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SAV Partners' Summer Meeting Notes
September 4, 2012

DENR Washington Regional Office, Hwy. 17
Washington, North Carolina

Present: Dean Carpenter (APNEP), Anne Deaton (NCDMF), John Fear (NCDCM), Don Field (NOAA-NOS), John Gallegos (USFWS-Back Bay NWR), Kevin Hart (NCDMF-Habitat), Jimmy Johnson (NCDENR and APNEP), Jud Kenworthy (NOAA-NOS), Wilson Laney (USFWS-South Atlantic FWCO), and Joe Luczkovich (ECU, Biology Department).

Anne had called Kevin to let us know that she was running 15-20 minutes late for the meeting. Dean indicated that he would begin the meeting at 12:45, rather than 12:30, so that hopefully Anne would be present from the beginning.

Welcome

Dean Carpenter convened the meeting at 12:45 pm. He began with a recap of where the Partnership stands. He had facilitated the group from 2004 - 2008. The original plan was for different partnership organizations to facilitate each year. Brian Conrad (NCDMF) had run the meetings from 2009 - 2010, and then Anne Deaton (also NCDMF) beginning in 2011.

Now, we are trying a different model, with an Executive Committee consisting of Anne representing NCDMF, Wilson representing USFWS, Dean representing APNEP, and Brian Boutin from TNC. Brian has taken a new job with the South Florida Water Management District. So for the time being, Anne, Wilson and Dean will function as the Executive Committee.

Dean noted that he would run the meeting today, because the topic is largely about monitoring. The three Executive Committee members will meet later to discuss where to go from here.

Dean asked if anyone had any additions to the agenda.

John Gallegos stated that he felt the new organization was a great step forward, a big improvement. He liked the concept of having three agencies co-lead the group. Also, having a future workshop would provide an opportunity to highlight the SAV Action Plan. He likes the approach.

Dean noted that while today's attendance is low, many key people are present. He was glad the Partnership was still going after eight or nine years. John Gallegos noted it has been around longer than that amount of time.

Minutes

Dean noted that Anne had sent the minutes out with her last memorandum.

John Gallegos noted that there is one correction which needs to be made. The minutes should read "It the Committee's response to" instead of "addresses," on the last page of the minutes. John Gallegos moved approval of the minutes, and his motion was seconded and approved without further comment, with the noted change.

SAV Action Plan 2012

Activity tracking and plan review – Dean Carpenter

Dean noted that the Action Plan is supposed to be a short-term plan, and he presumes that the Executive Committee will be responsible for tracking actions, and raising any issues at the upcoming meeting, i.e., regarding any proposed change in priorities. He asked for questions, and there were none.

Update Committee Activities/Action

Monitoring and Assessment - Dean Carpenter

Dean gave us an update on SAV monitoring and assessment. He reviewed the 2007-2008 acquisition and groundtruthing. He noted that he felt it would be good to have a review, and then discuss the Monitoring Protocols project, 2009-2012 (CRFL funded); image acquisition; and groundtruth planning.

He noted that he would appreciate assistance from Don and Jud as he moved through these topics.

- **SAV monitoring protocols project (CRFL funded) update**

Dean noted that many partners were engaged during the 2007 monitoring. Resources came largely from APNEP, USFWS and NCDMF. APNEP used a NOAA indefinite delivery, indefinite quantity (IDIQ) contract mechanism. The flights were contracted to Dewberry, with Aerometric from Wisconsin actually doing the flights. Bill and Dean discovered soon thereafter that Aerometric actually didn't have any experience doing aquatic resource monitoring.

Don Field noted that was disappointing, because the IDIQ is supposed to confer the ability to get someone who is experience, and NOAA didn't. Jud noted, however, since APNEP's contract Aerometric has become very experienced, to the extent that they shot all the aerial footage of the Gulf Oil Discharge. They shot some of the best aerial footage which Jud has ever seen. The work they did for APNEP was sort of a trial run for them, and obviously paid off. Jud indicated that they have done multiple missions now (three) and also flew a pre-Isaac mission.

Dean noted that we also should talk about water clarity. The flights were at 20-22,000 feet and when pilots fly that high they cannot see whitecaps, so they have to depend on ground observations. Many water clarity volunteers were on the ground. Scott Chappell organized that effort. Scott has since moved from NCDMF to Norfolk, Virginia, where he is working with the private sector.

