crew chief and three field technicians. They=ve covered approximately 16 miles of the shoreline visually looking at it from the water and about 15 miles -- and this is as of Monday so it=s a little bit more than that

by now. Of that 16 miles they've actually shovel tested about 15 miles of it.

A lot of what they've done so far is down near the dam and immediately upstream of the dam, but just based on weather condition or weather staying -- they've picked up some areas further upstream around Allisonia and some of those areas. They're keeping pretty accurate map records of where they've been.

So far they've, within that 15 miles they've found 12 previously unknown archeological sites, all of them prehistoric. It's too early to say anything about significance, whether they will be or not. But they've identified 12 prehistoric sites. They also have attempted to locate the previously known archeological sites and they found the locations but in a lot of cases they haven't actually identified a site there. They might have to go back and take a look at them again or they might just really not exist anymore.

They will be in the field through next month is the plan, conducting this Phase 1 survey. In July the plan is to turn in a management summary. This is where they'll say we think we have approximately this many sites, this is our initial estimate of eligibility.

By September what we will do is prepare a draft report, a full survey report to Appalachian Power for review and this is where

we get a modification of the schedule that we presented back in January. As a result of the meeting that we had with SHIPO and the tribes in late February we've decided to do an additional limited survey during the draw down in November while the lake level is a bit lower to see if there are some other areas that are of particular interest, at higher potential for archeological sites.

So they will take a look at those selected sites during the November draw down. Because of that we won't actually send out a draft technical report for review until December to January time frame to give them time to integrate whatever new information they might need from the draw down survey. So that shifts the draft reports back by about a month but the end date will still remain the same.

In February, based on the draft report, draft of Teresa's survey report I will prepare a historic properties management plan in February. By March we'll be able to address -- we ought to have comments from the SHIPO so that we can turn in the final technical report, a draft HPMP will go in at the same time and then by May we should have everything finished.

It's actually a doable schedule. The archeologists are right on schedule with the field survey right now. The weather has been very cooperative and hopefully will continue to do so. So things

are on schedule and that pretty much covers where we are right now.

If there are any questions I'll be happy at least to try.

LAURA BULLARD: I have a question but I believe I should direct it to Teresa. I understand that your properties management plan final will be next year about this time, I just wondered, Teresa, on historic areas they identify as being of historic significance that are affected by erosion, erosion continues to happen all the time and I wonder -- and of course your relicensing doesn't take place until actually, what, 2011, so there's a lot of time for more erosion to impact those historic sites, do you think AEP would take any action earlier than relicensing, you know, to protect some if that's determined to be what needs to be done?

TERESA ROGERS: I guess I would envision that coming out of SHIPO and that property management plan and what they come up with because they'll look at, I guess the significance of each one of those sites and the condition of each one of those sites and if they're being impacted by operation or something else they'll pretty much tell us what we need to do.

I mean at this point I would be speculating but that's kind of how I envision that process working.

BRUCE HARVEY: That's the thing, it is a process of

well, in a sense a negotiation, but it's trying to evaluate what the effects actually are and can we identify them and if any archeological sites actually are being affected, if that's the case the HPMP will contain, and it will be done in consultation with SHIPO, it will contain plans to deal with the issue in one way or the other, whether it's through additional survey, whether it's through finding physical barriers, whatever results the erosion survey comes up with, if they've identified ways to control that.

So, the HPMP will include plans for it, exactly when the work will take place it's impossible to speculate at this point, but the HPMP would include, it would address the issue anyway and include plans for it.

LAURA BULLARD: I guess I was trying to find out if you think that AEP might take action prior to actual relicensing.

TERESA ROGERS: I think it would depend on the significance of what's found and where and the details. I don't know --

BRUCE HARVEY: It's also a case where there's a range of activities that could be taken. So that would need to be defined, whether it's avoidance, whether it's mitigation, excavation. There's a whole range of activities and that would -- given that we

don't know what the sites are, what the nature of the impact is and what ways it can be dealt with those would have to be sorted out first, but AEP so far has been working very carefully with SHIPO and SHIPO has, in my experience so far, has been happy with what they've been hearing and it's been a good relationship. I would expect that to continue.

DEBBIE LINEWEAVER: In the shovel testing in the 12 previously unknown sites, is that identification based on soil type, what it looks like it would likely hold or were artefacts actually found?

BRUCE HARVEY: Yeah, artifacts were found.

DEBBIE LINEWEAVER: Okay. But you still haven't determined they are, quote, significant?

BRUCE HARVEY: Yes. The presence of the site has just a certain number of artifacts within a certain area. The significance is typically determined based on the nature of the artifacts, whether they're diagnostic in the sense that they can pin them to a particular time. Most of what they've been finding so far have not been diagnostic.

In other words, it's not something they can pin to any particular time. A lot of it has been lithic, you know, rock flakes from making stone tools. But either the points or the other things that

would actually be diagnostic in terms of time they haven't really found much.

DEBBIE LINEWEAVER: Haven't found the perfect clovis yet?

BRUCE HARVEY: No. Mostly what they've been finding, like I say, is lithic, you know, areas where human activity took place. The artifacts don't -- so far anyway, we didn't find -- the artifacts don't allow them to say, give any particular chronological period to them, which suggests probably not particularly significant but that still has to be dealt with in the context of region.

DEBBIE LINEWEAVER: How will they determine that, dig further in those areas?

BRUCE HARVEY: No. It's more looking at the number, the type, the concentration, proximity to other sites and then discussion with the SHIPO. There is not a whole lot that's real cut and dry. Unfortunately they really haven't found historic artifacts.

We were hoping there might be some tie in to early settlement patterns, something like this and so far nothing of that. Occasional fragment of a broken pot or something, nothing that's of any significance unfortunately. I say unfortunately Teresa does not want to hear that.

LAURA BULLARD: I would say it's already under the lake.

BRUCE HARVEY: Well, a lot of it is the question is what might be up -- the hope was that there might be something further up. We'll see. Thank you.

TERESA: We're going to try and stay as close to schedule as possible because some people may not be coming until 10:00 plus I've got someone to call at 10:00 on this next study, so we will start back again at 10:00 on instream flow needs.

[Recess.]

TERESA: Let's go ahead and start again. Mike Mcleod with DEQ is on the conference call.

Instream Flow Needs Study Update

TOM PAYNE: Good morning. My name is Tom Payne. I'm a fisheries biologist and been involved in conducting and reviewing instream flow studies since about 1980. This morning I'm going to provide an update on the progress of implementing the instream flow study.

Part of my presentation this morning will be kind of a review to make sure everybody is understanding how the study is being conducted and where we're going and then present some of

the results of the habitat mapping data that we collected this last week and get ready for the next phases of study site selection, transect selection and hydraulic data collection.

There=s some other elements that still have to be addressed to flesh out some details that were in the study plan, such as focusing in on what species and particularly life stages to address in the study. So as Teresa mentioned any questions at anytime feel free to ask.

As part of review the study objectives, creating incremental habitat indices through the physical habitat simulation model, as was identified in the study plan, review of species life histories, do a hydrologic analysis of a comparison of regulated and unregulated flows over the same period of time and related to number 1, using that reinformation evaluating the project effects on aquatic habitat and then linking that back to the reservoir elevations, because typically in reservoirs you=ll a balance of downstream effects versus reservoir elevation effects.

Reservoir elevations are for maintenance draw downs and withdrawals for instream flow releases and also consumptive uses. Another element was to try to identify some means of getting information out to the public whenever there is proposed flow

changes. There is a process for that now but one of the study elements was to assess that further.

The specific components of the instream flow needs study for the Claytor project, as I mentioned, the physical habitat simulation of the New River to calculate the habitat indices. I will be discussing that more in detail today. The other elements I will turn to Jot Splenda of Louis Berger to provide a little information on the elevation study, dynamic flow routing and the water temperature data.

JOT SPLEND: Like Tom mentioned, I'm Jot Splenda. Louis Berger Group is collaborating with Tom Payne and associates on various components of the study and Berger is going to be responsible for collecting and we are currently collecting, information on the elevation of the reservoir now and how it relates to the recreation use, which I'll talk about later this afternoon in the recreation study.

We will also be creating a dynamic flow model where we will be looking at travel times and creating post dam scenarios over the same time period and linking it back to what Tom is doing with habitat indices.

We also are collecting temperature information which

will also be included into the habitat indices that Tom was working on, so we're responsible for those last three bullets, or the middle two bullets and the temperature data collection and then Tom will be taking the temperature and incorporating it into his model.

TOM PAYNE: Thank you, Jot.

TERESA ROGERS: I just want to add, I did send out the proposed locations of the additional water sampling sites to the instream flow needs workgroup to consult and do work on it. There was a little bit of confusion because this is in addition to the water temperature data being collected by the water quality group, not instead of or changing anything there, so I just wanted to make sure everybody was clear on that. This is water temperature data that's being collected specifically for this modeling. Anyone have any questions on that before we go any further?

JOHN COPELAND: There is an upstream baseline station?

TERESA ROGERS: For the upstream, of course we've got the site with the mussels, that's already been deployed, part of the water quality but we went ahead and deployed it early to make sure the time frame was the same and then we're using USGS gage water data for some additional data.

Were you telling me that you had checked out that recent data?

MARK HUTCHINS: Yeah. They just started collecting water temperature at the Allisonia gage back in late December, which is continuous temperature there and upstream also. So that data will be available to us as well as the data reflecting mussel zones.

JOHN COPELAND: That USGS data is that hourly?

MARK HUTCHINS: At least hourly. It's probably every 15 minutes. I can't remember. Typically they collect every 15 minutes for most of their stuff.

TOM PAYNE: Just to be clear on the temperature model, for doing a comparison, a baseline, there's already water quality data upstream and at the dam, so you can look at the potential differences as a result of the reservoir being in place.

This specific study is to affect -- to study the effects of temperature releases in the thermal plume and how it might change with different levels of discharge release, all the way to the end of the study reach down near Glen Lyn. So the water quality data collection was not sufficient to be able to do that which was the reason for the additional deployment of thermographs. I believe there were 15

locations that we identified --

TERESA ROGERS: Fifteen, yeah.

TOM PAYNE: With some redundancy and scattered at major nodes, around tributaries. One of the difficulties of the New River, ordinarily you'll put in a thermograph in a tributary in the river, upstream of the tributary and in the river downstream of the tributary, but the width of the New River is such that you are very unlikely to see even mixing for potentially several miles down river.

So we're going to cheat a little bit on the model and we're going to just add the temperatures of the upstream and the tributary and then say that that's the starting temperature of the point downstream, because all these models assume full mixing and so the approach is, if you've noticed, that there's not a triple node, there's double nodes on the tributaries. The reason is that you cannot expect full mixing for quite a distance physically by measuring.

Just a quick overview of the study site starting at Claytor Dam, down by Radford, around Major Bend and ending down there at Glen Lyn. This is the study report that was identified in the study plan. The elements of PHABSIM start out with habitat mapping and the transect selection process and those are the two elements of

where we are today.

We have completed the habitat mapping using the mesohabitat criteria that were circulated earlier this year and now we're faced with the transect selection. So I have some preliminary ideas from the data that was just completed being collected this last Monday and I might throw those out later today but there won't be any formal proposal for that until everybody has a chance to digest this information.

Maybe you could make some comments and recommendations and then we will develop a proposal that will be circulated very soon in the process. The hydraulic data collection and all the rest of that is pretty much similar to what was in the study plan and what we presented in January.

Just as a reminder, the initial phase of PHABSIM generates this sort of a habitat relationship. It relates the habitat index, physical PHI is what I've been calling it lately. It's also known as weighted usable area more commonly, even though it's not area.

So PHI is a physical habitat index. It has some sort of a function in relationship to discharge. So that's what the physical habitat simulation does and then in the context of the water

temperature, species, life histories, water availability and water management practices then you have to interpret these. It's not as simple as saying that that ought to be the flow. That's not the way all these models are intended to work.

Habitat mapping, the study reach was identified as the dam at Claytor all the way down to the Highway 460 bridge at Glen Lyn. That whole distance would be mesohabitat typed. The way we did it was using a small boat, started at the dam and did it in segments.

We didn't do it sequentially because we were trying to avoid certain areas during the weekend where a lot of recreation is, but fundamentally we just started at the dam and ended down at Glen Lyn and tried to identify all the mesohabitat type strata.

There were some comments when we proposed that list that there might be something else because typically it's one of those chicken in the egg things. You try to anticipate the habitat types that are out there but until you're out there you don't know what they are and you can't go out there until you try to identify the types.

So we made a proposal and this was similar to what we did on the Roanoke/Staunton and there were some comments about

what do you do if you encounter a new type and we said, well, if they don't fit these then we'll come up with a new type. So I'll discuss that as I show you the results.

So we use a -- sorry.

PAUL ANGERMEIER: Tom, it strikes me that these habitat types maybe you also need some sort of qualifier in terms of whether they're related to braided channel, which is a consolidated channel.

I mean, there's a fair number of islands and to my mind a riffle or a run in a side channel is different -- or a partial channel is different than one in a whole channel of consolidated, is there information going to be -- it that another stratum I guess, braided versus not braided?

TOM PAYNE: There is a stratum of islands. As we went down we noted all the island locations. You get into a difficulty when you're within islands because on either side of islands often there are different habitat types. So we did -- when we did the mapping we went down through the main channel and habitat typed it and then identified the beginning and ending of islands.

One of the results that we found was that there were sufficient islands, that they should be included in our study. So what

we will do is add island types and put in transects in the major mesohabitats within island clusters. We'll discuss that in more detail as we go through this but you're exactly right. They are different and we do intend to incorporate them in the study.

So we used a GPS unit and as we moved down through the river we marked weigh points, either weigh points at the beginning and ending of mesohabitat units or at the beginning and ending of islands or whether there's a bridge or a boat ramp.

We did all the identification by distance and had a note column as well that would incorporate any individual features that might be of use later. Then this would form the database then for study site selection and transect placement.

Just running briefly through the definitions of pools. I think everybody is pretty familiar with this but we tried to have some more discreet definitions that we would be applying because quite frequently people will have different mental images when you talk about these mesohabitat strata.

We also tend to be more lumpers than splitters because there is no direct similarity between say pools or riffles. They are all going to be different in some case and a lot of them will be mixes of one type or another. So our general approach is to be lumpers

initially and then have enough samples within our strata to be able to cover the typical range of variability that you might encounter instead of having different types of pools.

Then you start getting into, well, are you sampling, you know, a deep scour pool sufficiently versus a more shallow main channel pool. This has been all discussed before. Do you want me to go through these in detail?

They're pretty similar glides, run, narrow or more turbulent, fast riffles, generally higher gradient, more exposed substrates. The slow riffle, not necessarily slow but you can't call it really shallow necessarily either.

Typically a slow riffle by definition has a smaller substrate size within it rather than bolder, bedrock tends to be more, gravel tends to be a little bit lower gradient. Not so much exposed substrate as a fast riffle.

Lateral riffle is kind of a catchall of composites because typically, especially with a wide river like the New River you won't have uniformity across the channel, so we had a lateral riffle. This is an example of the database. We identified weigh points and then had the summary of the habitat type.

Whenever we had a pool or a glide or a run we had a

depth sounder and we would wonder around and try to find the average or the maximum depth, typically more the maximum depth of whatever habitat unit and where it was because we were looking at possibly stratifying some of these further.

In the Roanoke we stratified the pools but also stratified the runs because there was a distinct break in the depth of runs. I'll show you the results here in a second.

Then we note the length of the habitat unit and sometimes -- well, we had to do an adjustment because sometimes we would have a weigh point that wasn't the length of a unit. We would have like we would cross a bridge and the bridge would be within a unit, so then we had to add the lengths of our weigh points to come up with the adjusted lengths.

Then we had a note call to where this was where we had the, you know, the islands noted. A lot of these -- all of these weigh points are actually overlaid through a GPS program onto topographic maps because the topo program that's readily available from National Geographic let's you link weigh points on it.

So what we generated were interactive maps so you could focus in on weigh points. But using the maps and looking at the islands in a lot of instances we found that there were -- either

couldn't find an island or an island was gone. Rarely did we find an island that was actually new and that wasn't on the topo, but there was some inconsistency between the maps and where we actually identified islands.

KERRY BLEDSOE: Hey, Tom, what flow did you take these measurements at?

TOM PAYNE: The flow was over the last week. It varied a little bit but it was typically around 2,000 to 2,500 CFS. So it was on the lower end of the range. So fortunately we were able to see most of the mesohabitats were expressed. It is a danger when you get too high that everything is just all blown through. It was a really satisfactory flow that identified the, you know, the break points.

Here's a fairly large, not a focused in example. I have the river in three different chunks where we started from the dam. These are the individual weigh points as you go down. That can be zoomed in on to where you can actually get to the real high resolution and identify the weigh points and relate them back to the features of the topographic map.

This was pretty much from Claytor down to Parrott. There's kind of a coincidence here in that I was able to get three pictures but they also do tend to correspond to what we think might

be three different segmented reaches, which of course we'll discuss and get agreement on with everybody, but then from Parrott down to a little bit below Pembroke where Walker Creek comes in that had a bit different character.