Dean noted that the final component was the Ground Truth Network, which was coordinated by Brian Conrad (NCDMF). John Gallegos noted that Anne had provided some excellent training for the groundtruthing crew. Dean asked Anne how many of those trained actually participated. Anne noted that the survey area was divided into 67 crew areas. NCDMF staff surveyed 55 of the 67 areas. Even NCDMF biologists were trained. ECU, NCDWQ, NCDOT, NCWRC, USFWS and also other NCDMF staff from Morehead all participated.

Dean reviewed the aerial monitoring phases. The pixel resolution was one meter, in four bands, three visible (blue, green, red) and near infrared. A photo of the camera used to acquire the imagery was displayed. Many factors must be considered for successful acquisition: low winds, sun angle, low tide, low turbidity, no clouds or haze, and adequate biomass of target.

John Gallegos noted that the folks on the ground collected the data early morning on possible fly days, and this data was relayed to the Aerometric pilots.

Anne noted that of the 75 volunteers trained, only about 25 of them actually participated. Dean noted that we will have to have a similar monitoring protocol this time. Anne noted that in 2007 there were three volunteer crews in the Back Bay area. The USFWS did one site, and volunteers from Elizabeth City State University did several others.

Dean reviewed the autumn 2007 and spring 2008 data acquisition. There was additional imagery which was acquired in May 2006 by NOAA, which was at significantly higher resolution. The resultant map is really a two-year composite. The 2006 imagery was flown at the 10,000-foot level, instead of 22,000.

Kevin Hart asked, given the change in elevation, will we still be able to detect a trend, using the old imagery?

Don indicated that he didn't feel there was a significant enough difference to cause any problems. Problems arise if the turbidity is too high in the deeper waters.

Anne stated that is the area, i.e., the deeper water edges, where we want to detect the changes, so she felt that it would be an issue.

Don stated that he didn't believe it would make that much of a difference.

Kevin asked if that was true for the freshwater areas. Don indicated that all the bets were off for the freshwater areas, with the understanding that the northern areas, Currituck Sound and Back Bay, are low in salinity.

Don stated that there are some SAV beds whose edges migrate. There are some issues, when you are considering change. Detecting any change that is the width of this meeting room is difficult. This discussion should consider what represents change. Even flights as low as 10,000 feet (approximate height of upcoming flights) is still pretty high altitude. Don wasn't advocating that the entire state be re-flown to develop a new baseline at the newer resolution.

Anne asked why we didn't fly at 10,000 feet last time. Don indicated that it costs a lot more to fly lower.

Dean showed us the 2007, 1 m imagery for Drum Inlet and also another aerial from Core Sound, north of Atlantic. Dean noted that by using the IR band analysts are able to collect information on the vegetation and define the boundaries between the water and the land. Jud asked if anyone had used the imagery since it was acquired. Dean indicated, not to his knowledge. Anne asked if we had the shoreline imagery, all the way inland. Don wasn't sure how far, but he felt that it went fairly far inland. It does cover a good bit of the salt marsh. Although he wished he could put a number on it, he cannot.

Dean posted the information collected by the groundtruth volunteers. There were 1,056 random points visited (82% of them by NCDMF). Points selected from areas where SAV was previously mapped, or areas not previously mapped, down to a depth of 2 m. The points were visited with small boats, SAV was visualized from boats when possible, wading when possible, and rakes when the water was too deep and/or too turbid.

Jud asked if more points are required this time. Dean indicated that we need to discuss that need.

Dean noted that since the 2007-2008 survey, the Coastal Recreation Fishing License (CRFL) program had funded an APNEP-managed study, which is being conducted by multiple partners (Jud Kenworthy, Cecilia Krahforst, Joe Luczkovich, Christine Buckel, Don Field, and others) regarding an approach to SAV monitoring in North Carolina, including the role of boat-based technologies, i.e., SONAR and underwater video. Dean asked Joe to provide a synopsis.

Joe noted that his ECU team is using the Biosonics SONAR method. He explained how the method works. The SONAR pings downward and generates acoustic reports which document where SAV is present. The bottom line is that a report is produced every three meters (ten pings per meter). SAV returns a different kind of echo to the SONAR, which enables the mapping. Plants produce a softer echo, because of the air inside their leaves. The instrument operator on the boat, receives an echogram, which shows SAV locations. The imagery from the recorder also enables you to measure plant height. There are companies other than Biosonics that sell SONAR technology. The reports are also geo-referenced and these can be used with a GIS.

Dean asked Joe to address the algorithm which deals with plant height threshold. Joe noted that the default setting in the equipment uses 7 cm as a minimum plant height for SAV. Anything on the bottom which exceeds that threshold height will be labeled SAV. Thus it would detect cypress knees and other objects.

Dean noted that it does penetrate turbidity and other occlusions. Joe concurred and noted that you can process a lot of data in a short order, in less time than that for the video analysis.

Dean asked who between Jud and Don wants to discuss the video method. Jud volunteered and noted that two of the CRFL objectives entailed evaluating difference techniques for evaluating SAV. Jud noted that there have been several applications of this technology. Staff in Puget Sound, Washington, do their entire monitoring program using video. The CRFL-project team hopes at the end of the study that they could recommend a method for a state-wide survey. The team had set a pretty high standard, at trying to detect 10% change. North Carolina estuarine systems in North Carolina are complex, both physically and biologically. The team is in the process of writing a final report. Neither of the two techniques alone could be used for a statewide monitoring program, but they may be able to recommend reliably the two approaches. They have combined the two approaches in the draft report.

Jud noted that they were able to harvest data collected during the study to do some comparisons. Several things had happened. They could see from the newly acquired aerial data, what was visible and what wasn't. They decided that the study areas have to be stabilized. Jud noted that there are high-salinity, and low salinity systems. They are going to recommend further stratification in the river systems. It is unrealistic to believe that all SAV in North Carolina could be monitored each year. With Don's help, they have been able to identify those portions of the state which can never be reliability censused.

Anne asked Jud if he was referring to aerial photography when he referenced remote sensing. Jud was referring to both aerial and boat-based technologies. In their final report they propose to combine all of the methodologies. They are working to fine-tune a potentially merged approach, which will include estimates from various methods. False positives are one issue when you use the SONAR. Using the video mode is a lot faster. Jud noted that they won't be recommending that the state run off and use this method, right away. They plan to do an actual field test of the actual accuracy.

Joe noted that there is a new paper out which attempts to address the false positives problem. He talked to Ray Valley at the American Fisheries Society meeting. The SONAR unit which is currently being used compares adjacent pings, and so provides better resolution. The pings are better able to distinguish between soft bottoms and plants. So, SONAR technologies are continuing to improve.

Jud reiterated that the research team had set an extraordinarily high bar. The State of Washington is the only jurisdiction which has set a high standard. No other state has such a performance measure. Given the size and complexities of North Carolina, it appears that SAV monitoring cannot initially achieve a performance-based approach. What they recommend is to establish sentinel sites in the various strata. They would like to form a group to establish priorities for the future surveys. At the same time, they would work on a completely probabilistic sample size. The target area is large, and we don't know where much of the SAV occurs in freshwater. Another thing that they have done is to use the SONAR and video together. They will recommend a protocol for further mapping. The next step will be developing probabilistic sampling. If one has no idea as to the location of the target population, it is all the more difficult.

Don noted that a lot of the CRFL grant must be expended on securing the aerial images.

Jud explained how the equipment works. They are leaning more toward using a drop camera instead of a transect approach, to do the groundtruthing.

Dean thanked both Don and Jud for their input. He he would like to see some formal discussion of their report, at the next meeting.

Dean explained how the images are interpreted, once acquired. He noted that this took a long time: image acquisition was completed in mid-2008, but the map wasn't published until late 2011. John Gallegos noted a lot of the delay was due to funding issues.

Dean asked, where do we go from here? He noted that we do have a map, but it is already five years old. Partners (NOAA, ECU, NCSU and APNEP) obtained a CRFL grant to try to develop a statewide monitoring program. The proposal is to do the low salinity areas during this fall. The aerial surveys will be done only in the coastal region.

- **SAV image acquisition, 2012-2013**

Dean showed us the maps, and noted that 71% of the visible SAV occurs from Oregon Inlet to Cape Lookout. Dean reviewed the proposal, based on his and Don's discussions with NCDOT. The proposal entails use of a digital mapping camera, flying at 10,000 feet above mean terrain, 0.3 m resolution, using four bands, with acquisition by the NCDOT crew. These are SAV protocols for Subregion 1 (North), which includes Roanoke, Croatan, Eastern Albemarle, Currituck Sounds and Back Bay.

For the spring, all would be the same, except they would shift south to Subregions 2 (Central) and 3 (South).

Dean showed us the subregion maps, courtesy of NCDOT. While NCDOT does not have the Virginia imagery, the area does cover Back Bay. Dean noted that he and Don had just created polygons that encompassed the visible SAV. He showed us the North Region first, which is proposed for flying between mid-September and mid-October.