We crossed a couple of the Appalachian ridges here and there are transverse riffles down through here and Big Falls is located in here. Then as you go down below Pembroke the river changes character a little bit. It tends to be different gradient and you also then have a lot of accretion because you have Walker Creek coming in and then you have Wolf Creek coming in here.

So there's a different character of the river and you also have a big flow change at those points. So there's a geographic and a hydrologic reason to maybe segment that into a separate reach. Is that consistent with everybody's general picture of the New River?

As I mentioned, we did assess the depth of all the mesohabitat units and we did a stratification of the pools and set up five foot intervals of depth category and just did a frequency analysis to see where things fell out. By far most of the pools -- this is a count of the pools, about 120 of the total population of pools wound up in ten to 15 foot range.

Nothing shallower than that that was called a pool but there was an increase in frequency of deeper pools. I think the maximum depth we found out here in one location was around 67 feet. It might have been deeper. We might not have found the actual deepest spot of that one pool but there was quite a number of deeper pools.

So I think as we proceed through this there should be a stratification and a separation of this mesohabitat strata and we should have the majority of our pool transects in the more typical pools but we should also be evaluating some of the less frequent but greater depth pools, because they could be more important for, you know, catfish or some other of the species that might use the deep water.

This is the net frequency analysis by length of all the types. The previous slide was of the count but this is weighted by length so that you can see the -- you can calculate the percentages of the total distance or see it relatively this way.

So this is actually a percent on the Y axis and these were the types. So around of the total habitat a little, about 44 percent was shallow pool, about eight percent deep pool, 28 glide, ten run. A small percentage of lateral riffle, a pretty good percentage

of slow and some of fast. We did encounter the need to add another habitat, mesohabitat strata.

This was the actual spines or the transverse bedrock ledges. Quite frequently we would encounter those by distance. We would have to do a portage and say this is a drop, it doesn't fit into the other types of the categories. It's way too steep to be the fast riffle, it's kind of the next step up of a fast riffle when you're going over the edge.

I will probably not propose any transects. Two reasons, one it's very rarely fish habitat, you might have fish habitat downstream of them but not likely really on them, besides that I don't think I would be able to hire anybody that would work and gather data on something like that. You lose more technicians that way.

Okay, the process of transect selection starts with reach stratification and then goes through the study site selection. Generally we have the goal of some longitudinal distribution. The approach that we've developed over the years is kind of a combination of randomness and professional judgment, because if you use pure random, and we've done this before, you could very easily wind up with all your transects clustered in one spot so you

don't have any longitudinal distribution.

So that's really undesirable to be pure random so we try to use the stratified random where we say we'll have a different segment and we might stratify it by say access points and then say we will select within a certain distance of our access points and then you will select randomly within those strata that you identify.

By doing it that way you wind up with more of a longitudinal distribution even though technically you're still in a random selection. I try to avoid going to someplace and saying, well, I really like doing it there because then you're subject to all the biases of whatever you're carrying in your mind about what you think might be a good place to study.

But you also want to include the more unique habitat type features, which would be, in this case with the New River, there are enough islands to justify a stratification or sampling around islands. So the common approach is once you have done a stratification then within your area of choice you will select the least common mesohabitat type as a random selector and just say it's slow riffle.

That's the least available and so you will number all of the slow riffles and using a random number generator you will select

one of those slow riffles. You go into the field and then that's your slow riffle and then you try to pick your more common habitat types in proximity of that. So it's kind of a randomized clustering of your study sites.

The general target is to choose your total number of transects roughly in proportion to your abundance because your more common types will -- and obviously they're more abundant so if you're doing management you want to be proportional to what's typically out there and you also don't want to have a large population sample by only a few transects.

For example, pools. We would probably propose most of our transects in pools because pools makeup 48 percent of the New River. On the other hand, if you do select some of the more rarer ones you don't necessarily want to have just one representative of that. You would like to be able to capture the range of variability within all of your types. So in general that's the approach.

The remainder of what I was presenting was going to be discussing what we've already pretty much covered. I did want to spend a lit bit more time on this issue of the restratification and the study site selection and I'd really like your feedback in this part so

that we can propose something that's going to be generally acceptable to the stakeholder group.

I mentioned a little bit earlier that it seems reasonable to break the area into three general reaches extending from Claytor Dam to Parrott and then from Parrott down to a little bit below Pembroke right at Walker Creek. I would do it at Pembroke but it makes sense to start at Walker Creek because that's where your major hydrologic nodes is and they are actually quite close to each other and then from Pembroke or actually Walker Creek all the way down to Glen Lyn.

So that seems to be fairly acceptable. So within that, because of the importance of the islands and given that there is a certain amount of effort to be allocated to be placing transects my initial thoughts that we -- within each of the three main reaches we would have two study sites, one of which would be a predominately or entirely main channel and the other would be in association with an island. Then we would place transects proportional to the abundance of mesohabitat types with a main channel cluster and then an island cluster.

We wouldn't be putting in an equal number of transects into the islands because we would have a combination of island

transects and then upstream and downstream of the islands we would have main channel transects but they would be in association with the island.

We will need to gather a little bit more information on the islands because the flow splits tend not to be linear. As the whole river flow changes you'll wind up having the flow split percentage be different on either side of the island and so we will probably, as we've done before, gather additional cross section profile data at the upstream end and the downstream end of the islands and we will use a two dimensional hydraulic model to then calibrate to observe our measured discharges to be able to route the water through the islands over the whole range of flows we would be interested in.

It's one of those little wrinkles that you have to do when you include, we include islands, it takes a little bit more intense data collection effort to deal with it. In relation to the islands the one thing that we found is that most of the islands are single islands. There might be a little chain of single islands but it's actually quite rare to have complexes of islands where you'll have many different channels and many different islands.

I believe that they only found two areas that were like that and they didn't seem to be all that unique or special but unless

somebody knows more about them I would propose to do our island transects in the areas where they are fairly simple islands.

One of the complex island areas is immediately below the 81 bridge here where there=s kind of a wandering side channel and several islands that are around in that one particular area. We get very complex and very elaborate to focus a lot of study effort on that one little area like that because none of the rest of the river is like that. There is one more complex area further downstream.

So I would not propose to be studying those as having, you know, unique or valuable properties. It would be focusing more on being representational of the majority of the habitat in the river. So you can think about that and, you know, we=ll give a proposal for everybody=s consideration on that topic.

JOHN COPELAND: Where are the other island complexes that you=ve identified? I know there=s one at Whitethorne

TOM PAYNE: That might be the one. Since I wasn=t out on the river and had one day of my field crew for them to tell me everything they found and they told me where it was but it didn=t stick.

JOHN COPELAND: There=s another one just upstream

at the mouth of Walker Creek too, over at Pembroke.

TOM PAYNE: Right in this area? Oh, right there at the point. There=s one right there at the bridge, isn=t that Castle Rock or what=s the name of that?

JOHN COPELAND: There=s one island there but they=re complex downstream from there.

TOM PAYNE: In this area here?

JOHN COPELAND: In that reach right there.

TOM PAYNE: Is it a multiple braids or is it a chain of islands?

JOHN COPELAND: It=s several islands. It=s at least two, maybe three.

TOM PAYNE: Are they in sequence or adjacent?

JOHN COPELAND: They=re in sequence.

TOM PAYNE: Okay.

JOHN COPELAND: There=s some side channel areas.

TOM PAYNE: Well, if they=re in sequence that=s not what I was referring to as really complex. Complex would be three or four islands --

JOHN COPELAND: Across the river.

TOM PAYNE: Across the river. Yeah.

PAUL ANGERMEIER: Tom, you may have said this and I missed it, so you're going to sort out some of these island areas, the ones that are sequential and then how are transects placed? Do you put one in there or it would be multiple transects in this island area?

TOM PAYNE: It would depend on the mesohabitat strata within the islands.

PAUL ANGERMEIER: So you try to capture all the pools and riffles and whatnots that were in that island association?

TOM PAYNE: If there is abundance of mesohabitat types on the -- within the island itself then we would be representing each of those mesohabitats, but more typically there's only a single or maybe two mesohabitats and so we would get both of those?

PAUL ANGERMEIER: I see. So it's all sort of case specific?

TOM PAYNE: Yes. So what I was thinking about doing was having, you know, within each of the reaches have kind of a dual selector. The selector of islands and then we would randomly select which island to go to and then we would have areas without islands and then we would randomly select in those areas without islands.

So we would very definitely then having a combination of

the main channel and then the island with main channel in our sites. So within each of our clusters -- I think the study plan identified a number of transects all together but I'm thinking of a range around 30.

So we would have within each of the clusters have four or five cross sections. That would not be counting the ones above and below the islands for the two dimensional modeling. That would give us about ten transects in the area in each one of the different reaches that we would have. It gets a little bit interesting once you get down into this area with the accretion because then if you have a habitat index, remember those functions that we had, you would have to adjust that based on the accretion because what you released is not how much water is in the river.

So if you're relating your releases to the habitat index, if you generate a habitat index it's an absolute value, it's not in relation to the release it's in relation to the release plus the accretion. So, the habitat indices for this reach from Walker down to Glen Lyn will have to be adjusted by the accretion.

It's gets a little bit dicey in this case because you have accretion here at Walker and you also have accretion here at Wolf. We might wind up having one cluster of transects below Wolf and

then one between Walker and Wolf. So then if we wanted to break it out with the accretion of both tributaries we would be able to do that.

The sample size is going to be on the low end when you get down toward five but once you merge that in with all the other transects you should have a representative composite and you can also focus in on individual reaches if you chose.

So that=s roughly what I was thinking about based on what we learned this last week. We will prepare a proposal along those lines, unless anybody has any other individual comments right now that=s likely what you=re going to be seeing in the next week or two as we draft up something and send it to AEP.

BILL KITTRELL: I know it may be a little early for aquatic vegetation to be up, I=m sure water willow is visible, but how do you incorporate that into your transects.

TOM PAYNE: We noticed that there was some of that when we were doing the mapping, we also noticed that there were small mouth bass, spawning activity was almost entirely within the macrophyte beds that were developing, you can approach that in a couple of different ways.

I=m working on a project in Eastern Washington right now where that=s a critical component. Their macrophyte beds are

so abundant they have to send in mowers so that they have open channels to be able to have boats navigate through. So the transects that we have there they specifically, all the stakeholders specifically said that they wanted velocity patterns with and without the macrophyte beds because they were so thick they would actually affect the flow distribution and velocity.

So we went in there. We've already done all the transects there with the macrophyte beds before they grow and we're going to be repeating the data collection on those transects. So we'll have a split model, we'll have a seasonal model with and without the macrophytes.

So that could be done. It wasn't identified as a critical component to date in the study plan. So what we would do would be to measure them when we're out there and probably -- well, another thing we'll get to is schedule here, but they will probably be fully developed. But do you think the beds are strong enough to affect the distribution of velocities? I mean clearly it will be slower within the beds.

BILL KITTRELL: In some areas I guess but not, probably not generally speaking.

JOHN COPELAND: We get some dense elodea beds in

the Whitethorne area. I=ve seen pond weed, extensive pond weed in some areas on Rich Creek and down to Little Narrows Falls in that area.

BILL KITTRELL: That may be site specific where flows could be affected. They are important habitat types.

TERESA ROGERS: Are you recommending there be a transect, or targeting some of these areas for a transect, is that what your recommending?

JOHN COPELAND: I think it would be useful.

UNIDENTIFIED SPEAKER: They are central habitat for lots of game species. They are a stabilizing factor in these areas with all the rooting. I=m sure they have their own habitat characteristics that do affect velocities.

BILL KITTRELL: One issue that, you know, right now we=ve got some exotics down in some of these areas where vegetation really gets thick during low flows and causes navigational problems like at Whitethorne, but now that hydrilla has been found in Claytor, you know, five, ten years down the road we may even have more problems in some of these vegetative areas, so it probably wouldn=t be a bad idea to have a transect in a heavily vegetated area.

TOM PAYNE: What we could do then is approach that in steps. We could make a broader proposal for where our transects are going to be but I fully expect that we=ll have feedback on that and then we=ll go out in the field together, whoever can make it, then we=ll visit the transects and make sure that the transects that we placed are acceptable.

When we do that we could look at those individual areas and make a judgment about placing transects in them.

BILL KITTRELL: To see if the transect captures some of the data --

TOM PAYNE: Then we could modify the transects to deliberately capture that and then see whether it=s a, you know, a specific problem issue that might take more data or whether we can do it in combination with open areas and vegetated areas. We will validate that in the field.

PAUL ANGERMEIER: Seems like it might be better to incorporate vegetation on the front end as one of the strata when mapping these types, does the recon allow you to map riffles with and without vegetation, runs and that kind of thing, pools?

Could that be one of the descriptors that helps type these units?

TOM PAYNE: It could be. When we did the mapping the beds weren't that fully developed as they would be later in the season, so we had no information on identifying them as strata at this point.

PAUL ANGERMEIER: But that also suggests there may be a whole lot more of it there than -- I mean, I'm nervous that going out after the fact and sort of manually adjusting the position of the transects may not really capture the full array of habitat types, if in fact vegetation is an important component of what kind -- or the quality of that riffle or run or pool to BioDa then that needs to be something that's put in on the front end rather than as an afterthought.

TOM PAYNE: If you can provide us your knowledge of the macrophyte bed areas, based on what you know now. You know, you have that knowledge and I haven't been able to get that knowledge.

So if you would do that and comment on some of the areas like Whitethorne and if you can do it more specifically from your knowledge then we could try to incorporate it in on the front end and target some of those areas. Then we would be better informed when we go out to actually make our transect placement.

PAUL ANGERMEIER: On a related note, again anticipating how this is going to translate into the biological effects, it strikes me that there may be and I don't remember the exact pool characteristics you used, but I can imagine that a V shaped pool versus a saucer shaped pool is going to be very different in terms of its provision of fish habitat, particularly for names like young fish and small fish and those two kinds of dichotomous shapes were also going to be more differentially sensitive to changes in flow.

So might there be another sort of strata that incorporates information about pool profiling or depth profiling, what does the shape of that thing look like. Another -- maybe I'm leaning too far toward the splitters versus the lumpers but to me that's a pretty important type of pool to sort out.

TOM PAYNE: Actually I think we're on that track already because we are going to be splitting the pools by depth. We will have a strata of pools less than 15 feet and a strata of pools greater than 15 feet and by far the majority of all these are in very narrow canyon areas.

So they are definitely -- where it is that deep it's clearly been scoured by the energy of the river because of the constriction and these pools are in the area where the river is much wider and

much shallower as a consequence. So I think we're already addressing that concern by doing this.

RICK ROTH: I have a general question which I hope isn't too far off the subject but in the revised study plan we talked about doing a parallel study using the IHA program, are you doing that? Who is doing that?

TOM PAYNE: I am not doing that. I think that's part of the impaired and unimpaired analysis.

RICK ROTH: It's on page 7 of the revised study plan for instream flow needs and reservoir elevations.

TERESA ROGERS: Which page?

RICK ROTH: Page 7 of the revised study plan for instream flow needs. It says in addition to IFIM Methodology a parallel study using the Nature Conservancy's indicators of hydrologic alteration program will be incorporated.

TERESA ROGERS: Let me get back to you on that.

TOM PAYNE: The IHA is a statistical analysis of the hydrologic patterns over time.

RICK ROTH: Yeah. What I wanted to ask about that -- I mean, I've looked at the data sent from the Radford gage and there's only five years worth of pre dam data, I'm wondering if we

could as a surrogate use upstream data from the Allisonia gage compared to downstream at Radford.

TOM PAYNE: I'll let Berger -- I don't think they have the people here that know the technical issue but I think what they were going to do, when you do the impaired and unimpaired, it was going to be for the same time period. So the unimpaired would be reconstructed based on inflows and reservoir elevations.

So there would be a regulated from the Radford gage but there could be an unregulated for the same years and same days that would be recreated as if the project was not there. That's the best way to do an IHA unless you have a long term period of record and then if you can't do that to get an impaired, unimpaired synthetic then you look for either pre dam or upstream. So I think that's --

UNIDENTIFIED SPEAKER: And the IHA was part of the hydraulic modeling that Berger was doing so In comparing you're right. The pre project, post project in the hydraulic. So that is --

RICK ROTH: So it will be done?

UNIDENTIFIED SPEAKER: From a straight hydraulic perspective, yes.

TOM PAYNE: Yeah, hydrologic --

UNIDENTIFIED SPEAKER: Hydrologic, sorry.

Hydrologic perspective.

KERRY BLEDSOE: I was just going to ask, when you do your transects -- this relates back to that vegetation issue, you'll be collecting, I assume, substrate velocity and depth at each of your points along the transect, so the issue of vegetation would you have to have habitat suitability indices for those whatever species those are? Are they available? I've never seen those myself.

Surely you would need to either develop those or find those in the literature report or else you're not going to be able to evaluate. I think maybe they're thinking how is this going to evaluate fish habitat but it's really all you're going to be able to evaluate is how it affects the vegetation growth at the various flows, am I --

TOM PAYNE: Well, the way we'll collect the data is we've given up on the old suspension system of the boats and we use the acoustic Doppler current profiler system. So in open channels you'll be able to get that. Within sparse macrophyte beds you'll still be able to get your depths and velocities but it will fail based on the interference of the beds once they get thick enough and in those areas we will be using the manual velocity meters.