Don noted that Brian Boutin had done a lot of work in the area, and indicated that he had never seen any *Halodule* (shoal grass) or *Zostera* (eel grass) north of the US 64 Bridge. Brian had indicated to Don that some of the areas mapped as SAV were likely marsh detritus instead.

Jud asked whether Joe had surveyed that area. Joe indicated that his ECU team had done so, in the area of the proposed mid-Bay bridge. They found SAV, including *Valisneria*, but no *Zostera* or *Halodule*. Copies of the report are available.

Jud asked if Dean had an overlay of the points used for verification in the previous monitoring. Dean indicated that Brian Conrad had recommended doing another randomization. Jud asked how many were used in 2007-2008, and whether he was planning on using the same number. Dean noted that last time we had an insufficient number because all were used for interpretation. He indicated that he could say how many stations were done, based on the research Anne had done.

Dean noted that there are other regions, Central and South (including Bogue), and he showed us the maps for those regions.

Anne noted that the CRFL report will look at the entire coast, and not just the APNEP portion. Dean indicated that was the case.

Jud noted that they really don't have a handle on the Bogue Region, with regard to the interpretation. There was no formal report written for the whole project. They will not say what to do in this region. They have not made any recommendation regarding whether or not this should be done aerially. Anne felt that it could be done aerially. Jud asked if she meant the 0.3 m resolution. She indicated that she meant the 1-m resolution. Anne noted that she felt that there was no SAV in the Cape Fear area.

Jud noted that where Don can do the analysis of the rest of the area, he has no idea regarding the reliability for any data collected south of Bogue Sound area. Joe read the comment from the report. Jud noted that Anne clearly has an opinion on this, so we may wish to fold this into the report.

Jud noted that he personally doesn't know what the quality of the interpretation is for that area. Someone looked at all the images, but they didn't necessarily tell us what they found, based on all the points that we gave them. Don noted that some of the points were Gracillaria, but others may have been small, fringing points.

Anne noted that there is some transition there. She noted that from New Hanover, through New River, she felt that it was pretty accurate, except that it was under-represented in New River. There is more there than was mapped.

John Gallegos asked Don whether the contractor should have provided some estimate of reliability.

Don noted that usually data from some points are reserved for QA/QC. But for the 2007-2008 effort such reserves were not possible, because the job was handed to a contractor with no experience. Don noted that in remote sensing everyone believes that the accuracy is high, but that is not the case. Even Chesapeake Bay does not have any sense of what the reliability really is.

Jud asked if that southern region should be photographed at the higher resolution, in view of the issues.

Dean said that the estimate for the entire area, at a 0.3-m resolution, is $83,000, which is much less than the 2007-2008 survey. He anticipates covering 80% of the SAV. If between now and May-June additional funds are secured, it shouldn't cost that much extra to fly the area south of Bogue. Anne noted that it should be part of the plan, even though APNEP can't fund that portion. She suggested that NCDOT still should be willing to do the flying. Dean was sure that they would be willing to do the work.

Jud noted that other state agencies should be interested in the shoreline. He noted that when that area is flown, you would get the shoreline. Dean noted that NCDOT does most of their overflights during the winter (leaf-off), so they are more available for SAV flights in the May to October period.

Wilson noted that there may be some amounts of SAV, in that very southern-most part of the state. He noted that the South Carolina and Georgia members of the ASMFC Habitat Committee have always insisted that they have no SAV there, but he knows that this is not totally true, because NMFS colleague Prescott Brownell has shown him *Ruppia* growing adjacent to his personal dock, which is on the south side of Charleston Harbor, off the AIWW. Wilson noted also that he and Roger Rulifson had found some SAV in the vicinity of Southport, when they were in graduate school. He suggested that any final report should contain a statement to the effect that there may be some SAV in that area, but we feel it isn't enough to warrant any overflights. Anne noted that NCDMF monitoring should detect any SAV there, as a consequence of their ongoing boat-based sampling activity.

All confirmed that the price being quoted by NCDOT was very reasonable. Wilson noted that it was good to have a cost going way down, instead of way up.

- **SAV groundtruth planning, Fall 2012**

Dean noted the 2007-2008 groundtruth effort, and asked for discussion about how many stations should be used this time. He asked if we should do additional areas and stations. He also asked about sentinel stations. In 2007 there were four areas, 7-15 stations per area, one crew per day-area.

Don asked Dean to re-project the map of the 2007 field verification points. Dean did so. John Gallegos noted that we should talk to the Mackay Island National Wildlife Refuge staff. Wilson noted that he and Dean had mentioned to Rebecca Bartel and Dennis Stewart (USFWS) about our monitoring needs, and Wilson hoped that they might be willing to participate. He might have further opportunity to talk to them again later this week. Rebecca is part of the NWR Inventory and Monitoring Program, within the South Atlantic LCC geography.

John and Anne briefly discussed the monitoring protocol. Anne noted that the NCDMF data clerk had entered the data. She noted that the exercise has to begin with the generation of the random points. John Gallegos noted that they still have GIS maps of the points they sampled in 2007.

Anne indicted that 1,494 points were pre-selected. Of those, 1,250 were sampled. Sometimes the points turned out to be on land or in marshes. Anne noted that 308 of the 1,494 had SAV present. Joe asked why there were some black, unsampled gaps in the distribution of points? Dean thought that Brian had eliminated areas where there was no volunteer coverage.

Anne asked if we need more stations within known SAV beds, or more stations outside of SAV. Don noted that there had been no survey in North Carolina since Lisa Wood and Randy Ferguson's work, way back. In Core Sound, there was a very generalized map. They drew lines based on what they saw in the field, and on what they saw in the aerial photographs. Don believes they overestimated the extent of SAV. The question becomes, where do you put points? He explained how they had randomized the points. They sampled points which were outside known SAV, but within the 2-m depth contour, because we want to know whether SAV may have moved in to some of these areas. Don suggested that the sampling might come out better using the new shoreline map. Joe suggested that we should also use the new SAV map. Don concurred that should definitely be the case. Anne made a few suggestions. Don noted if we use the inland boundary of the SAV beds, we won't be getting into the marshes.

Dean asked whether 25% more points could be added for the northern region? He noted that we should take the previous number of points, and increase it by a certain percentage. Then we divide the area up, and identify partners who can assist. These would include NCDMF-Elizabeth City, ECSU, and others.

Jud asked about housing. Wilson noted that Edenton National Fish Hatchery has a house for interns. Joe stated that there is housing at the Lost Colony. Wilson noted that Alligator River NWR has a house in Nags Head. Anne noted that she had stayed there.

Anne noted that Brian Conrad had to spend a lot of time correcting the data sheets. The lat/long has to be correctly entered. Kevin asked if we have a backup person to generate the random points if Brian Conrad is unavailable. Don indicated that he could do them for the fall area only. He has all the points, and when he overlaid them over all the data, there are areas where the rake technique yielded no SAV, but from the aerials there is definitely patchy SAV there. These could be easily missed. There are quite a few patchy beds, in deeper areas, along the Outer Banks. He noted that perhaps he can indicate where patchy beds were in 2007.

John Gallegos asked when the protocols will be released. Anne indicated that they were already done.

Kevin stated that the stations would have to be done soon, if NCDOT was going to fly within two weeks.

Anne asked if one can see SAV in Currituck Sound, in 2 m of water. Joe indicated that it may not be possible when the depth is 2 m. Kevin asked if we have enough time to modify things and generate the points, noting that the time is short. Dean concurred and noted that it took a lot of time to meet with NCDOT.

Don asked how much funding is committed for the survey, for the coming fiscal year (beginning October). APNEP has committed $83,000.

Anne noted that Currituck Sound has low-salinity grasses, which were recommended for video surveys, so why is it targeted for aerial survey? Jud stated that it was sort of a gray area, kind of a transition

zone. A question is, how good was the mission for the last survey? Anne asked John Gallegos if the map seemed to be an accurate portrayal of the SAV present. John indicated that some always gets missed, but overall he felt that it was an accurate portrayal. Jud noted that Back Bay is further north, also along the barrier island shoreline, so the photography should work fairly well.

Jud asked why more points were necessary. Dean replied that more points would permit an accuracy assessment of the imagery. Don concurred, indicating there is a rule of thumb that 50 habitat points should be done for each ground class. In this case, we have only two classes.

Joe asked why cannot bootstrap or jackknife statistical sampling techniques be applied then explained how this would work. The analyst leaves out a certain number of the points, and then re-run the classification to see how well the prediction holds. He wondered if you couldn't do a statistical resampling of the 1,400 points we have.

Don asked if he meant doing an accuracy assessment of the 2007 points? Yes, that is what Joe meant. Joe acknowledged that it is really late in the game for us to be considering doing this. He wasn't sure it was feasible at this point.

Anne indicated that there were 25 stations in Back Bay. North River Landing had 12; Knotts Island had 21; Jarvis Island had some more. There were about 100 altogether.