The vegetative component, there's a lot of elements

that could be dealt with. If we gather data when all the macrophyte beds were fully developed we will know the depth profile and if there is a seasonal component or the macrophyte beds are not there we can actually reallocate the velocities across the channel and change the roughness characters of the areas where there=s beds and where there=s not going to be beds over the season.

So you can actually simulate the velocities without the beds. Now that=s going to be not as accurate of course as if you were actually to measure it without the beds but, you know, it should be reasonable. You could make it comparable to other transects where you don=t have the macrophytes.

So we can approach it from the hydraulic standpoint I think fairly well but the criteria are another matter. A lot of the criteria actually do have components of macrophyte habitat quality and if you have macrophytes they will have a different suitability.

I don=t remember precisely but I=m pretty sure that the substrate cover coding system that we did use had a macrophyte component to it. So it=s going to be a fairly elaborate exercise as we go through this summer to identify -- well, maybe we could move to that right now and go to that question here of further developing this.

This was the list of species that was identified in the

draft study plan or in the revised study plan but it didn't address what, you know, what actual life stages to use so we're going to have to not only make sure that these are all the main species we want to analyze and then have to evaluate what life stages and make sure that we address the macrophyte component of the different life stages, whether it's important for spawning or juvenile rearing in particular.

So another one of the misses you're going to get from us over the summer is identification of potential habitat suitability criteria for all these species, identification of gaps, where there may not be any and then trying to come up with an approach where we might use surrogate species or we could wind up, you know, doing the old Bogsat routine, which is a bunch of guys and girls sitting around the table.

It's generally not advisable to do that but you can do that. You should know that your results are going to be less reliable than if you actually have some observations of your species. But I am pretty sure that there's not going to be anything on some of these species.

PAUL ANGERMEIER: What are the criteria you would use to choose the life stages? I mean, is that also a Bogsat

procedure?

TOM PAYNE: No, it has a more elaborate -- that's a stakeholder consultation procedure. We call it SCP. Running curves is not a large cost component of one of these studies. Collecting the data for coming up with new criteria is extremely expensive and complicated.

That was not identified as a necessary component because most of the important species here already have good habitat suitability criteria or a good choice of potential ones to apply to the New River. So whatever species and life stages that you want to run is a function of what the group consensus is to come up with them and then having suitable habitat suitability criteria.

But I will tell you that looking at that list is going to boggle your mind when you start getting the results and trying to make sense out of all the different species responses that you're going to get because they are going to be contradictory, because you're going to have some species -- I don't even see some of the real fast water species on here. Most of these are slow water species.

The fast water and the slow water species are going to have contradictory suitability curves when you get to the five. Some

of them are going to like slow water and some are going to like fast water at the same time and the same place. Then you have to decide what to do.

So the more species in life stages that you run through the more of a headache it=s going to be to try to make some sense out of it at the end because then you get into with and without macrophyte beds, you get into with and without accretion, you get into with and without accretion at different times of the year and pretty soon your brain will crack trying to make sense out of all this stuff.

So I=m just saying ahead of time be aware that the interpretation is going to be a burden.

RICK ROTH: I can=t resist just interjecting --

UNIDENTIFIED SPEAKER: I hope you=re not an example of that, Tom.

RICK ROTH: That=s why we=re promoting the nature conservancy approach it=s just to avoid that mess and say --

TOM PAYNE: Well, the nature conservancy approach is actually low information. All it does is tell you --

RICK ROTH: Yeah, it=s cheaper for them.

TOM PAYNE: Huh?

RICK ROTH: It's cheaper for them.

TOM PAYNE: Well, what it does is give you a frequency of 32 different hydrologic parameters. Now the median monthly flow, the two year flood occurrence flow, the rate of change from one day to the next day and so you have this big statistical database of say unimpaired hydrology and it will give you for each one of your variables it will have a distribution and standard deviation around the mean of what that is.

Then you compare each one of those to the impaired and you can see how they're different. But seeing how they're different doesn't tell you what you ought to recommend as a flow. The IHA is useful for identifying potential areas of biological impact for project operations. In this case, you know, the hydro peaking is going to be quite dramatic because then the fluctuations are going to be much greater without the project, or with the project than they are without the project.

So that statistic is going to stand out but then what do you do about it. The IHA has no guidelines --

BILL KITTRELL: It doesn't really give you an indication of whether those changes are good or bad before the BioDa, other than the fact that they are different -- pre condition; right? Or pre --

RICK ROTH: My understanding is that the logical next step is an unimpaired flow is the recommendation, so how can we get as close to that as possible and still be impaired?

TOM PAYNE: Well, and that=s where it gets into the pushing and shoving of -- see, that=s where the IHA fails is because it doesn=t tell you anything about the individual species response.

RICK ROTH: Well, but then this fails because you=ve got all these species and they=re contradictory in terms of their management implications.

TOM PAYNE: Well, it depends on how you are approaching it. Like the way things happened on -- can I talk about the Roanoke?

TERESA ROGERS: Yes.

TOM PAYNE: They had the same situation of all these conflicting species and so as an initial cut we separated the spawning from the rest of the life stages and then just merged the indices of all the life stages and it came up with the high point of that curve almost exactly the way they=ve been operating the project and everybody in the room was thinking, well, yeah, that=s not so bad.

It was kind of meeting everyone=s preconceptions about how the river looked biologically in terms of the flow response. So

it=s like, well, shoot, that all kind of make sense. We can drive ourselves crazy and look at all the individual species but if you look at it as a whole it made really good logical sense.

Even though at times you were trading off one species versus another species in the whole it seemed pretty reasonable.

BILL KITTRELL: It may be breaking out by life stage multiple species and looking at those at one time versus a different life stage of all the species instead of trying to look at each species individually and through all its life stages.

TOM PAYNE: There=s many different ways of looking at it. I guess the point was that this data from the PHABSIM and the IHA points you in the direction of having enough information because individually you=re right they=re not really quite sufficient as a rule, depending on what you=re really looking at. This project is basically a flow in flow out. It=s not filled in the winter and drained in the summer.

So on an almost daily basis it=s flow in flow out except it does fluctuate downstream because of the peaking. So it=s not like you=re trying to identify here what the minimum flow ought to be or what you ought to have as a flow regime because the flow regime on the out is the same as the in.

So then you have to look at what is the fluctuation doing.

That=s really what the big issue here is is to whether the fluctuation is having that big of an effect and whether you should do anything about it. I=ll tell you right now that=s going to stick out like a sore thumb from the IHA because those are some of the statistics.

So focusing on all this is not really looking at what the flow regime ought to be because the flow regime is the same as it was without the dam, you know, with some minor changes by management, evaporation and whatever else but they=re still basically the same.

So the focus of the study and the impact is really the fluctuation. This is what I understand are pretty good small mouth streams so maybe it=s not so bad already.

BILL KITTRELL: Getting back to the sort of the lumper splitter mentality, are you saying, you know, because we have so many interests, you know, and we manage sport fish, we manage non game fish, mussels, you know, and the whole range of species are up there, would it be better, in your opinion, to try to narrow the focus and get more concise analysis or would it be better to leave it this broad and just have more information to wade through?

TOM PAYNE: If you=re specifically concerned about

management species, target species, this will give you the information to focus on those if you choose. You might just say in certain months the small mouth bass rule and so I'm going to manage or make a flow recommendation on the basis of the small mouth bass and then I will look at what happens to the other species and as long as I'm not hammering something else then I can use that.

When you do an instream flow study like this there is no one answer. It gives you the tools to be able to negotiate tradeoff and evaluate alternatives. That's what this does.

BILL KITTRELL: And again it's only talking about impacts of physical habitat, there's still the biological response that you have to --

TOM PAYNE: There is a time component and you always have to incorporate the time component. I mean, this is why you might get into a time series analysis. A time series analysis is a part of this. With the impaired and the unimpaired you could take the individual species habitat curves and run them through the hydraulic analysis. Then you can compare the amount and times of habitat under different flow issues.

So very definitely you have to incorporate the time

component as -- one of the major complaints of the original instream flow group was that people would do PHABSIM outside of the context of the IFIM. They had a workshop in Fort Collins a few years ago where they invited everybody in the world and they pretty much laid down the law that said unless you use time series you can't call it an IFIM, because they have a lot of vested interest in the name IFIM.

But too many people are going to tell you it's not a laughing matter because I've dealt with it my entire career is this where people see this curve and they say that's my flow because that's the peak of the curve and that's the flow that I want and if you don't give me that flow then your project stinks and sometimes they do stronger language than that.

That, of course, drove the instream flow group who created this method crazy because they said that this by itself is absolutely meaningless until you incorporate the hydrologic components because this down here is independent of flow availability and the biological response, of course, is directly dependant on flow availability.

So you have to incorporate that. So once you get to all the species you can do a prioritization, you can do a comparison, you

can do a merging, you can split it, there=s a lot of different ways to do it and it=s going to be up to the group to decide how to proceed once we have this information. I can make recommendations but you guys are going to have your own perspectives.

PAUL ANGERMEIER: I appreciate that we=re going to have to do a fair amount of pushing and shoving as you say to sort out how to integrate this information, but one thing that I think would help that is a compilation of what is known from the literature of what that list of 20 species or whatever it was needs or requires in a way of flow and temperature and habitat configurations and that sort of thing.

I guess my question is is that going to be compiled in a form that we=ll have readily available or is it going to be given to us, well, here are the species for which we have curves, you know?

How much of that would we see and be able to then use to inform our decisions about how to --

TOM PAYNE: You guys already know all that.

PAUL ANGERMEIER: No one in here knows all those life stages for all those species you had up there a while ago. Months and months ago and I don=t know where it ended up on the butcher block of things the we suggested be done but we wanted to

have a fairly comprehensive review of what=s known about those different groups. Is that going to be done?

TOM PAYNE: It=s one of the objectives and it will be tied in with the development of the habitat suitability criteria. The species life stage periodicity chart is one of the components. That will be one of the products of the analysis so that based mostly on what you guys know but also at what part of the task is is to acquire whatever other information is available and then use that to be able to inform the interpretive process. Very definitely that=s one of the components of this study.

PAUL ANGERMEIER: And how -- in the chain of events how early on will that information be available. To me it=s going to be -- you=ve got kind of a chicken and egg thing going on but the earlier that we can start to see the information and think about then how to design these other analysis will be beneficial.

TOM PAYNE: It will be tied into this over the next three to four months because you don=t need either of the criteria curves or the periodicity until you acquire the hydraulic data, calibrate the models and then start generating -- when you are ready to generate your habitat indices that=s when you need this information.

So we have a window of about four to five months to

work on both of those elements. They are definitely part of the work product and the consultative process.

RICK ROTH: I have a process question which probably is addressed to Teresa. So we're going to end up with all of this information and then there's going to be as you say some pushing and shoving in figuring out --

TOM PAYNE: He said that.

RICK ROTH: He said that. You said something like that.

TOM PAYNE: Don't you dare quote me.

RICK ROTH: Sorting out, you know, okay, what are we trading off against what and what did we come up as a flow recommendation, when does that happen? When is the forum for that?

TERESA ROGERS: Okay. Tom will come up with the instream flow needs report based on everything to give us information to the workgroup. Once that report is done that's when the workgroup will -- that's the final report, that's when the workgroup will get together and start making some of these decisions, you know, is there a specie that you want to manage.

It's a workgroup process but it's after the information gets put into that report, so we have information to make those

decisions based on that. His report will not come out necessarily with this is the flow. There will be information for the workgroup to make those decisions.

TOM PAYNE: That=s where we are right now with the Smith Mountain project is that we prepared the report, DGIF has asked for a little bit more analysis, we=re going to be providing that analysis and they are in the final phases of developing recommendations back to AEP.

RICK ROTH: Did you have a shorter list of species in that case?

TOM PAYNE: For that one?

RICK ROTH: Yeah.

TOM PAYNE: No.

RICK ROTH: Just about the same?

TOM PAYNE: Just about the same. We didn=t have any of the mussels and we had at least three species of red horse, I just don=t have red horse on this list. There=s no red horse --

BILL KITTRELL: From your experience just looking at that list that you say habitat suitability criteria exists for most of the ones on the left side and the ones on the right side are going to be the --

TOM PAYNE: Rock bass we have, small mouth, flathead and channel. I don't know if we have a difference. I know we have channel, I'm not so sure about flathead. Musky, I haven't ever run musky before. I think there's some papers that have musky criteria. Redbreast sunfish definitely. We have chubs. We have a generic logperch. There is also some silver shiner.

I'm not so sure about the greenside but the shiners tend to come from Nebraska and they tend to be on the squirrely side, because of the way they were collected not because it was Nebraska.

We have northern hogsucker and we think we have whiteshiner. There should be something on the mussels because that's been a focus of Virginia studies here recently. So I'm not sure if it's these species but I know that USGS in particular on that, I think north fork of the Shenandoah has been doing some work with mussels.

Jennifer Christolic with USGS just finished getting, I think her Master's, in relating instream flow to mussels. So I think we have mussels. Macroinvertebrates, that could be dealt with in several ways, one being just identifying some individual species and getting some that are available for those species or it could be using

Jim Gores curves that are, you know, more generic type curves that area more like not families but use groups.

There are several different ways of doing macroinvertebrates. There is nothing on crayfish, nothing on hellbender, riparian vegetation, water willow. If I would have been involved in the discussion initially with those things they would not have made the list because there is no information on those. There=s not even necessarily a relationship between, you know, daily instream flows in any of those species.

Riparian is affected more by channel geomorphologic processes. If you have irrigation by constant releases where it was fluctuating more than you will get a riparian encroachment. If you don=t have over bank flows you might lose your cottonwoods to deposit sediments that the new seedlings can grow in.

Riparian vegetation doesn=t really belong in this type of an analysis. Water willow, there were some studies done in the San Marcos River in Texas that they used quite a few species of aquatic vegetation, so we could look at those, but that=s also fairly weak.

Remember the original basis for the whole PHABSIM was a correlation between these habitat indices and species abundance, meaning that the variables of depth velocity in substrate

cover accounted for almost all the habitat variability and the biomats over time. That's only been really validated for a small mouth bass and a couple of species of trout.

All the rest of them, all these other species are based on a presumption that that correlation exists. It has never been validated. So always kind of keep that in mind that this is a general information type of an analysis. This is not definitive.

PAUL ANGERMEIER: We have had those in mind, in fact, almost all those species and particularly the riparian vegetation that you accurately pointed out are up there because we were concerned about the operation of the dam affecting the distribution and persistence of those species. That was before we got reduced to this PHABSIM analysis which has very limited ability to say anything about any of the stuff that we really care about.

So we are aware of that and it's not because we chose the species incorrectly it's because the tools have been chosen incorrectly to give them probative hand. Now, in retrospect the riparian vegetation it seems to me it could still be sensitive to frequency of floods and droughts.

I don't know whether any of that is going to be addressed in the IHA or elsewhere but in the water willow, to some

extent I would think too would also be subject to changes in more seasonable distribution of water as opposed to this sort of day to day distribution of water.

TOM PAYNE: Well, you're right and I understand more now about how that happened because those, especially the riparian, needs to be evaluated by an entirely different type of a study.

PAUL ANGERMEIER: As do all the others in terms of population response.

TOM PAYNE: Well, population response is something that I understand there has been quite a bit on small mouth bass but there hasn't even been any population studies for most of these others has there?

PAUL ANGERMEIER: That's right.

TOM PAYNE: So, the riparian vegetation -- I guess this will part of the discussion as we go forward but if you're specifically concerned about riparian vegetation, you know, that gets into issue of the geomorphologic response.

RICK ROTH: Really I'm just tying it to up and down of the flow.

TOM PAYNE: Bank erosion and that. So I can't -- I don't know where that is in the scope of all this.

PAUL ANGERMEIER: It got left on the chopping block.

TOM PAYNE: Not my job.

JOHN SMITH: This is John Smith at FERC. I just want to call one thing to everyone=s attention, our study plan determination with respect to the crayfish and hellbender did depend on what could be determined with this study. If it=s found out that those species can=t be addressed through this instream flow needs study then another study could be required in the second season. So I just wanted to make -- it hasn=t been chopped away so much that won=t consider it.

PAUL ANGERMEIER: Does that apply to the other species? My guess is that more than half of those fisheries aren=t going to have good information either.

JOHN SMITH: Another point is is that there is no -- the licensing may not want to collect site specific data but I don=t think that=s been determined that it can=t be done. I mean, if it has to be done then that=s something else that could be considered.

PAUL ANGERMEIER: But who says it has to be?

JOHN SMITH: Well, ultimately if they=re not -- if they don=t agree to it we would have to make the call, but it=s been done at other projects so it could be done for this one.

TOM PAYNE: A lot of this depends on their needs and actually knowledge of the stakeholders and the participants. My experience has been mostly on the east coast that relicensing procedures have been satisfied with literature criteria. There has not been a large push to get site specific data.