Anne asked about the fall season being more limited. John Gallegos noted that the oligohaline species are more abundant, and also closer to the surface, in the fall season. Joe stated that they had a diver check the alignment of the mid-Currituck Sound Bridge alignment, and where the SONAR found SAV, there generally was SAV. Joe noted that Brett Hartis at NCSU is working in Currituck Sound, and using the other system. Dean indicated that Brett wanted to attend today but had a prior commitment. Joe noted that he is working on his PhD at NCSU.

It was noted that agency staffs are more strapped this time than in 2007-2008.

John Gallegos noted that USFWS Back Bay NWR is committed to assisting with the survey this time. He noted that Back Bay is exploding with SAV, so they want the data. Anne noted that she was unsure how much effort Kathy Rawls will be able to generate. Dean noted that we would select the points, and then seek volunteers to assist with groundtruthing.

Joe said if we didn't have enough points, we should just double the number of points. Don stated that they overselect points, because they know that some of them will be unusable.

Dean suggested that we say we are going to select 200 points, which would double the density.

Anne noted that everyone she has talked to, is anxious about the effort they will be able to provide, since they are all stressed. Don indicated that he would look at how many points they had actually suggested in 2007-2008. Joe noted that a large number of points may have been selected, and they may not have used them all.

John Gallegos asked about dates for sampling. Don noted that it would depend on the weather conditions for flying. Dean asked how critical it is to have the groundtruthing done before the flying.

Anne indicated that in 2007-2008 they had a six-week window. Jud suggested that there should be a two-week window, in which the points need to be groundtruthed.

Jud noted that the most ideal time to do groundtruthing will be after the first cold front of the season. This should provide for a couple of days of optimal conditions.

Dean noted that after next week, we will begin to look at the weather, and if we have optimal conditions, we need to authorize the flights.

Anne indicated that we need to have someone keep an eye on the weather. The last time, it was someone from USFWS and ECSU. There are criteria with regard to the wind and time, which we could use. Dean said that you also need someone who is measuring water clarity. Jud asked if John Gallegos could help out with that parameter. John indicated that he could do this himself. Joe noted that there is a NCWRC education facility on the northern Outer Banks, and there is someone there every day. He indicated that there is a dock there, and we may be able to get someone on the staff there to take a reading for us. Dean suggested if we have John Gallegos, the NCWRC folks, and ECSU, then we would have pretty good coverage. Someone suggested that the NC Aquarium folks might be able to assist as well.

Jud asked John Gallegos how representative is a sample from their dock. John explained that the dock is in a shallow cove, off the Bay. Jud stated that a Secchi disk might not be very useful, depending on the water depth.

John Gallegos indicated that if there are several days of north winds, the water depth will be so shallow that the Secchi disk will rest on the bottom. Joe suggested that the reading should probably be taken in eight feet of water.

Don noted that we need to locate at least three people who are located in the area, and really know the areas, and give them the same criteria. Anne asked who could check with the NCWRC education center staff. Dean and Wilson will find out with whom to talk, through Cindy Carr.

The group discussed the need to have local people who are going to be out on the water. Kevin asked about getting someone from the NC Aquarium. Dean noted that it is north of US 64, so it would be in their area.

Jud asked if the general opinion is that the first acquisition was okay. Yes, it was generally perceived that it was. What he was getting at is that there must be some information on the conditions that were detected on that day. Anne indicated that she has some e-mail messages which were provided. Jud suggested that using those conditions, would provide a minimum boundary for conditions under which NCDOT should be shooting. Anne asked Dean if he had the e-mails from Scott, which would have the depth readings. Dean will check. Anne indicated that she would look as well.

Jud noted that the human eye can see the Secchi disk in tannic water, further down than the spectrum of PAR penetrates. There are some nice published studies on this problem. This suggests that you want to be even more conservative with the Secchi disk readings. Furthermore, one should not use polarized lenses to take your reading.

Dean noted that we had lots of ideas about getting recruits to check stations.

John Gallegos asked if we can use the same 2007-2008 data forms during this mapping. Anne indicated that is the case. John Gallegos asked to whom should the forms be mailed. Don indicated that would be determined later. Jud asked John Gallegos to take some Secchi readings on the dock tomorrow. Anne noted with all the rain up there it may be very turbid. Jud suggested that John Gallegos take Secchi readings every day, and send them to him and Don. Don noted that in Bogue Sound the turbidity has been high lately.

Anne asked if anyone knows Cameron Swain in Currituck County. John Gallegos does not know her. Anne noted that they may have the ability to put a boat on the water.

3:00 pm: Dean asked that we take a break.