The experience on the west coast is exactly the opposite. Over there in most studies we=re required to do site specific data, including as far as being on the same river ten miles away, that there=s been a requirement for site specific criteria curves to that level of detail.

So there=s been a whole lot of data collected on rainbow trout and brown trout to some extent on some of the anadromous salmonids on some white fish and some of the other, you know, higher mountain cold water streams. Most of the work on these species, with the exception of the small mouth bass has been just pure research projects. They weren=t even connected to hydroelectric relicensing.

Like the Minnesota Department of Natural Resources done a lot of work on several of the species. There has been students doing dissertations. I think the northern hogsucker and the redbreast sun fish I think that was Persinger=s work under Don Orth

several years ago.

So, the general approach has been to look at those curves, see whether they make sense from the perspective of the participants, make some adjustments and either accept them or take whatever other steps are necessary.

In the Roanoke we went through this process and Game and Inland Fish and several others made recommendations to the curves that were candidates and then we were jointly satisfied and the process worked out just fine. But remembering if you're trying to get highly specific habitat suitability criteria that doesn't necessarily mean that your habitat index response is actually going to relate to the bottom half because that's another whole validation step.

So, to ask for site specific criteria curves just for getting that level of detail is only one part of the whole puzzle. You still have to make fairly gross assumptions on other parts so you might spend a lot of time and effort on something that you can't use.

One of the main differences in the east coast and west coast obviously is that in the east coast there are so many more species occupying the same river and the same general area. On the west coast it tends to be generally fairly sparse species. So that's generally the -- I don't know how many studies I've done where the

only thing in the entire river is rainbow trout, there=s no sculpins, there=s no shiners, there=s no nothing just rainbow trout.

In that case everybody said, oh, let=s just spend all kinds of money on rainbow trout so you go ahead and you do that, but here you start saying, well, which one am I going to pick. The ones that are actually the most valuable are probably the small mouth and the musky. I know there=s quite a bit on small mouth. Whether that applies to the New River as opposed to other types of rivers that=s another question.

BILL KITTRELL: Our problem has been just picking some representative species, surrogates maybe for something and have something else that -- there=s several other species that are out there that there would be some information on.

TOM PAYNE: Here you can, you know -- I=m only beginning to be involved in this process and you guys know a lot more about it than I do but you can get a whole lot of information on all these, which could be related to more seasonal effects and really what=s going on here is the fluctuations.

You should really focus your concern on the effect of fluctuations not on the annual hydrograph as to what=s happening, you know, over time, because over time this is a runner river project

in the larger time scales. There=s not a bypass reach, there=s not seasonal storage, it=s not operated as flood control, or very much if at all.

So it=s the fluctuations that are the focus of the biological impact. If you try to think of it in those terms then I would think that several of the species on this list might drop out a little bit more.

PAUL ANGERMEIER: So will sensitivity to fluctuation be one of the pieces of information that we get in the literature review so that we can compare and contrast with the process through the species to say which ones need to be paid attention to or not?

TOM PAYNE: I don=t know that there=s going to be that much information on sensitivity to discharge.

PAUL ANGERMEIER: To fluctuation.

TOM PAYNE: I mean, fluctuation. The one thing that you get from this type of a curve you tend to get into that sort of a threshold analysis. There are often species that will have a very steep drop, especially the slow water species. If they have a high suitability for a low velocity and you start running velocities through there their habitat index is going to plummet.

Conversely you might have one that requires a high

velocity that doesn't like the low and so there will be a really steep climb. On the fluctuations, as you cross back and forth with your discharge on those steep inclines that will show that there is a substantial response in the habitat index, but then you have to consider whether that's translating back into the biological response.

One example not necessarily relating to this curve but trout species have typically had an upper temperature threshold and the standards have been as you get over this threshold, whether it be 18 or 20 degrees centigrade then things are bad, but they've done some more research in the Columbia River that had diurnal fluctuations and the temperatures went up during the day to 27 centigrade and the cut throat trout were fine because it went down into the 16, 17 at night.

So the temperature threshold, which was thought to be fixed, was actually a variable threshold based on the diurnal fluctuation. So something similar could be happening with that. So, I don't know how much you can expect out of these types of studies.

A lot of it is going to depend on what the species are doing right now under the current regime and maybe what they're doing like in river sections where you don't have this sort of a flow fluctuation going on. I think vastly different in one system

versus another because that=s another indication kind of like the IHA with the impaired and unimpaired that you=ll focus on something that might be an indicator of a problem. If there were no small mouth bass in the New River I would be really concerned about it because other rivers like the New River should have plenty of small mouth bass. Since, to my understanding, you don=t --

RICK ROTH: They=re not native.

TOM PAYNE: My family is from Virginia. Oh, they=re not native.

RICK ROTH: I wasn=t making a personal attack.

TOM PAYNE: Actually that=s happened. That=s happened up in Maine in particular. If you=re a California boy and go up in Maine you=re in trouble right off. Them Mainers don=t like people from out of state.

TERESA ROGERS: Do you want to briefly touch on what calibration portions?

TOM PAYNE: What calibration portions?

TERESA ROGERS: Just bring it up and look me know what you=ll be consulting on.

TOM PAYNE: I=m just about done here with this. The rest of the presentation I had given in January, so unless there=s

more questions about that. One of the issues that we have to deal with is timing and schedule and Teresa is very concerned about this because we're dealing with a need to calibrate the hydraulic models, what generally flows in the target range of a spread between 1,000 and 5,000 with an intermediate point to calibrate your rating curves.

Depending on the inflow, we asked for a managed flow, if the inflow is only 1,500 and we asked for 5,000 for five days, I think the reservoir people are going to be a little bit upset and that could be a problem if you're then asking for 1,000. You've got travel time issues and all sorts of things like that.

So, I don't have a definitive forecast as to when we're going to be out doing the hydraulic data collection. Very clearly before we can go out we have to have the transects and we then have to have agreement on the placement of the transects. It would be nice if we could tie that in to the same trip that we start gathering the hydraulic data because then when the transects are in we start collecting data immediately.

That's going to be subject to the rainfall patterns and it might actually be a while depending on what the rainfall is before we can reasonably expect 5,000. We weren't able to do it up until now because of the small mouth bass spawning criteria in the lake and

the existing operations of the project to protect fish species. So I think the small mouth bass spawning limitation goes until the end of May.

TERESA ROGERS: Then there=s some downstreams concerns with spawning, so we=ve got to watch that.

TOM PAYNE: Right. Then I just found out that the strongest correlation between small mouth bass populations and flow has been the average flow in July. So if we mess with the flows in July we could mess with the population. I=ve got to be careful of that.

Over the years I=ve done these instream flow studies I think that I have personally killed more fish by doing the studies than the project has affected over years. I don=t want to do that. I desperately avoid that. I don=t ask for low flows of a great magnitude for very long at all.

BILL KITTRELL: There=s bound to be a window though at the end of May, beginning of June.

TOM PAYNE: Yeah, but that=s --

JOHN COPELAND: We have --

TOM PAYNE: Two weeks and we haven=t taken the transects.

JOHN COPELAND: April 15 to June 15.

TOM PAYNE: If everybody agrees with my proposal we=ll got out next week and take transects.

TERESA ROGERS: So we definitely know it=s after June, right, for the lake. So do we want to get a little bit better feel after the other transects locations have been identified and we=ll look at the inflows then and look and see if we see a window?

TOM PAYNE: I=ll write up a proposal for our transect placement as soon as I possibly can to get it out there for consideration and review and try to accelerate that to have a maximum window for the flow data collection.

TERESA ROGERS: Let=s get that part behind us.

TOM PAYNE: I couldn=t do that because due to habitat mapping --

TERESA ROGERS: Cross our fingers we can find some flow.

TOM PAYNE: We=ll just hope for a hurricane. A small one.

TERESA ROGERS: I mentioned this yesterday because we were talking about flows for the fish entrainment and impingement, I=ll have to get something out because of downstream

recreation so people are aware we're going to be modifying flows so everybody has a heads up as soon as possible. That something is going to be different year than what they're typically used to in a regular season.

RICK ROTH: How would you get that out, just through these groups?

TERESA ROGERS: Through these groups, through some public notices, target, because I've got several downstream recreation groups in the work groups, I'll target them, anybody I know. If you all have any suggestions also. If there is any good way to get information to Virginia Tech students since they recreate a lot of times downstream at McCoy Falls, let me know.

BILL KITTRELL: We've got an online outdoor -- a lot of anglers are using.

RICK ROTH: We could make an announcement at the symposium.

TERESA ROGERS: The only thing is I don't know when it's going to be.

RICK ROTH: Okay. Well, if you know by then give it to me and I'll make an announcement.

TOM PAYNE: As far as the schedule goes we pushed

the dates for the mapping and the hydraulic data collection, the rest of this is pretty much on target as far as the requirements of the licensing process.

TERESA ROGERS: Well, let=s go ahead and break for lunch. Be back at 12:30 when we will start with aquatic resources assessment.

[Luncheon recess.]

TERESA ROGERS: Let=s go ahead and get started just so we can stay on track with the rest of the day.

Aquatic Resources Assessment

KRISTI MILLER: I guess we=re going to go ahead and start. We=ve still have a couple of stragglers but maybe they=ll make it in. My name is Kristi Miller. I=m with Devine Tarbell & Associates. We are doing the aquatic resources assessment study.

This study comes as three different components. One is fisheries portion. The fisheries, this is going to be only desktop literature review but it also includes a hydrodynamic model, which is kind of in association with the water quality study. I=ll get into that in a little bit more depth here in a second.

The mussels component includes a lake wide survey, a downstream survey in the 57 mile stretch from the dam to Glen Lyn

and also an observation during draw down to estimate mortality. The third part is the Fringed Mountain snail. At this point in time this only requires a field reconnaissance, which has already been completed and I'll talk about that in just a second.

This is just a scope, I believe pretty much the same as most of the other studies, from Allisonia down to the 460 bridge in Glen Lyn is our area, except for the Fringed Mountain snail included is some of the project parcels, or actually all the project parcels above the 1850 contour.

We'll start with fisheries and this is probably the one that has had the least work done on it so far, partly because in order to get all our dynamic stratification model going we have to work with water quality and as they get data we'll put it into a model.

Let's see, the objectives here are desktop study of current and past fishery. We're going to quantify the deep water habitat for striped bass. We're going to create a dynamic stratification model, characterize the plankton and then give you an assessment and a report.

So, as I said, not a whole lot has been done so far but the fisheries portion we have started to gather data from DGIF. Bill had been good and given us a lot of data and I've got a map to

show you of all the points that are reflected so far. We're also looking at scholastic papers and relicensing studies. John just gave me some good information that we're going to put in there as well.

The mapping portion, we will map out all of the known locations, anything we can get to put on a map we will give you. What's been sampled in the past, what species were found there, analyze some trends if we can if some of the sampling locations match up. So we'll put together as many maps as we possibly can with the available data.

Did you have a question?

UNIDENTIFIED SPEAKER: No.

KRISTI MILLER: Okay. I thought I saw your hand.

I know this is a really big map really far away so it's hard to tell but this is just showing the data that we have so far, mostly from DGIF. You cannot read this at the bottom but Copeland's fishing and gill netting locations are color coded in different dots there and then DGIF also has a database that can show you, if you give them a coordinate they can show you a one mile, two mile radius, whatever, of the species that are known to exist there. So we're using that data as well.

Of course that goes from Allisonia --we have some that

are upstream of Allisonia which we'll probably include because, I mean, they'll interact and that goes down to the Glen Lyn bridge. This is not going to be a final map. This is just to show you what we've collected so far. We hope to get much more information than this.

The second part of fisheries is the dynamic stratification model, the CE-Qual-W2_model, which we call the W2, is a two dimensional hydrodynamic model and it simulates velocity fields, temperature and water quality in the lake.

As we all probably know there is a summer temperature oxygen squeeze that is occurring in Claytor Lake and this model -- I don't have any of the printouts from the past modeling that we've done, but it will give you a 3D or a 2D view of exactly what's going on, where the DO is, where that squeeze is and we are going to be able to take all the water quality data from this year, plus we have historical data that Normandeau has just provided us and put those in.

So the next steps are we're going to calibrate for the temperature of 2007 that's being collected now and then calibrate for nutrients, assemblages and organic matter and oxygen products and DO using the historical data.

Any questions on that? Don't know if I can field all the questions on that. I'm not the modeling expert but that's what we're going to do.

RICK ROTH: I have a maybe a dumb question. So I have a good understanding of how the stratification works how is that going to affect dam management or how is dam management going to affect that?

TERESA ROGERS: At this point I don't know. I mean because this is the lake. I mean as far as looking for future operational type thing just sort of speculate if anything could change. It's more of an understanding what's happening at this point. Trying to get it on our head of what is actually happening out on the lake.

RICK ROTH: Given that there is this squeeze I'm just wondering what changes could potentially be made with operation that will affect that.

KRISTI MILLER: It's hard to say at this point.

BILL KITTRELL: You know, there are situations at other projects where you had a temperature DO squeeze and I know utilities don't like to hear it but sometimes when you're pulling water at a certain level and sucking out that habitat you may have to

actually spill water from the surface and preserve some habitat or some, you know, changing some areas where withdrawing water may be an option if you want to preserve, you know, habitat, certain types of habitat in the reservoir. I mean, there may be changes like that that we could talk about.

KRISTI MILLER: We'll give you -- actually the sub that we have helping us with this model has done many of these in the southeast and they have a lot of data on what they've found in other reservoirs and what the management considerations were, so we'll give you all that stuff in the report.

MARK HUTCHINS: One of the water quality tasks was to evaluate potential mitigation measure, operational mitigation measures that could enhance downstream water quality. I don't think we were talking about in lake water quality but certainly that could be.

KRISTI MILLER: The mussel portion we are --

PAUL ANGERMEIER: Before you go to mussels, just reviewing the study objectives and the first two objectives for fisheries say things like evaluate fish species, assess existing fish population from both the lake and the river downstream, I just wondered, could you tell us a little bit about what that will mean?

When you evaluate and assess is that more than just saying that they're there?

KRISTI MILLER: Yeah. We are getting as much historic full data as we possibly can and if we, you know, are finding X sample location has been sampled year after year after year we're going to look at those trends. If the same fish are there, if they're not.

I know it would be more useful you think probably a lot of you who are out there actually doing the elect fishing this year, but we have all that data from DGIF because they are there a whole lot, so we're going to evaluate as many trends as we can. We're going to analyze the data as much as we can of what is available.

PAUL ANGERMEIER: I'm not hearing -- trends in what? All you're saying now is that you know where they are, you're not saying anything about what kinds of trends would you look at?

KRISTI MILLER: What species composition have changed at which sampling points over the years.

PAUL ANGERMEIER: Okay. So any population measures?

KRISTI MILLER: If that data is available it will be

compiled, but as I said, we only have --the data that=s available is all we have to work with because we=re not taking any data this year during this study as far as field surveys go.

PAUL ANGERMEIER: When would you know what kinds of analysis would actually occur?

KRISTI MILLER: Okay. We=re still collecting data right now. We=ve been talking with DGIF the last few weeks getting that data. We don=t have it all together yet. When we do have all the data together I=m sure that we could call a workgroup meeting, discuss what we have, what you guys would like to see done with the data that=s available.

At this point, like I said, the fisheries has the least amount of work complete on it at this point, so we are still trying to get data. John just gave me a report this morning that we hadn=t even seen yet. So when we get all that together we can work that up, call a meeting, see what you guys want to see done with it.

BOB MUNSON: Did you say you would not be conducting any field surveys?

KRISTI MILLER: Not for fisheries.

BOB MUNSON: So even if we identified a data gap there wouldn=t be an effort made to answer those questions?

TERESA ROGERS: I think we would wait and see.

JON MAGALSKI: Yeah, if there is a data gap I think we would be able to do that. I think we first would have to identify that there is a data gap of what the existing information is.

BOB MUNSON: That=s what you were getting at?

PAUL ANGERMEIER: Not specifically, I mean that=s one of the things. I=m just wondering what is involved with evaluating and assessing, that=s what I --

KRISTI MILLER: I understand what the question is and I was vague on that. I apologize. Once we get all the data together then we=ll decide what you want to do with it. When I say trends I just mean let=s look at what we can pull out year after year, what=s happening. So that will up to the workgroup.

BILL KITTRELL: What are the three assemblages you=re talking about?

KRISTI MILLER: Specifically I=m not sure.

BILL KITTRELL: Are you talking about in general terms as in zooplankton versus phytoplankton?

KRISTI MILLER: Yes. We will be --

BILL KITTRELL: Or are you talking about some other assemblage.

KRISTI MILLER: I'm not sure about any other but I know that zooplankton and phytoplankton will be modeled, movement will be modeled with the W2. So three -- this is what was given to me from -- their creative model. They say that they can put up the tree assemblages in there if something came up in our literature review and we had the need to model that type of thing it's possible.

This bottom line is next steps is just what we can put in the model. But we will be looking at the phytoplankton, zooplankton movement.

BILL KITTRELL: I know there's planktonic algae versus filament, you know, I wasn't sure what the assemblage, the breakout classification you were talking about.

KRISTI MILLER: Right. And the objectives weren't characterizing the phytoplankton and zooplankton. But if anything else comes up we have the ability to put those into a model. Anything else? On mussels, something I know a little bit more about. We have been out in the field the last two weeks starting on a lake wide survey. So we've got some preliminary data that we can show you here in just a second but first the objectives of the mussel portion is a lit review to look at past papers and sampling done by the state. A sampling protocol, which was written and

submitted two or three weeks ago. Got some feedback from the state.

At this point we just lately this week, we have come up with a possible small methodology change. If that=s agreed upon we will revise that sampling protocol to reflect those changes and resubmit it, but that=s the -- the first draft of the sampling protocol is available.

TERESA ROGERS: I sent out those proposed changes to the workgroup. I don=t know if anybody has the opportunity to look at them or not but I know Brian provided some conference. Do we need to -- I guess we need to decide pretty quickly if we=re going to propose the changes because they=re out in the field right now.

KRISTI MILLER: Right. I=m going to describe in depth what those changes would be in just a second. So that=s the lake wide survey. Then later this year we=ll be doing riverine reconnaissance where we will be actually floating the 57 miles mapping habitat. We will also look at the extent of the project up into Wolf and Walker Creeks and then we will go back and actually survey the areas of good mussel habitat and get you some data.

Then the reservoir draw down will be in November, I guess, that=s when it usually happens. We=re going to go out -- this

is still slightly up in the air as well as of our conference call. Right after the draw down we will go out and walk the shoreline, then right before they fill up we will go back, walk the shoreline again and look at mortality. I have the methods in greater detail than a couple of slides here.

So with the lake wide survey, which is ongoing now, we chose ten sampling areas along the lake. We put five on each side of the lake. These were all chosen on access, topography. As you all know, a lot of the lake is just straight down, rock wall, so we looked at the topography and access roads and chose these ten sites without ever seeing them. So one of these sites have been slightly moved already but these are the general beginning sites for our lake wide mussel surveys.

We also wanted to put two of our sites, two out of ten, on sites where Brian had told us that there were greatest mussel densities in past studies so that we can not be bias but so that we can get a better representation of what=s there.

You=ve probably all seen this before, it was in the sampling protocol. This is how we have our quantitative sampling set up. If this were the shoreline here we would have two rectangular sections, one within the zero to five feet to represent the dewatered

area, the area that's drawn down to fall and then another rectangular section in the watered area five to ten feet.

Within each of these rectangular areas we will be sampling 200 quarter meter square quadrats with three random starts per rectangle. It's easier to see it done but it's kind of hard to explain. So, 200 quadrats in the dewatered, 200 quadrats in the watered, a total of 400 together per site, ten sites, 4,000 quads total across the lake.

From our early sampling last week and this week we are seeing extremely low numbers in the dewatered area. So like Teresa was saying, she sent out a note to everyone to say, hey, we're finding with the quantitative work and the dewatered area we're finding maybe one to five individuals per 100 or so quadrats. Very low numbers.

In addition to the quantitative work that we're doing we're also doing qualitative work, we're doing one person hour of scuba per dewatered and watered section. So throughout the qualitative work in the dewatered area also we're seeing very, very low numbers.

So we had sent out an email earlier this week to propose, go ahead and do the qualitative work in the dewatered

area, it seems to be more telling sometimes since you're getting a full coverage look, if we find less than 50 individuals in the dewatered area go ahead and move all of the quantitative work into the watered area because there are many, many more mussels in the watered area as we're seeing so far.

PAUL ANGERMEIER: Remind me, what is the purpose of this comparative, the comparison --

KRISTI MILLER: Well, the reservoir is drawn down once a year five feet, about five feet, in association with the lake wide survey we're also doing a draw down survey, so to give us a little extra data on how the draw down is affecting the mussels in the zero to five feet we wanted to look at the zero to five compared to the area that's always watered. How are these populations being affected yearly by the draw down.

So this area right here is dry for about 20 days a year. So while it's filled up -- this is all done while we're at full pond, not during draw down. So we're seeing if mussels are recolonizing up in that area, if they're totally gone, what's going on with them during the watered times of the year.

PAUL ANGERMEIER: Are you excavating these sites to certain depths --

KRISTI MILLER: Yes, we=re excavating to ten centimeters.

PAUL ANGERMEIER: So that you=re not missing things.

KRISTI MILLER: I have a picture of a sampler but if I could just describe it. We=re laying down, for each one of these quarter meter square quadrats we start with a random number and lay down a square, you know, get a scuba guy down there or snorkeling, whatever the depth is, excavate completely into a metal sampler, which is a box that has holes in it, excavate completely the quarter meter area, you pull up the sampler, shake through it, look, go through everything you=ve got, anything you=ve got you take a length.

We=re also getting records on corbicula, not that we care too much about lengths on them but we=re getting whether they were rare, common, uncommon, abundant in each one of the quadrats. So, I=ll just show you the sampler.

So this box right here is just pretty much a mesh and you just take -- there is the quadrat right there, lay down the quadrat in your area, excavate everything in the sampler, pick it up, shake through it and then go ahead and roll the quadrat over to the next

site. We're doing every four up until we get to 200. So you roll it four times, go to the next one and then three times per area we start with a random number again, three random starts.

I know it's confusing. Do you have any questions on that method? So that's the quantitative work.

BRIAN WATSON: What's the size of that overall, is that like 50X100 meters roughly?

KRISTI MILLER: When we get to the site we go ahead and get out to five feet, take a depth of five feet all the way across and lay out a line parallel to the shoreline at five feet, then from that one we go out to ten feet and lay a line down, it doesn't matter how long the line is we just start with, you know.

So we've got one at five feet, one at ten feet. We go ahead and start rolling the quadrat every four and then just keep on moving that five foot line over and the ten foot line over until we get to 200 in the dewatered area and 200 in the watered area. So it's been, I don't know, 30 meters wide so far, it just depends.

Then the qualitative work in each one of the areas is just one person hour of scuba. Take a mesh bag out, scuba, everything you find, every mussel you find pick it up, put it in the mesh bag, come back. We do it 20 minutes at a time, so you go out for 20

minutes, scan, fill up the bag, bring it back, go back out for 20 minutes directly, pick up anything else you see. By the third time you get out there, it's a depletion survey, by the third time you get out there you're not usually finding anything. We've got a pretty good idea that we've got full coverage for the qualitative work.

So, the proposal on that was, I can show you, put this in there to show you what we've been finding. So far we found four native wild species and then you can see the *Lampsilis*, *Avada*. We've only found one shell. So we've got five species, four alive, one shell of the native and then we're finding *Corbicula* a lot. But the *Pyganodon grandis* are abundant, the *Cyclonaias tuberculata*, are actually probably the second most abundant that we found. The *Eutrombicula* and the *Bacillus* are about equal with the *Cyclonaias*.

Then we have *Tritogonia verrucosa* that we're finding as well and not that abundant. Probably the least most abundant that we found. I'll leave this up for a while because I know there's a lot going on here. This is just some preliminary findings. I really can't draw too much from this but our sites are lettered so we've gotten almost through A B and C. The green, these two here, show you what the qualitative work is giving us.

The qualitative is when you get down there and scuba

for an hour. The orange ones are the quantitative work, the ones where you're actually doing the quadrats and then this yellow colon, I'll talk about that in just a second, forget that's even there.

So you can see in the dewatered area, DW over here the left two, we're really not getting much in the dewatered area so far. We've got nine from the qualitative work and we haven't gotten any from the quantitative work in the dewatered area.

So after three sites we've only found nine individuals in the dewatered area. Hence our proposal to scan the dewatered area first, if we find less than 50 individuals move all the effort to watered area. So that's open for discussion.

BOB MUNSON: Are the mussels that you say you're only finding a few of more common in shallower waters, waters that would normally be dewatered?

KRISTI MILLER: The ones that we're finding low abundance like the tritogonia.

BOB MUNSON: Yeah.

KRISTI MILLER: We have -- we're taking notes on everything like that. Those target species, the tritogonia or the pistol grips, we have depth on everyone that we've found and they have been most abundant between seven and ten feet. The nine mussels

that we found in the dewatered area over there, the pyganodon, eutrombicula, those have been between four and five feet. We haven't found a single individual from zero to four feet yet.

So I'm not going to draw any inference from that yet but, yeah, they're not too fond of the real shallow part, as we can tell so far.

BOB MUNSON: Would you have a -- you wouldn't have a shallow spot that wasn't dewatered though; right? When you drop the lake down it would be, all your shallow spots, that's my assumption here --

KRISTI MILLER: Right.

BOB MUNSON: Is that the species that you're not finding many of may be shallow water species that can't survive being out of water for --

KRISTI MILLER: All of the target species, the pocketbook and pistol grip and even --

BOB MUNSON: The one in that slide that you showed a little while ago the one that was top left, that was the one you said you weren't finding very many of?

KRISTI MILLER: The tritogonia we're not finding much of. I didn't even put a picture of him up. We've only found a couple

of live individuals I just don't have a picture of him, but he's the pistol grip. Whenever we do find even shells of pistol grips, pocket books, purple wartybacks, the more rare mussels, we are making note of where we found those shells.

We haven't found these shells in the dewatered area. All of the tritogonia shells have been in the five to ten foot range. So there aren't many shells except for corbicula in the zero to five so far.

So onto this yellow area here, we decided it's only going to take an extra 15 minutes a day while we've got a guy in scuba gear we are doing a straight line from the ten foot extent out to the 30 foot.

Our diver is going down, making a straight beeline from ten to 30 feet, looking around between his arm's length and picking up, just touching but not actually pulling up to the surface, taking counts of what he sees out there. We think that that will be supplemental to possibly the dissolved oxygen issue. We want to also see where we're getting the most abundance there.

So you can see how many we've seen in each area. It's very telling and only takes a few minutes just as a little qualitative overview. But we're seeing in between 20 and 23 feet is

extreme abundance and then they kind of die off a little bit after that. It=s just extra information. Just, you know, something to put in the report, maybe analyze just a little bit.

Any questions on early findings?

BRIAN WATSON: On those straight lines, Kristi, how long is the actual linear distance?

KRISTI MILLER: We were at a site yesterday up close to the dam on the right descending side, we actually talked to a landowner and she said that it used to be a field, they had to move the house up the hill because the house was on the field when they filled up the lake so it was very shallow. It was probably -- we were about halfway out in the lake, out in the main stem before we got -- and we only went to about 25 feet because of the boat traffic, just couldn=t have a diver down there, but in some other areas it=s only been about 15 meters or so before you get down to the 30 feet.

BRIAN WATSON: Have you guys taken approximate distances on each of those --

KRISTI MILLER: Uh-huh.

BRIAN WATSON: I just wondered if you=re by our -- about a meter or two meters wide you can get some kind of crude estimate in --

KRISTI MILLER: I actually asked that question yesterday to John before I came here, I said is there any type of what I can tell them what the methodology is because I'm not the diver, I'm not down there, I can't see what he's doing. He said as far as he could reach his arms he can touch it when he's in a straight line, so we're getting a lot of results from that.

BRIAN WATSON: It would be a true comparison at least quantitatively to what you're seeing in there compared to the actual quadrats and dewatered and watered areas --

KRISTI MILLER: Right. Yeah.

BRIAN WATSON: Comparison between the three different areas?

KRISTI MILLER: We're not getting lengths on that stuff it's just counts but, yeah, it's only like 15 minutes. I think this is my last slide for the lake wide mussel portion, so if there is any input on moving the effort from the dewatered into the watered that would be great.

BRIAN WATSON: I guess my only concern about doing no quadrats in the dewatered area is that then you're comparing a qualitative method to a quantitative method even if you do the search and you find less than 50, I guess the purpose of doing a quantitative

was to have a comparative method between those areas and have an idea of what densities may be like and what the impact in that dewatered area would be and if you're not doing any, it may not be that you need to do 200 but there may be another lower number in those areas that you could do maybe 50 --

KRISTI MILLER: Twenty percent would be 40 --

BRIAN WATSON: And shift the other quadrats out to the watered area at least so you'll have the same methodology. It may not be the same numbers but we talked precision when we had the conference calls, if you run those, say if you did 40 in the dewatered area and you're finding nothing the precision would probably still be relatively good because the variance is going to be low if you're getting all zeros. So at least you've got quantitative information that says, that backs up qualitative because some may be subservient and you can just do the digital.

KRISTI MILLER: Okay. I see what you're saying. We were wondering as well what type of objective, you know, what you guys wanted to see from this because if you don't really want to compare the dewatered and the watered then you get more idea about abundances across the lake from focusing on water.

BRIAN WATSON: I think it would probably be helpful

from some of the other stuff that's going on with the concern of the draw down to have an idea abundance wise what might be in that water. To have some quantitative data even if it's not 200 quadrats, maybe you target 40 and see where that is. If you're getting zeros all the zeros the percentages should be pretty good that your variance is going to be real low.

That would be my recommendation is maybe try that as an adaptive method and then shift the number of quadrats depending on what you're seeing in those locations. Maybe if you get to an area -- I don't know exactly where you've done these with the no mussels in the dewatered area but I know a couple of sites I gave John like Mallard Point and Larry Bandelin's place, unless this year is different than past years there should be some, you know, in the past years you were seeing high numbers in those areas from dewatered so those areas maybe you may need to need to do 200.

KRISTI MILLER: Okay.

TERESA ROGERS: Do you want to write up what we just discussed and we'll send it back out and make sure we're --

KRISTI MILLER: Yeah, I can write that up but he just now said it might be adaptive so I'm not real sure if I'm clear on what -- if we were to set a number 50, 40, whatever, go with that but

if we come up with something or they're more dense in the dewatered area would that be just like a --

BRIAN WATSON: I would probably say if you do the qualitative assessment and find less than 50 in that hour and then want target 40 quadrats.

KRISTI MILLER: Yeah, okay.

BRIAN WATSON: Do that and I guess John can look at the precision based on the calculations, you talk with him and if it's within that range let me know. If it's around 25 percent we would be happy with that.

KRISTI MILLER: Okay. And from the qualitative if we find more than 50 go ahead and run the full 200.

BRIAN WATSON: I would probably go ahead and run it. I would go ahead and run it.

KRISTI MILLER: Okay.

BRIAN WATSON: If he's setting the site at Mallard Point and at Larry's property those may be ones you want to maybe target for the 200 based on what we've seen in the past years, unless something has changed this year.

KRISTI MILLER: All right.

BRIAN WATSON: I know we were at Mallard Point this

past winter, I didn't see as many as I did previous years but there were still a fair number at Laura Bullard's property as well as the back cove areas.

KRISTI MILLER: Makes sense to me. I'll get that written up. Yeah, because we're out in the field like today, tomorrow, I would like to go ahead and get something --

BRIAN WATSON: There's probably going to be a real hit or miss depending on the sites of those dewatered areas. Some sites we sampled when we did the draw down survey a couple of years ago we struggled to find a hundred mussels walking along shoreline distances and marking other areas we found them with no problem.

KRISTI MILLER: Sounds doable. We're about to go on to riverine mussels if anybody has anymore questions on lake wide.

This portion has not begun. We are going to do a field reconnaissance probably July or so. We're going to try to go through a low flow time so that we can see the habitat. We will go float down the 57 mile stretch and we're going to target green floater habitat but also look for other mussels in the meantime.

The area of project influence, like I said, on Walker and Wolf Creeks will be determined and mapped and then those areas of

project influence will be included in the area that we recon and sample. After the recon we will provide habitat maps. I'm going to get with Tom Payne and use the same criteria that he's using so that we can --

PAUL ANGERMEIER: How are you identifying these habitat areas to map?

KRISTI MILLER: We're going to use bathyscopes --

PAUL ANGERMEIER: What criteria? How do you distinguish green floater habitat from not green floater habitat?

KRISTI MILLER: Okay. Green floaters have a specific type of habitat. I'm working with one of the southeast experts in green floaters, he's out in the field today. He's worked with them many times. I'm not exactly sure -- they've been silting some interstitial gravel as far as I know.

MIKE PINDER: It can be, you know, ripple run habitat. It can vary depending on the size creek. In the New you find them out there more like more run habitat, sandy, substrates.

KRISTI MILLER: Yeah.

MIKE PINDER: And so tributaries we find them in more slow, slack waters, cobble gravel, so it varies depending on where you're looking on the size of the water body.

KRISTI MILLER: Yeah, it=s going to be a pretty slow flow. We=re going to have bathyscopes and snorkel gear during the reconnaissance. Anything that looks halfway inhabitable by the green floater we=re going to get out there and use our viewfinder, snorkel and mark those areas and make those target areas to come back to when we do our sample.

PAUL ANGERMEIER: And this is during the summer?

KRISTI MILLER: Yes.

PAUL ANGERMEIER: Would it be possible to map vegetation?

KRISTI MILLER: I guess I could make a note. Yeah.

PAUL ANGERMEIER: I know it=s not entirely related to this but it came up this morning.

KRISTI MILLER: Right. Yeah, I had already talked to Tom about trying to get our two habitat maps together and while I=m out there I can definitely make a note of --

PAUL ANGERMEIER: It=s going to be a slow flow; right? You could just draw where the stuff is --

TERESA ROGERS: What kind of vegetation are we looking at?