During the break there were multiple sidebar conversations discussing sample methodology, as well as making lists of potential volunteers for doing groundtruthing. Jud noted that it is really important for us to have some idea of the water clarity next week.

3:23 pm: Dean reconvened the meeting and asked John to give his report.

Restoration – John Gallegos

John noted the Restoration Committee has held two teleconferences since February. He had distributed a spreadsheet to the Partnership last Friday, and explained the spreadsheet's contents. Each of its sections was assigned to a Restoration Committee member, who were tasked to provide literature references for five criteria. This exercise arose from the need to respond to the SAV Action Plan, Goal 3. So, they are about one-third of the way into the process. Joe has the life history section; Jerilyn has the section on historical occurrences; Brian had the section on historical research; and …… John Gallegos and Jerilyn have compiled what they have thus far, but are still to hear from others. The committee has not met since June 11. John asked if members had received the spreadsheet. Several (Anne and Wilson) indicated they have. Wilson noted that he hasn't yet reviewed it. John Gallegos noted that the literature compilations they are gathering must go somewhere, but he couldn't see putting them into a spreadsheet.

Anne asked if the spreadsheet he sent was still blank. John stated that each committee member is supposed to be completing their section of the spreadsheet, with literature references which deal with particular stressors. Anne suggested that they prepare a separate document with the references, placing the information from the references in the boxes. Joe suggested that the references could simply be numbered and referenced that way.

John Gallegos noted that he could number them.

Anne suggested if there were a lot of references, we should use the more recent ones. Jud suggested that the list should be prioritized.

Wilson noted that 15 years ago ASMFC had produced a Habitat Management Document on SAV. He will provide that to SAV Partnership members. He noted that the first chapter in it was written by Thayer, Fonseca and Kenworthy. He suggested that he and Jimmy should raise the question to the ASMFC Habitat Committee about updating the document, since it has been 15 years.

John Gallegos reviewed the spreadsheet, noting that they had divided it up geographically. The species list is not necessarily complete. He specifically addressed the *Myriophyllum* spp. complex. Jud asked if one of them is invasive. John advised that parrot feather is invasive. Some of them are native species.

Anne asked if given the purpose of this exercise is restoration, whether the compilation should be more generic, because it may be hard to get specific information for each species. Joe indicated that they had decided to begin with specific species and aggregate later. They felt that was an easier approach. Anne indicated she would have started from the opposite perspective.

John Gallegos asked about whether they should even include an invasive species in the table, given perhaps that SAV presence was better than absence. The group's sentiment was to not include invasives. Also, based on Anne's comment, they will look into lumping the recommendations for poly- and mesohaline species.

John Gallegos noted they are having trouble getting everyone together because committee members are not responding to scheduling inquiries, so he doesn't know when they will meet again.

Anne suggested that the committee should begin their work with documents like the Coastal Habitat Protection Plan (CHPP), and the ASMFC Habitat Management document, and perhaps assign it to one person. John Gallegos indicated that he could assume that task. Anne suggested that once the spreadsheet was completed, then they could have a meeting and see where to proceed.

John Gallegos wondered whether there would be any overlap between the Monitoring and Assessment Committee's work, and what they are doing in terms of compiling information on SAV restoration. He doesn't want to duplicate effort.

Dean felt in the near term, there isn't much potential for overlap. With regard to monitoring, they know where they are going. With regard to assessment, the APNEP 2012 Ecosystem Assessment will soon be released (Jud and Don were co-authors with Dean) and the SAV section therein covers acreage, and the map, and what is visible and what isn't.

Jud noted that one recommendation which they will include in the CRFL report is that it is difficult to design a monitoring plan for the state, because little information exists. Eventually, the comprehensive SAV map could show areas with potential for restoration. Until we have a map, there may not be much overlap, but eventually there could be. Jud felt it would be years before such a map exists.

Dean stated that once we have the new map, we can show where SAV was in 2007, and then where it is in 2012. Scott Chappell had done a map of historic distribution, so if we do this again, we can document where SAV existed in the past. That would only be one piece of information to go into the calculation. Certainly showing where it has been would be a starter.

John Gallegos noted that Action Plan Goal 3 does mention developing an SAV restoration matrix. This could be used for dealing with that objective. This present matrix is the one to be used for Objective 1 of Goal 3, so it sounds like they are on target. This overlap won't cause any duplicate work, he thought.

John Gallegos thanked Anne for her suggestion. Joe noted that there is a publication on SAV restoration. John indicated that he has that reference.

Wilson suggested that Jay O'Dell of the Virginia Chapter of TNC, would be another potential source of information, because Jay had worked extensively on *Zostera* restoration on the Eastern Shore.