PAUL ANGERMEIER: Rooted vegetation.

TERESA ROGERS: I guess I want to make sure we're specific. I mean is it everything that's underwater or water willow type things or -- what are we trying to target and why?

PAUL ANGERMEIER: I'm not sure. I guess my sense would be everything because I don't have a sense for what's out there. But I'm pretty sure that all of those vegetative beds are going to be critical habitat for young and small fish as well as some of the insects and crayfish and things like that. As an important descriptor of what's good habitat. It seems to me we need to know something about the distribution of that vegetation.

TERESA ROGERS: I guess I'm just trying to relate it back to study objectives and project nexus. That's what I'm trying to figure out.

PAUL ANGERMEIER: Well, habitat suitability is what it is. Characterizing suitable habitat for not the critters that Kristi's talking about so much perhaps but that fuller list that we talked about this morning.

BILL KITTRELL: It may not be even as important for the submerged aquatic macrophytes may not be as important really to know specifically what species it is other than the fact that it's there and how dense it is.

It would be very time consuming if you try to groundtruth all the beds that are out there as you're floating and try to get a, you know, obviously it would be good to have identification of dense macrophytes versus, you know, moderately dense versus lightly colonized or whatever, that may be useful and it wouldn't take as long as trying to identify all species you encounter.

KRISTI MILLER: What I've done in the past I have had reconnaissance float trips. We have a really nice data logger, GPS. I'll put in anything I can possibly see out there and as I'm floating by I'm checking things off of what's around, making lines as I go if I'm in a run or riffle or whatever and switching everything up as I go.

We usually have imbeddedness on the data logger. If they're very imbedded, if it's imbedded in vegetation I will definitely make note of it. That's just something that we're going to do anyway. If I come upon a huge vegetation bed I'm sure I can make a note of that. I mean, it's not really going to have to be an extra effort because --

BILL KITTRELL: Tom, would that be useful in terms of what you need in terms of mapping or not? I'm not sure.

TOM PAYNE: When are you going to be doing this?

KRISTI MILLER: July.

TOM PAYNE: Part of it ties back into when we're going to do the fieldwork for the hydraulics for the instream flow. I don't have a good sense for that right now. It could be quite a while if we don't get some inflow because if we're going to be providing our high flow for any length of time then we're into reservoir draw down problems, tradeoffs and then we have to fill the reservoir back up so that means you've got to drop the flow down below so it's a high flow low flow, so you have to have a fairly reasonable inflow.

If you're below about 2,500 then I don't know what the threshold is until you start running into problems. So it would be nice for our transect placement if we can get this data before that, but since I don't know when we're going to collect the data I can't be sure that they would have that information.

But I would say that as far as the best situation it would probably be best to have the information to help identify areas where we might want to have some transects, based on her survey data.

BILL KITTRELL: That would be more detailed than even, you know, for example, coming to us and saying where are the dense vegetation coverages because then we would just probably be giving you a general area.

TOM PAYNE: And you probably know some areas

better than others.

BILL KITTRELL: Yeah.

TOM PAYNE: It would be really useful if it could be done before we do the transect selection.

BILL KITTRELL: Just refresh my memory, would you take that and do like a percent frequency similar to the other habitat types or would you just use it for locating transects?

TOM PAYNE: Probably by locating transects so that we do have some hydraulic data in areas where the species occur. We can look at those in more detail as we do the analysis. It would be very difficult to do it on a representational basis because of the variability that would be likely to be encountered.

BILL KITTRELL: Basically just for developing transect locations that would be using --

TOM PAYNE: To make sure you cover those types of important areas.

TERESA ROGERS: As you're doing this part of the field recon you'll be noting what you observe?

KRISTI MILLER: That's really not any extra effort for me. All we have to do is just put a couple drop down menus and day logger, check things off. If I run into something new I'll make a note

of it. It's not a big deal. It will just be qualitative, you know, there's a big batt of pond weed here, something like that.

TOM PAYNE: Have you got your strategy down for whether you're going to go down the middle or the left bank, right bank or go back and forth?

KRISTI MILLER: Nope, hoping to get your habitat mapping first and look at that.

TOM PAYNE: Because the river is brutally wide.

KRISTI MILLER: We'll be looking into that before July.

BILL KITTRELL: Did your folks use a jet boat?

TOM PAYNE: No, that would have been nice. That's what everybody else had. We had a lake boat with a short shaft outboard on it. It worked okay --

BILL KITTRELL: Went through a few props didn't you?

TOM PAYNE: No, we only dinged it once. It's AEP's boat, we had to replace the prop. The water was really clear and we were going really slow basically drifting and whenever there were any problem areas they tilted the motor.

JOHN COPELAND: We certainly want to see where water willow beds are.

KRISTI MILLER: Okay.

JOHN COPELAND: We want that.

KRISTI MILLER: Yeah, I remember that discussion, you guys were interested in that so. Then after reconnaissance we will, if available, if we find six areas of the best green floater habitat we'll sample those and get CP read on those in a separate effort after doing reconnaissance and of course as we go along if we see any dead muskrats we will pick through them and look for shells.

MIKE PINDER: Dead muskrats.

KRISTI MILLER: Yeah, muskrats. That=s all the same. So that will start in July. Then the draw down observations will occur during probably November, walk across the exposed shoreline in six locations. This is the original plan, six locations, at least 12,000 square feet for each location, write up the draw down and then percent mortality will be based on past surveys.

That=s what we had originally proposed and then Brian brought to our attention that it may be more useful to just go to four locations right after draw down, look at what there is there 12,000 square feet each and then go to those same four locations right before they fill up and get exact numbers of how many have disappeared in that amount of time.

That=s on the table right now. That=s not going to occur

until November so I think we have a little bit of time to discuss that further. Then the mapping that will go -- I'm sorry.

RON POWERS: Are you going to make a recommendation for a time frame for the draw down that best suits your --

KRISTI MILLER: For this year?

RON POWERS: Yes.

KRISTI MILLER: That's totally not up to me.

TERESA ROGERS: We typically look at weather, inflows to figure out what's best and consulting everybody. They'll definitely be in the loop, we're going to start talking about that. I think a lot of the surveys are going on during that period as well. I guess we want to try to still have as little impact on recreation during that time as we can. A lot of it will depend on what's going on weather wise at that time. But we do need to have a draw down for the studies.

TOM PAYNE: It is conceivable that if it continues to be dry and there is no tropical storms that we may have to tie our hydraulic data collection to the reservoir draw down working in November.

BOB MUNSON: It's always sunny and warm in Virginia.

TOM PAYNE: Daylight is the issue. You don't have a lot

of daylight hours. So anyway, that could be possible.

KRISTI MILLER: The mapping, after the draw down we will give you locations and conditions of all the mussels that we are doing the target, pistol grip and pocket book mussels and we'll give you separate maps of those because those are the more rare species.

You'll get an estimation for exact number of mortality in this as well. Just review of progress to date, we've got the sampling protocol out but it will be resubmitted with all the changes that are being made.

Lake wide survey, we began sampling last week, it will continue through the beginning of June. We found four live native species in the three sampling areas and then the riverine and draw down have not begun yet but we've started literature review for both of those.

Finally, our fringed mountain snail, this is a federally endangered species, very hard to come by literature on this animal. All that's known pretty much is that one or two live species or individuals were found right down by the dam many years ago. Since then only a shell has been found in past surveys.

So the objectives here included literature review of

anything that=s available, mapping, past locations, full field reconnaissance of the project parcels, AEP=s project parcels above that 1,850 contour, a recon report and an assessment.

So, let=s see, the literature review was performed. We created maps showing the known locations of possible or past shells and the individuals that were found and then we also already submitted the recon report. This all took place in April but because of the sensitivity of the endangered species I won=t share the information that=s included in that report until AEP decides to do so.

So this portion is pretty much finished except for just the distribution of the recon report to show you what we found.

TERESA ROGERS: I=ll be contacting official wildlife and asking them who we can share this information with, who needs to be consulted because I don=t know at this point.

BRIAN WATSON: Can we get a copy recon report before you --

TERESA ROGERS: Before?

BRIAN WATSON: Uh-huh.

TERESA ROGERS: I kind of look at this as almost like a cultural resource thing where SHIPO tells me who I can consult with and then I don=t know if you all have ever dealt with this before --

BRIAN WATSON: Well, I mean, legally we have just as much authority --

TERESA ROGERS: I would think that you guys would be involved too with that.

BRIAN WATSON: We would have to get a copy of the report. The Official Wildlife Service could not say we cannot have a copy of the report.

JOHN SMITH: My comment on it earlier was just for the whole group, the stakeholder group, you know, you might want to get clearance from them.

TERESA ROGERS: We=ll provide copies.

KRISTI MILLER: As far as the reconnaissance, that was performed. Ken who is the expert came down from Maine and we went out and did reconnaissance of these areas. There was no excavating done. We did take note of other snails that we saw on the surface while we were out and this is all included in the recon report.

Schedule is black line, shows current here so the next thing coming up is putting in past data that we got from Normandeau into the W2 model and then reconnaissance I have in July for the downstream mussel part and then immediately following that will be the riverine mussel survey, water calibration and input into the model

after that and then draw down mussel survey in November.

The first draft of our report is expected to be out in February. That=s all I=ve got for you.

RICK ROTH: How about the hellbender?

KRISTI MILLER: There was a change in the study plan and the hellbender is no longer associated with this study.

RICK ROTH: It=s in the revised study plan.

TERESA ROGERS: When it came out, the determination that came out it was removed at this time assuming that some of it can be -- well it can be addressed under instream flow needs. John had only today that if they can=t then that might be revisited.

BILL KITTRELL: You know, there=s probably in your literature search for fisheries information in the lower New, you=ve got, you know, a lot of information on sport fish for example but limited information on population estimates and so forth, non game fish.

John=s got some from completion sampling we=ve done on the lower New, what if you found, I know it=s early but have you found supplemental information on non game fish in the lower New?

KRISTI MILLER: The only information we=ve gotten on

non game fish so far is from your all=s database. You can just give a coordinate and get back within a radius what fish were there, who found them, how many did they find, that kind of stuff. That=s all we have on the non game so far.

JON MAGALSKI: We have some information too on that from our 3/16 studies. I think Glen Lyn had provided the report from >78 and we -- I=m in the process of obtaining from our consultant from last year=s and this year=s river survey and I=m trying to put my hands on a study, I think it was in the >70's or >80's, erosion study on the New River. I just need to put my hands on that report.

JOHN COPELAND: There=s a couple of PhD -- some dissertations in the Tech library. I think they=re preliminary to your -- down that section of river.

JON MAGALSKI: Before?

JOHN COPELAND: It was late >70's.

JON MAGALSKI: I think those are from the original 3/16 studies.

BILL KITTRELL: In that database that we had you=ve got to be careful with that because you pick up so many tributaries with these things, you know, because of the one mile, two mile radius thing.

KRISTI MILLER: That=s why we had to just choose just areas where we wouldn=t get any tributaries, so that data is kind of patchy as far as what we=re getting back from there. We run into that problem in the beginning.

JON MAGALSKI: I think the other source might be -- I don=t know what kind of data they have. Check with Larry.

KRISTI MILLER: Any additional data we would very much appreciated you have any. Anything else?

Recreation and Angler Use Study Update

JOT SPLENDIA: I=m going to start. We=re already running late so if I could get everyone=s attention.

My name is Jot Splenda, I=m with Louis Berger Group. We are working on the recreational use study and there=s a subcomponent angler use study rolled into this. As Teresa mentioned these are update studies. I=m here to give you an update on where we are in the study.

A good way I thought to do that was to brief everybody on the objectives and some of the methodology and as we go through that it will trigger my comments as to where we are and trigger your guys questions where we=re going and things like that.

The overall study objectives have been distilled down on

the slide from a larger list on the study plan down to about four main components where the first objective is to document what the facilities are that we're looking at. What are the recreation access points to the water within the project boundary. We'll call that inventory.

The second part is building on that baseline, collecting information on the users who use those access points, what they're opinions are, their preferences, what types of activities they're doing there and maybe their satisfaction or dissatisfaction with certain aspects of their experience.

Taking that information and building on it further we would make an effort to make forecasts on estimates out into the future and talk about the methods on each of these in a little bit more detail. Again, these are the objectives. The last part is to characterize the boating densities on the lake and trends, the spacial distribution of the boats and talk about the merits of our methods.

Again this is a baseline study that will help AEP understand what the conditions are this year, how many people are out -- estimate how many people are out there this year, what conditions the facilities are in this year, what are people's perceptions on their experiences this year so that they can make a

decision on how they want to proceed into the future.

I'll refresh your memory about the access points around Claytor Lake and where we're doing studies starting at the upstream Allisonia boat ramp here, Lowman's Ferry Bridge, the two commercial marinas, Rockhouse and Conrad Brothers. Across the lake at Harry DeHaven County Park, Dublin public access and Claytor Lake State Park and then below the dam there is an access point at the river.

AEP also operates a picnic facility right near the dam, that is on a reservation basis and we can get the use numbers from that from AEP's records that they keep on group sizes and dates. Similarly we've talked with the State Park and they monitor their own use there through a traffic counter and through the register. We'll use their numbers there.

Allisonia is near the New River Trail State Park, which is a trails to rails conversion that goes along the river through here and into Pulaski. They have a traffic counter at that parking lot that we can use. It's a counter every time a car goes in.

These are the locations where we conduct regular routine visits to doing spot counts and interviews. I'll talk about some of that methodology a little bit later on. We're also

doing sampling on the New River. Here=s Claytor Lake and access points to the river, here are in text Riverview Park, Douglas Landing, Pepper=s Ferry Bridge, Whitethorn, McCoy Eggleston, Ripplemead and even further down there=s Bluff City, Narrows, Rich Creek and Glen Lyn.

These are the public boat ramps that are free to get onto the river. There=s also a lot of disbursed use that=s occurring off the frontage roads between these access areas. I=m going to talk about how we=re going to be addressing that and characterizing that which we=ve discussed in developing a study plan.

It=s the context you need to think about the recreation sites. Now let=s talk about the methods for each of the components.

A little background on schedule. We started fieldwork March 1, people were out in the field. I get into the methods of how often we=re going to be out in the field but we have been collecting interviews and spot count data and traffic count data at select sites since March 1 until now.

That=s going to be ongoing throughout the study through the end of November. That=s the update part of the presentation. I=ll get into some of what we=re seeing out there and have a group discussion on that up until now a little bit later.

So the inventory methods, go out and document baseline conditions at those sites we mentioned. Site visit, recording how much parking there is. This will also be linked to DGIF real estate records or engineering site planning design specification drawings. We'll get drawings that are designed to accommodate, how much parking, what other amenities would be there, would there be picnic tables and shelters, swim beaches at Harry DeHaven and so forth.

To do this through GPS points and photograph them and this will provide the baseline -- the background context so we can evaluate all the interview results against these. Meeting the objective of the existing use. We're going to use a couple of different methods to do that. We're going to do traffic counts, spot counts and interviews at all the public access points on those first two figures.

Like I mentioned, traffic counters will be used -- gotten from the State Park and from Allisonia. We've deployed traffic counters at Dublin access, the two marinas and Harry DeHaven State Park -- I mean county park. Lowman's Ferry and it's not very conducive neither is the Sportsman below the dam.

Those sites are wide open areas where the counter

couldn't capture the use there. So estimated use there is going to be based on spot counts and using a turnover rate, including annual use number there will be on separate methods in the traffic counts, times the group, multiply --

BOB MUNSON: Just one comment on Allisonia, the park counter should only measure those people using the state park parking area and so you may need to do an analysis of what percentage of the -- if there's any relationship at all between those people using the game commission ramp, that are boaters, versus those using the trail, because trail users can't park in the game commission parking lot, they have to park on separate trail user parking lots. There's two parking lots side by side there, one for trail users and one for lake and river users. So for your data to be useful using the park counter won't be very helpful.

JOT SPLENDIA: The counter that I was referring to was right across -- attached to that sign post here. This is the Allisonia boat ramp.

BOB MUNSON: It's right at the entrance?

JOT SPLENDIA: Yeah. The counter is actually on the post here and runs across here. This is -- you can see the trail --

BOB MUNSON: That would be just like you to send the

count game commission ramp users as park users. No wonder he says there=s a million people using that park, they=re all boaters.

JOT SPLENDIA: Right because the actual -- it=s frame of reference. From this parking lot the trail, I=m not sure if it shares the roadway here --

BOB MUNSON: It=s the downstream end and this is the --

JOT SPLENDIA: Right. But then up further there is where the railroad bridge crosses over the lake and there is some shoulder parking and associated gravel area there and that=s where I didn=t notice a counter when I was there last time, but you can imagine the uses coming from here if they=re going to park here and get their bikes out and use the trails.

There is going to be mixed use in spot counts and interviews at the site will help us draw out and estimate that, but, you know, there is going to be mixed use going on. So we are doing spot counts and interviews at all the locations and I=m jumping ahead here. The methods for that I think is on the next slide.