Jud provided some additional information on another resource.

Outreach –

- **SAV overview document for public officials**

Anne noted that she is the only one here from the Outreach Committee. She indicated that she has been working on some outreach materials. Someone with Sea Grant is working on that, along with Gloria Putnam. Other information is on the SAV Partnership. She noted that Wilson had suggested that such information would be useful, in some other management forums, such as the ASMFC Habitat Committee, and the SAFMC.

- **SAV signage at boat ramps (CRFL application)**

Anne said that an educational sign has been installed at the Lewis boat ramp. The Committee asked that the sign be modified to enable boaters to avoid one particular grass bed. Ben had come up with the idea that additional signs also would be useful at ramps where SAV was nearby. Another project is for there to be SAV fact sheets.

John Gallegos noted that Gloria was collecting a list of agencies which may wish to disseminate information.

- **Partnership visibility** – Wilson Laney

Wilson recommended that the SAV Partnership seek to make presentations to the following institutions which should have an interest in hearing about the program: Atlantic States Marine Fisheries Commission Habitat Committee; South Atlantic Fishery Management Council, Habitat and Environmental Protection Committee; Southeast Aquatic Resources Partnership; Atlantic Coastal Fish Habitat Partnership, Steering Committee; and South Atlantic Governor's Alliance, Healthy Ecosystems Team. Additional ones for consideration: NC Marine Fisheries Commission, NC Wildlife Resources Commission, NC Coastal Resources Commission, NC Environmental Management Commission, Virginia Marine Resources Commission, and Virginia Game and Inland Fisheries Commission.

Wilson felt it was important to get the message about the Partnership, and the Partnership's work, out there in front of the funding agencies, and also the decision makers who talk to legislators. Wilson suggested that the Outreach Committee also prepare a PowerPoint.

Jud suggested that we produce a presentation, which would then be posted on the APNEP web site.

Wilson thought that was a great idea. He suggested that we try to get a video produced, and have it posted on YouTube. He noted also that there were several teams of folks who had produced videos for various National Wildlife Refuges in the area.

Jud noted that there was a Department of Interior initiative with a big meeting held at the NCTC in Shepherdstown, West Virginia, which he thought had produced a video. He produced text for it, but has never seen the final product.

Jimmy noted that there is another video, which is produced under the auspices of the Core Sound Waterfowl Museum, which says a lot about SAV as well. Jimmy has seen that one and said that it is well done.

Kevin noted that there was a NCDOT-funded project conducted by Stacy Nelson, which sought to monitor SAV using satellite imagery. Jud stated that he and Mark Fonseca had reviewed it, and found some major issues with it. Kevin noted that NCDOT has on occasion funded proposals, even if there were serious problems with it. Don noted that he had also commented on the proposal, and raised some issues. Kevin indicated that he would try to track that one down and see what happened. Jud noted that another issue was the proposal had very limited, if any, groundtruthing.

Anne noted that before he left Brian had suggested that we could hold a restoration workshop to review all of the latest and greatest methods. She suggested that once the Restoration Committee gets their table completed, we could use that to direct the next meeting.

Summary Discussion on 2012 Overflights

Don noted that NCDOT will want to have one sole contact for this project. He didn't mind being that person, but he shouldn't be, because he isn't located in the tar. It should be John Gallegos, or someone else. Dean clarified that he meant the person making the call on the water clarity. Anne noted it is much easier to have someone in the area: perhaps one of the NCDMF shellfish section staff in the Manteo area could be responsible. She asked who was in charge of contacting all the potential water clarity monitors. Dean indicated that he had a list. Joe indicated that he has a list of all the people who were involved in 2007.

Anne read her list of potential groundtruthing participants: John Gallegos, Back Bay; NCWRC Education Center (Dean and/or Wilson to secure contact); Manteo Shellfish Office; Cameron who Anne knows. She will provide that list to Dean.

Don Field indicated that he would select sample points, and get in touch with Brian Conrad when Brian returns. Anne indicated that Craig Hardy is Brian's boss, and Craig is away at the moment. If Anne hears anything, she will let Don know.

Next meeting scheduling

Dean asked if a late fall meeting should be anticipated. The group's sentiment was to have one. Dean noted that one topic was to discuss lessons learned. John Gallegos asked if we need to have a meeting before the survey. Dean noted that was not possible. We will shoot for a December date. Dean noted that he, Anne and Wilson would talk, and then do a Doodle poll and get a date on the calendar.

Adjourn

The meeting adjourned at 4:11 pm.