The shoreline residents will get a mail questionnaire. We=re doing this because if you think about trying to get the use of the reservoir you can either access it from the public sites, access it

from the shoreline, in those two areas. We want to find out how many times people are using it or how they're using it and what are the perceptions of the use, if there are any issues that they might have related to use on the lake or activities.

We're also going to administer a regional questionnaire and ask to calculate to help supplement our estimate on regional demand for this particular reservoir and the lake. Now, DCR is in the process of updating new scarp. They've done a huge sampling effort in 2006 and they should be coming out with their new publication in the next six months I hope.

BOB MUNSON: Three months.

JOT SPLENDIA: Three months. So there's some data available to relate regional demand with what we're going to do with our more smaller sampling unit for our regional demand. So we can compare the demand, recalculate Claytor Lake with the local demand rather water based activities in that planning district.

BOB MUNSON: Actually our data is only statistically accurate for the mountain range. It's pressing the Blue Ridge west is the sampling size of our data. I mean that's the -- we extrapolate it down to the PDC or to the county or town level, but this data is 95 percent statistically accurate or 98 percent west of the Blue Ridge.

JOT SPLENDIA: Like I said, ours will be a subset of that larger population. Just to refresh everyone=s memory of how often we=re going to be out at these sites doing the interviews and spot counts, 20 days a month, 14 weekdays, six weekends. We divided the access points into two separate zones, sampling zones so we can get out to each of those sites at different times throughout the day and we wouldn=t be sampling the same site at the same time every day and allow us to spend enough time to interview every now and then.

March and April are cool, a lot of rainy weather, some snowy weather, icy, wet conditions on the lake in the early parts of March in some of the locations. Really, you know, didn=t give too many opportunities for interviews. A lot of the use that we saw at that time was fishing. There was a lot of fishing going on upstream at Allisonia, walleye were running at that time.

I expect now that we=re going to start seeing an increase in use, schools getting out, temperatures are warmer, for the first time we=re seeing some jet skis and some water skiers out. I don=t know what the water temperature is previously but we=re starting to see some more active use going on, other than angling.

Just to talk about some of the other use here. The state

park is always providing lots of interviews, generally people are always there. Dublin is another place that we've been successful getting interviews through March and April.

Harry DeHaven on really nice -- it's weather driven, on a nice weekend day we'll see lots of people using the picnic areas and fishing in the area and off the shore there as well as launching boats. The Conrad Brothers is probably one of the lightest uses that we're seeing. I don't know if it's just a lack of parking or maybe they're clientele, I don't know, but it's getting light use there.

As we move forward maybe it's prudent to switch our effort away from these light use areas and use some of the areas where there's more use just to be sure to get interviews. Lowman's Ferry and Allisonia, Allisonia gets a lot of use, mixed use and then also the anglers putting in and maybe going up to the very upper end of the reservoir.

As of right now I don't have any proposals to shift our sampling schedules, or sampling weights or anything. I think we should continue on the path that we outlined in the study plan. I think that we're getting interviews at all the locations. We are out there enough days a month that we're capturing a broad spectrum of times and opportunities and weather patterns to get enough

interviews and spot counts.

Along the New River it's a shortly reduced effort compared to the lake study. Nine days a month is our effort sampling there. We've broken the river sections into three zones almost comparable to the zones that Tom Payne was talking about earlier today and it makes sense from a logistics standpoint of how many access points we can sample with travel time and spending enough time at each one.

Giving equal weight between the zones. Each zone will be sampled three times a month, a breakdown of six weekend days and three week days a month. Each day includes an eight hour sampling day where a starting location is chosen at random and the direction of travel is decided on the flip of a coin and within that eight hours we spend equal times at each site minus the travel time.

Then during the travel time we're also trying to capture how many people we spotted using the river, how far are the pullouts along the road, people who are putting in fishing, wading out into the water and administering interviews when there is opportunity to.

So we understand, I think everyone understood that there is a lot of disburse use going on. We are trying to capture that on the days that we're out there, making every effort to count those

people within the zone that we're in and also getting interviews.

Another tool that will be used will be the flyovers, which I'll talk about a little bit later, but three of our flyovers will include sampling or photographing the river from the dam to Glen Lyn. So this will help us get the entire river use in photograph and we will go back and count that, which will be a supplement to what we're seeing on the ground in just one zone.

BOB MUNSON: Jot, if you get low enough you can get all these grass specs these guys are looking for.

JOT SPLENDIA: If the water is clear enough maybe.

BILL KITTRELL: Are these black and white photos or colored?

JOT SPLENDIA: They'll be colored. They're not -- they're oblique so it's a pilot looking out the window at an angle or, you know, straight on, so it's not a direct shot down.

KEVIN YOUNG: But we were able to see some of that from the Smith Mountain area.

JOT SPLENDIA: Yeah. On the islands there you can see -- on a nice sunny day you can see the rock strata coming up underneath the water. You can see that. I don't know if you can see the vegetation as much but you can definitely get -- the pictures

are high quality. I think each picture is 17 meg so you can zoom in, extreme zoom in. You can get a lot of information on those pictures.

They are also very useful tools for the instantaneous spot counts on the days of the flyovers, photograph every parking lot area and count all the cars, the different mixes of the types of trailers, if they have car top gear, if they have boat trailers, might be able to tell jet ski trailers. You can usually tell what type of boats are going on, the elevations.

So using that information you can see how many people are estimated -- if you have a total count of boats on the water then you can also tell total count of launches from the access points. You get a mix of how much of the access area is applying relative to the shoreline homeowner. So the photographs are very useful on the information they get.

BILL KITTRELL: Fortunately the river is wide enough, you know, it's not like covered with tree canopy, but there is tree canopy on the one side I guess where you're, if you're shooting an oblique, at an oblique angle, you're seeing under one tree canopy pretty well, I guess the other shoreline is a little --

JOT SPLENDIA: It will be compromised.

BILL KITTRELL: Compromised.

JOT SPLENDIA: Yeah. And that=s, you know, there might be some strategy in looking at the maps seeing that there=s no frontage road to focus on one side of the river or not. I think that that is true in some areas. We=re trying to get into an angle where you want to look at pullouts, you know, that=s what we=re really looking at. Where are people getting in, wading under the canopy, stuff like that.

We have done a flight, it was April 21. I haven=t seen the photos yet but the pilot said it was very light use. I don=t know how to interpret his perception of light use versus what I=m trying to quantify so I don=t know -- I can=t give you hard numbers but he said it was hard to find somebody out there that day.

It was a weekend, it was Saturday, it was cool. I think it was in the low >60's. I would imagine there would have been anglers out. We=ve seen -- gotten interviews from a lot of anglers but what we=re not seeing -- you know, it=s a little too early for the water play type of stuff.

BOB MUNSON: Wait until school starts again next fall.

JOT SPLENDIA: The flyover schedule, we do have a midsummer one to take up the peak summertime use and then

there=s a post Labor Day flight scheduled as well.

BOB MUNSON: That would be the good one.

JOT SPLENDIA: Yeah. I think we=re going to have our work cut out for us in some of those locations around the -- inner tube rental companies and such.

JOHN COPELAND: You should have been there on May 8.

JOT SPLENDIA: May 8.

JOHN COPELAND: That was around McCoy. It was all Radford graduates.

JOT SPLENDIA: Now, taking our baseline estimates we=re going to make a concerted effort to try and project these out into the future. Not too many researchers go out on a far limb to actually make estimates out into the future but Ken Cordell whose part of the National Forest Research Center and part of the National Recreation Survey on the environment has a lot of data available to him that=s gone out, this is researchers and made projections, future recreation estimate projections out into the future.

It will look at all different types of demographic factors that contribute to why or where, people recreating, what age groups and they=ve come up with a model that says certain activities will

increase or decrease through time based on what the population and demographics are doing in different parts of the country.

We'll use his indices and also look at the low flow populations and demographics, mostly population growth compared to his model and see if his model over or under predicts population growth and see if that's a -- basically combine local numbers with his larger regional numbers and try to estimate activity uses forward.

Just need to be careful of how much we trust these numbers when we get too far out but it is an effort that we think is worth trying. Back to using the photographs and spatial representation characterization. We said we would do 13 days for the project area and three days from the dam to the New River.

The breakdown we discussed at one of the workgroup meetings post study plan determination was eight weekend days, four week days and then one agreed to Labor Day weekend being one of the, probably the peak day.

One risk that I see and we may be able to minimize this is that if we want to try and capture the holiday use we put all our eggs into the last holiday weekend. I don't know if a hurricane season might compromise that date and then we've got a holiday

weekend.

But because the Fourth of July is on a Wednesday this year I don't think that's a good option either since we don't know when people are going to take their holiday weekend and plan for that. If they're going to take the Saturday before or the Saturday after to that three day, four day weekend.

So I do still recommend the Labor Day weekend.

The strategy is once you get the photographs is to digitize the boats, put them into a GIS and that way you can do density analysis looking at how close and at what densities people are boating at at that moment in time. Taking them over a series of photographs we get to see if there is relationships where certain areas of the lake are popular with boating.

This information can be useful for future recreation and shoreline management planning looking at where it makes sense to have access to the water. We don't want to put a lot of folks into an area where there is already a high density of boats.

We're just collecting the baseline information now and we're collecting it in a way that's useful for other efforts. Here is an example. It doesn't show up -- unfortunately it doesn't show up well but you can see the docks, the boats themselves. Here is a

stretch of lake. Then from this high concentration there are density rings.

The metric here is so many acres of water per boat. So here there might be 15 acres of water per boat and then radiating out and then here you might have 150 acres of water per boat. Just as an example. Those aren't the exact ones.

The subset or I guess the angler use survey study is a subcomponent of the recreation study. It's an angler use study looking at catch effort and harvest. It's going to be on the surface of Claytor Lake and the downstream access point just below the dam.

It will be capturing angler effort and catch through interviews administered from our boat onto other anglers and since we're capturing how long they've been angling and what they've caught you get a catch per unit effort and then you can calculate how many hours, estimate all the anglers there and figure what success rates are, catch or harvest rates per unit of fishing effort.

Also with the survey we can figure out their preference, specie preferences and how much they're spending or other things like where they're coming from and why they made trips to Claytor Lake. There was also at the workgroup meeting discussion and DGIF supplied a supplemental questionnaire, questions related to the

straight bass fishermen, because that was the point of interest that they had and since we were going to be out there it made sense to administer extra questions at that time.

Basic methods, roving creel surveys from the water. This is the first time this has been done in Claytor Lake. It's two components. It's interviews with as many anglers as you can get in your area or your zone, plus an instantaneous count at some point to figure out how many people are fishing at that sampling time. So, it's a combination of interviews and counts together other processed through time will give you -- you can extrapolate that upward to the entire season.

We worked on two sampling zones that included also all the water anglers, all the bank anglers. Everyone is familiar with the two zones, basically Peak Creek and Harry DeHaven. Upstream is one zone and downstream to the dam is another zone.

Up until now the zone has been sampled 50/50. I would say that's because at the workgroup meeting I think it was left open.

DGIF told us if we need to change, we could have flexibility to do that. That's something we can do on a workgroup setting once we get more, collect more information and start processing the numbers.

Right now I think the upstream zone has been getting lots of interviews with the walleye fishing that's been going on. It's a difficult zone because of all the shoaling that's going on upstream at Lowman's Ferry Bridge.

Although it's slow to get around in that area there has been a lot of effort up there as well. I don't see a need to make a change now. I think that obviously DGIF will weigh in on that. It's just something we've left the door open for later.

On a monthly basis, that's five weekend days and five week days a month and also holidays will be sampled. One limitation that we've always talked about from the very beginning has been the night angling effort and I think that we're realizing now that the striper anglers are out at night and we might be missing that on the interviews.

They might be coming out in the daytime hours later on this season as they start trolling the deeper waters and if we get an interview then we'll get the question the interview asks, you know, did you fish the previous month and how many times.

So we're going to get some idea for quantification of the night fishing but I think everyone -- we recognize that as a limitation going into this study. The interview form is basically going to follow

similar interview forms we used produced by DGIF at other lakes we also tailored it to this specific interest on this lake. We did that through the workgroup back in February.

Some of the questions or things that we get at are species preference, demographics, expenditures, awareness of consumption advisories, and then there is also supplemental questions of the striped bass and hybrid striped bass, angling.

Like I said, we're just at data collection effort now. A lot of these interviews and spot counts are being collected, entered into a master database. The idea is we could quarry the database. At the completion of the survey we can figure out what is the visitor profile. We can figure out their preferences and their perceptions on how crowded it was at certain seasons, how much money they spent, how far they're coming from, to give basic baseline information on what are the users, what are their issues here when recreating in Claytor Lake.

Then the angler use will also give baseline information to help DGIF system at fisheries management programs for the lake as well, which is contributing to recreation as a whole.

As far as our schedule we started fieldwork March 1. We're going to be collecting interviews and spot counts through the

summer and up through November 30, capturing pretty much the entire spectrum of the bulk of the use on the lake and the river. We=ll have another update report in November. We should be near the completion of our fieldwork. We=ll have a much better sense of how well we did at that update meeting and then draft reports following that.

So as far as the updates I think generally we are in good shape. We hope to be getting lots of interviews both on the river and around the reservoir. Our traffic counters have been working fine. We=ve got two marinas that have been very cooperative in allowing us to get on their property and interviewing their users as well and do spot counts at the two marinas.

The state parks have been helpful in sharing information that they have and letting us get into their property on a regular basis and do spot counts there and whatever information they=re collecting will incorporate into our study as it is pertinent.

I was just talking before with DGIF and they were doing some creel surveys down below the dam on the river, we could probably coordinate sharing information that you guys get on those spot counts and boating information too.

BILL KITTRELL: Just to follow-up on that, we=re doing a

river wide creel survey, angler use survey so it=s above Claytor, below Claytor, so it=s peak season and will go through, what, October?

JOHN COPELAND: Through August.

BILL KITTRELL: Through August.

JOHN COPELAND: May through August.

BILL KITTRELL: That will be some supplemental information. We wanted to do an angler use survey at the same time that you were going to be doing the Claytor angler survey.

JOT SPLENDIA: There=s an opportunity there to share information from both interviews. Also we --

KEVIN YOUNG: Do you have the details on that study, Jot?

JOT SPLENDIA: We just talked about it this morning so. Another detail on the angler use regarding -- we=re in with contact DGIF about using their model that actually runs the information post processing. So once we get the surveys and into the database we can hand it over to the model that they use that=s standard with their other reservoirs, lakes.

RON POWERS: There are a couple of events that are going to happen on the lake that will draw out an abnormal amount of

boats. One of those is the Claytor Lake Festival and fireworks display where folks come from all over the lake down in front of the state park there. You may or may not be aware of it.

Then the other one is the Fourth of July boat parade that=s going to happen Sunday prior to the Fourth of July.

JOT SPLENDIA: Right. I think that=s good information for us to have. I think there=s some things we can quantify and there=s some things we=re going to have to qualitatively characterize. Things like we know that we can do spot counts and we can get maximum people at one time, we also know there=s festivals, there are events, a lot of bass fishing tournaments at night that are going on. We=re trying to characterize those events into the study report as a whole.

I don=t think we=ll get use numbers on a regular basis from those type of events. So in each of those times that we describe or characterize something we don=t have numbers for we can always talk about the limitations of how we would go about recording them.

BOB MUNSON: Jot, I didn=t see any place in there where we looked at the effects of reservoir operations or dam operations on recreational boating downstream.

JOT SPLENDIA: Right. In the survey that we worked out at the workgroup meeting we do have flow questions tied into that. We're asking the questions of everyone, did you come here based on the flow, did these flows modify how you recreated today, how would you rate the flow for boatability, safety, fishability, wadeability, things like that.

So there are questions worked in and then we'll get that information and the date and time and tie that into the flow at that time from the gage information. So that is captured in the user interviews.

BOB MUNSON: So we will be able to draw some conclusions at the end of this process about how release rates effect recreation?

JOT SPLENDIA: Right. The key there is getting them across the spectrum of different releases, different flows. So another part is coordinating with the manipulated flows or the flow manipulation that Tom Payne's group will be doing, trying to get our survey people out there to capture people on the same times to get to the high flows in, also trying to get the flows in March and early April, which I think was compromised from the cool weather.

We didn't get as high a number as we're going to get

in midsummer or fall when it will be integrated with students. So I think that we're making the effort to get out there and trying to get how much the flow is going to range and how many interviews we have is something we'll have to see later on.

JOHN SMITH: You might want to put a footnote by that April 21 date because this was five days after the shooting.

JOT SPLENDIA: Right.

JOHN SMITH: A lot of people aren't going to be in the mood for going out on the river.

JOT SPLENDIA: I don't think that would be a good day for the University. I had some discussions and I'm definitely going to footnote that, but maybe it would send people out to recreate to get their mind off it.

BILL KITTRELL: A lot of the student body went home.

JOT SPLENDIA: Yeah, a lot of students went home. But at the same time the water, I mean, it's too cold for wet recreation but you can still expect anglers. So it's worth keeping in the report because that's a significant event in the area. What role it played in recreation at that time.

JOHN COPELAND: Do you have any idea how many angler interviews you've had on the lake so far?

JOT SPLENDIA: On the lake, I would -- I've entered probably about 50 into our database and I know there's probably another 25, 50 on that waiting to mail up, so I think a safe bet is close to 100 between March 1 and now.

You know, the feeling I get is that people have generally been friendly. A lot of repeat people sees the same person out there, oh, yeah, you got my brother last week or you got my son yesterday, oh, I gave you an interview last month, you know. The same people going out.

Before it was all anglers now we're starting to see some pontoon boats and mix where maybe the husband is fishing and the wife is reading or you get people on jet skis, a couple of jet skiers. We're starting to see more use now but before the boat traffic was generally anglers.

BILL KITTRELL: Has he been challenged by people who are trolling?

JOT SPLENDIA: That is a challenge.

BILL KITTRELL: Getting in close and getting --

JOT SPLENDIA: Well, the nature of the trolling until now has been nighttime, so it hasn't been for the majority of the time and I asked him before, you know, can you get to them, if they're friendly

enough yes but it is something that I pressured him to try and make an effort to do.

A big part of it up until this point has been just the lack of overlap, you know. Striped bass fishing has been nighttime oriented where the survey ends at a half hour before sunset. So if the trolling starts to turn into daytime then we will have overlap and I'll pressure him into trying to get those interviews.

That type of use is definitely going to be a different long period to get interviews from than say someone who is using the trolling motor along the shoreline.

TERESA ROGERS: Anything else? Let's go on to Navigation.

Navigation

TERESA ROGERS: I'm going to give the navigational systems study update. Our review of the objectives for this study, the first was to inventory the existing shoal to rock markers and develop GIS mapping. Develop a set of guidelines for determining the conditions under which additional navigational markers should be approved. Determine the need and location for additional navigation markers using information from bathymetry survey, knowledge of the reservoir and guidelines that have been developed.

Identify processes to address safety related issues on Claytor Lake, including the process for the approval, installation and maintenance of navigation markers and then verify and update information related to the heights of line crossing Claytor Lake and evaluate the need for modifications.

Activities to date, they are out on the lake right now. Philip from our Rocky Mount office that does GIS is doing the survey of all of the existing markers out on the lake and they are taking information about visual conditions at each site and they're taking a GIS status so that we can actually map where all of the existing markers are.

What we're going to be doing next is we're going to be locating all that information on the bathymetric maps and they'll be ready the end of May and then we'll get together as a part of the workgroup and start evaluating this.

This is an example, it's kind of hard to see on here, of what the mapping will look like. You'll be able to see all of the underwater contours and then you'll be able to see if there are shoal markers out there, where they're located and at what level.

So this will kind of give us some baseline information to evaluate what levels should you be marking for shoals and does that

need to be modified and do we need to add more.

I have started gathering all the existing standards from the different agencies, the Coast Guard. So far I=ve obtained information from Pulaski Zoning Ordinances. I=ve got Game and Inland Fisheries Rules for Establishment Uniform Regulatory Markers on Public Waterways.

I have the US Coast Guard Private Aides to Navigation and then I=ve got a copy of the agreement between the US Coast Guard and the State of Virginia that allows the state to regulate these kinds of markers. For Claytor the state has to approve any marker that goes out there. You just can=t put a marker out there yourself, you have to go through the approval process and that does include the county as well.

The next steps, we=ll be getting together with the workgroup. I had originally planned to do this earlier than this, in March and then things kind of got changed with Smith Mountain so I=m a little bit behind schedule on this part of it from my original plan. But the guidelines we=ll need to look at and determine what conditions under which additional markers should be approved.

We will look at all the existing guidelines that are out there because we want to make sure that we=re in compliance with

any state or federal requirement. Then we=ll start looking at project operations and the changing in elevations and take that into account when we come up with these guidelines.

We will be consulting with the Coast Guard Auxiliary, Game and Inland Fisheries, DCR and Friends of Claytor Lake. We will also get in touch with the fishing clubs and marina owners and get their input as well. We=ll start identifying the processes for other safety related issues that we identify. We=ve already started some of the identifications such as how to deal with things like drums, safety related issues like underwater hazards, that type of thing. We will be doing a survey during the draw down to identify any kind of submerged navigational hazards.

If you remember Brady Todd gave his presentation. A lot of that will be on the mapping itself, so we=ll be using that bathymetric map to determine some of that information. Then we=re also going to be updating and reviewing our line crossings. Those line crossings are also going to show up on the end product of the aerial mapping and bathymetry as well.

As far as the schedule, they are out there right now doing field survey of any existing markers and we=re finalizing the base map in their handheld units so that we can get some

preliminary information together.

I=ll be having a workgroup meeting as soon as we have something to meet about. It=s kind of early. I don=t want to meet everybody to death so I want to make sure that we have enough information to start making some recommendations when we do meet.

Field surveys will also be conducted in November and I=ll also be getting a study update in November as well.

Any questions? This is pretty straightforward. That took all of one minute. I do have some people that are coming specifically for the shoreline workgroups so I don=t want to start this one early, so we have a little bit of, a half hour break and then we=ll get back together and I=ll go through the shoreline.

Shoreline Management Workgroup Update

TERESA ROGERS: Shoreline management workgroup. I don=t know if you all remember all the history of this or not but during the scoping for relicensing it was identified by several of the stakeholders that there needed to be a shoreline management plan for Claytor.

The shoreline management plan really isn=t a study in and of itself. What we=ve committed to do is to get a workgroup

together to obtain information from all the studies and start developing a plan for Claytor.

What the workgroup will be doing is we'll start with evaluating the existing guidelines. We do have shoreline guidelines that were developed, I think it was back in like 2002, with a group of stakeholders from Claytor Lake and I would then put them in state agencies for things like docks, that's both private and commercial, shoreline stabilization, dredging, shoreline excavation and that type of thing.

So we do have some guidelines that we use. For example, there is a new marina that's being sited at Claytor and in order for us to grant approval for it it has to go through the process, review process by the FERC. So what we did was we used the guidelines that had been developed to evaluate how this project matches those guidelines and then that will be submitted to the FERC -- well to the agencies first for review and then it goes to the FERC for their final approval.

For shoreline management what we'll need to do is identify the various resources that need to be protected along the shoreline. These will include things and this is not an exhaustive list by any means but things like cultural resources, wetlands, aesthetic

areas, they'll need to be identified and measures developed to protect those types of things, riparian areas, habitat like littoral and any other habitat that's identified during any of the studies that are going on now.

So what we'll do is we'll utilize all this information and the mapping obtained from all the studies that are going on right now and then we'll decide, we'll determine where those resources are and then we'll identify measures to protect those resources.

We'll also revise the guidelines that are in place now because we've been using these guidelines since 2002, so we'll reevaluate those, see if they're working, see if they need to be modified, see if there's new guidelines that need to be developed.

Those are things that will be determined through this workgroup. To date right now, of course what we've been listening to the last two days, we do have these studies that are going on at this time. They are out in the field collecting the information, what we put the maps together with.

Then the next step and this is a really important step, is we do need to identify all the stakeholders that will be involved because there's a lot of people that we need to bring into this group that are not necessarily part of any of the workgroups that are going

on now and they may not even know they are interested in relicensing at this point because they really haven't been keeping up.

We'll need to make an effort to go out and involve the marina owners and the business community especially, people like the dock builders, the contractors that are involved with shoreline stabilization. We need to make sure that they are involved in reviewing the existing guidelines and whatever we come up with in the end.

Of course we'll have the state agencies involved, federal agencies, Pulaski County, Friends of Claytor Lake, any other property associations that are out there that may be interested, Chamber of Commerce if they are interested.

It's very important to identify these people up front and get their input and their buy in up front because this will set guidelines on how the lake is developed in the future so it's very important that they are aware up front what's being determined.

I know we're going to be starting a process of meetings to evaluate the existing guidelines and identify the resources. Right now I'm looking at probably beginning, end of fall. I think we'll start having some information we can start looking at by then as far as

some of the study results.

We can start with the aesthetic areas. I know there is a question in the questionnaires about aesthetics so that will some information that the workgroup can use when they're developing what parameters make a certain area aesthetic, that type of thing.

That's about it. I figured there would be more questions on this. This is a process that's going to be going on probably even after we submit the application for relicensing. I don't think we'll actually have a plan to present to the FERC. What I'm usually used to is FERC will come back and say our recommendation is to develop a shoreline management plan.

JOHN SMITH: We would prefer to have a plan.

TERESA ROGERS: Really.

JOHN SMITH: Well, that's the official word. I mean, officially we would really like to have a lot of these plans worked out so that the

TERESA ROGERS: The details.

JOHN SMITH: So that the license that's issued can tell these folks what to do, that would be the preference as opposed to what has been done in the past.

TERESA ROGERS: Okay. So we could actually submit

a plan?

JOHN SMITH: Yeah, you can. I think that's what our folks are saying is preferred. I mean that really applies with all the plans. I mean any type of plan. If it's at all possible to finalize it or state what the measures are to be done. I think we would prefer to have that worked out when the application comes in.

TERESA ROGERS: That might be possible in fact because we've gotten a portion of it done anyway through past, you know, efforts with the community, with Friends of Claytor Lake and everything. So I'm hoping we just tweak that portion and then we concentrate more on the resource end of it because we don't have that part right now in place. I'm trying to think of a time line.

We'll probably get the study results -- the final reports will be coming out early 2008 from like the wetland surveys, habitat surveys. I just want to make sure it's together.

JOHN SMITH: Well, the final draft application comes in is it the following year, 2009?

JOT SPLENDIA: That's the one thing I didn't bring.

BILL KITTRELL: Notice of intent is --

TERESA ROGERS: That's in November.

BILL KITTRELL: November of '08.

TERESA ROGERS: So it would be like --

JOT SPLENDIA: 2009.

LAURA BULLARD: January --

TERESA ROGERS: So we would have about a year, about a year to work on it.

JOHN SMITH: We would prefer to approve the plan rather than have to have you develop it after the fact.

TERESA ROGERS: Well, that=s what I will shoot for. This is a little bit different too that there is a lot of separate public input on this as well. We need to make sure we capture that. We did a lot of that in the initial guidelines. We had several public meetings where we shared what was being developed.

BILL KITTRELL: A comment and a question. It would be useful to maybe compile a few examples of the shoreline management plans from other areas where they=re, you know -- a Corps of Engineers facility or another utility.

TVA went through this long drawn out process of developing shoreline management plan on their reservoir system river wide, but, you know, there are some things that we could look at so we aren=t reinventing the wheel would help out.

Also, do you intend to just have informal meetings or are

you actually going to have formal public meetings to get input on a shoreline management plan?

TERESA ROGERS: What we've always done in the past is have formal public meetings. This is a little different because it's also relicensing where we have formal public meetings involved.

So I need to think about that a little bit. But just from past experience it's important that we involve the entire community to make sure they're aware of that, what's going on. When you're talking about people's lots and yards you have to be very --

BILL KITTRELL: That's why I'm saying, if it's a, you know, advertised formal public meeting then if they don't show up and don't provide input then at least you're covered. You know, you've invited everyone formally and it's not a separate committee that's sitting over here deciding what's going to happen with a bunch of landowners.

TERESA ROGERS: Exactly. It's very important with this especially.

RON POWERS: You know, the existing shoreline management plan approved by Pulaski county and the AEP and the stakeholder group initiated it is on the book.

TERESA ROGERS: Yes.

RON POWERS: To invite more people in to scrutinize that document could be a long and drawn out process. I'm hoping that we're not going to spend time reevaluating that to the extent that we say to whoever we invite to the meeting that it's all up for grabs again and we get to alter it.

That's my mind but to my mind that is a sound document, it's the one that has been in place now for five years. It leaves room for stakeholders to come in and add comment to the future of Claytor Lake in the aesthetics, change capacity of the lake, and also take into consideration I think maybe even conservation agents that would impact that.

BILL KITTRELL: Now are these the guidelines or is this a Pulaski County document?

TERESA ROGERS: Well, the way that it worked is that we came up with these guidelines and then Pulaski County adopted them as their own so that anything -- they're both the same so they're more consistent. I guess in my mind I wanted to see, you know, what's not working.

How do we determine that something doesn't work well, it needs to be tweaked somewhat. But I definitely did not envision going back to square one and reinventing the wheel because they

have been working very well.

WAYNE ALEXANDER: The Pulaski County Zoning Ordinance primarily addresses structures such as boat docks and things like that. It does not include shoreline stabilization criteria.

TERESA ROGERS: Yeah, we have to do that ourselves.

RON POWERS: But you do it by those management practices that were described then --

TERESA ROGERS: Right.

RON POWERS: In that document.

TERESA ROGERS: I think through this relicensing process we'll be bringing in a lot of really good information on what's working and what's not working, especially like erosion control, that type of thing. We need to --

BILL KITTRELL: Well, the mapping is going to be very important to the shoreline management plan because I know being somewhat involved with the TVA process, you know, they use that extensively when they're trying to decide about conservation easements, about setting aside areas for future recreational use or whatever, you know, current land use patterns and land use maps.

TERESA ROGERS: Mapping is definitely key to implementing this plan because you'll get an application in to you

and you have to see where is this activity occurring, you pull your resource maps and determine if that=s a good use for that area based on those maps. The mapping is the very key to implementation of the plan.

LAURA BULLARD: I wasn=t involved in the initial group that devised the guidelines but I understand that you do have guidelines for shoreline stabilization for instance and I=ve been thinking all along that the results of the study, the erosion and sedimentation study and all these studies that apply to shoreline stabilization would be used to update these guidelines; is that correct?

TERESA ROGERS: Correct. That will be used, yes.

DEBBIE LINEWEAVER: It seems like we could logically do both. You=re saying you didn=t visualize starting from ground zero.

TERESA ROGERS: Right.

DEBBIE LINEWEAVER: If we are a workgroup then we take just like in the studies, we take the current guidelines and other things and analyze and come up with perhaps a new plan or a new idea and then we have public meetings and say here=s what we=ve done what do you think.

TERESA ROGERS: That=s how that would be --

DEBBIE LINEWEAVER: And tweak it. And so we could do both. We need to work on it as a relatively small group and then make it public input.

TERESA ROGERS: That would be how we would do it. That=s why it=s so key in making sure we have all the parties at the table to begin with, or at least a representative so that they can give their input and their perspectives so that we=re not missing a key group. But yes and then we have a bigger public type forum to share that information and get comments back and that type of thing.

LAURA BULLARD: Where are the guidelines, current guidelines available and how does one get them?

TERESA ROGERS: The single family docks are on the county=s website. They direct anybody to us that=s involved with a commercial facility or multifamily facility and we give them -- what I=ll do is I=ll assemble all those guidelines into one document and provide it to each workgroup so they have everything, that includes not just ours but the county=s, Corps of Engineers, any group that has requirements for any type of shoreline construction, we need them all to be considered.

We went through a lot to put together those first -- I

mean years. It wasn't -- how many years did we meet, Ron.

RON POWERS: I think it was right after the earth cooled.

TERESA ROGERS: Yes. We worked every month. I know it was at least two years developing that first set of guidelines. So, it was not -- it definitely something that was not just thrown together. I definitely don't want to have to reinvent that. But we can look to see if there's anything that needs to be tweaked, because anytime you come up with a plan and you start implementing you think of ideas on this would work better or we didn't even consider this.

We're going to have boating density information from the study that we didn't have when we came up with the initial criteria. So we'll have a lot more information to feed into a shoreline management plan.

DEBBIE LINEWEAVER: If you're thinking if we start meeting in the fall and these studies are going on, some of them have a reporting time in November; is that right?

TERESA ROGERS: Right.

DEBBIE LINEWEAVER: I mean, we need some, whatever results might be available that pertain to this, we need to

have those studies before we get together as a workgroup. I mean we can't -- I don't know that we could do a very good job if we got something and said okay, let's look up and see what such and such a group came up with.

We need to process it. I feel like I would need to process a little bit before we came into the workgroup and started trying to go through that much material.

TERESA ROGERS: Yeah, I'll always try to give you things ahead of time so you're not caught cold to make decisions based on this today type thing.

DEBBIE LINEWEAVER: They won't have -- most of those studies won't have much for us until --

TERESA ROGERS: We can start with the existing guidelines. There are some things we can start doing ahead of time. The main thing is identifying up front in our heads what are the things that we want to protect based on just our knowledge of the resources.

Then the studies will bring in where those resources are located. So we don't actually have to know where they're located before we start identifying them. If that makes sense. But it's not a short process, it's not an easy process, I'll let you know up front.

LAURA BULLARD: It=s worth it though.

TERESA ROGERS: Typically too anytime you have shoreline guidelines in a plan we probably put in the plan to have it reevaluated ever so many years, that=s just typical. So it=s never something you just do once, you know. You do it and update it every so many years because things change on the lake and we have to give that consideration.

That=s the plan for shoreline management. Any other questions? I=ll be in contact with different people. And it may take a little while to identify everybody too. That=s very key to make sure that we invite people to the table, especially if their livelihood could be impacted. It=s just very important that we hear from them.

We will be hearing from them so we may as well have them at the table when we=re developing everything. That=s all I have. Thank you so much for being here the last two days and going through all these studies. I think it is very important that we keep updated on where we stand on everything. Thank you very much.
