RESPONSES TO QUESTIONS REGARDING DRAFT SYNTHESIS OF BAS: CHAPTER 2

WETLANDS (Adamus, 2011). Adamus responses in **bold.**

1. Why does the analysis in the Draft Synthesis focus on "hydric soils"? What is the basis for this approach to identifying and delineating wetlands? What is the authority for that approach? How is it supported by BAS and the legal definition of a wetland?

**Areas mapped as hydric soils are not always synonymous with jurisdictional wetlands, and nothing in the BAS report claims that. Nonetheless, from the author's experience such areas have a higher-than-average probability of containing jurisdictional wetlands. Thus, county soils maps showing hydric soils are useful for gross estimates of the area of possible wetlands in a county, but are never intended for site-specific regulatory use.**

2. Isn't it true that the real test for a wetland is that the area must be inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions -not wet or moist, but saturated?

**Yes, that is generally true.**

Do all of the wetlands proposed to be designated in San Juan County satisfy this fundamental test? If so, what data support that conclusion?

**The County has not designated any possible wetlands as jurisdictional as part of this BAS effort. That can be determined definitively only by on-site inspection by a qualified wetland professional.**

3. It is suggested that NRCS soil maps that list areas where soils that can develop hydric soil characteristics are definitive and will automatically mean that these soils are present and have developed hydric soil characteristics. What is the basis for that proposition?

**The BAS report does not claim the NRCS soil maps to be definitive for hydric soils. Statistics presented in the report on the extent of hydric soils refer only to coarse-scale maps, not the type of detailed on-site analyses that you mention. This in no way affects the conclusions or recommendations of the BAS report.**

Isn't it true that the NRCS does not recommend the use of the soil maps for wetland jurisdictional determinations, recommending instead that studies be conducted by a well trained soil scientist (or geologist), because these maps were not prepared for this purpose and are only meant to provide general information that would be used for agricultural purposes?

**Yes, that is true, and nothing in the BAS report claims otherwise.**

4. Why doesn't the Draft Synthesis discuss wetland hydrology (which is ground water hydrology and requires a specialty license of hydrogeology)?

**Wetland hydrology is mentioned in several places. University professors familiar with the subject do not need a license in hydrogeology to write knowledgeably about hydrogeology in their publications.**

5. Isn't it true that the primary "indicator" of a wetland is saturated soils which means ground water must be present during the growing season close enough to the ground surface to be in the root zone to affect the type of plants that must be adapted to living in saturated soils? Isn't it also true that the ground water in these soils must be anaerobic and reducing, which, in turn, limits the types of plants that can survive to specially adapted true hydrophytes?

**Those statements are mostly true, and nothing in the BAS report is intended to contradict them. In some cases the BAS report expressed wetland jurisdictional definitions in more colloquial terms to make the report more understandable to the average non-technical reader. There are varying degrees of reducing conditions, and regardless of the types of plants present, even mildly reducing conditions can alter usual biogeochemical processes and thus wetland functions.**

6. Why does the analysis in the Draft Synthesis focus on "primarily-associated species" rather than limiting the analysis to true obligates?

**Because loss or degradation of wetlands will have a disproportionate effect not only on obligate species, but also on those that characteristically are primarily associated with wetlands.**

7. Isn't it true that the only way a wetland can have saturated soil and still be classified as a wetland is if source of the hydrology is ground water?

**No, not the only way. For example, the internationally-known and thoroughly peer-reviewed wetland hydrogeomorphic classification (HGM) recognizes several wetland classes that are not groundwater-driven.**

Why doesn't the Draft Synthesis focus on the geology of San Juan County to determine the most common geologic settings that create near, at surface, or emergent ground water conditions to provide a starting point for the identification of true wetland areas in San Juan County.

**The goal of the BAS effort was not to "identify true wetland areas" but rather to summarize scientific literature, local spatial data, and expert opinion. While the approach you describe has some merit, it requires detailed inspection of individual sites during multiple seasonal visits and therefore was not practical or affordable as part of a countywide effort.**

8. How can LiDAR imaging substitute for these fundamental hydrologic determinations in the identification of a wetland?

**It cannot, nor was it intended to as part of this BAS effort, and the BAS chapter does not claim otherwise. LiDAR was used as one of several tools to identify areas that <u>might</u> be wetlands, but only on-site inspection will tell for certain. This is noted in the report. Many**

**areas that are wetlands cannot be reliably detected by LiDAR, so omissions are far more likely than commission errors.**

9. Given that one of the primary reasons that wetland areas are valuable and must be protected that these areas remove pollutants (water quality function) doesn't requiring a buffers to prevent pollutants from entering wetland areas negates this fundamental function of the wetland and one of the reasons for protecting wetlands?

**No. Buffers are needed partly to protect the quality of the water flowing into wetlands. Although once the water enters a wetland it can be purified to some degree by the wetland, by the time that happens, the plants and animals that live in a wetland can be harmed by the pollution. Laws require that wetland habitat functions not be impacted by development. A buffer does not negate the ability of a wetland to process whatever pollution happens to enter it; if anything a buffer might help sustain this wetland function.**

10. Isn't it true that wetlands in San Juan County are not considered to provide protection from the types of flooding experienced here?

**Yes, the wetlands have limited effect on minimizing property damages, and that is clearly noted in the BAS report.**

Accordingly, why doesn't it all boil down to wildlife habitat, which it to be protected under another critical area classification?

**It doesn't just boil down to wildlife habitat. Depending on the type, wetlands perform many other useful functions, such as carbon sequestration, fisheries support, and detoxification of some pollutants.**

11. In another part of the Chapter there is discussion regarding the hydrology of surface water conveyances, but unless the conveyances are naturally occurring streams (i.e., that meet the scientific criteria for streams), what does this have to do with wetland creation or maintenance?

**That is a legal question, beyond the scope of this BAS review.**

12. Isn't it true that on-site inspections are necessary not only to for purposes of rating a wetland and defining its boundaries (since the County's maps are found to be inaccurate) but, more fundamentally, to determine if a wetland is present in the first place?

**It depends on the purpose. For permit applications, an on-site inspection is required, but no law requires that county-level planning efforts such as this base their results on inspections of every area thought to be a wetland. No other county does.**

13. Isn't it true that the only way to properly conduct the necessary field hydrology studies is to include depth studies that may include the installation of properly constructed piezometers that are equipped with pressure transducer dataloggers that record the ground water elevations frequently over the growing season (for one year, at a

minimum)?

**It would be awesome if every county or landowner could afford to do that for every suspected wetland, but obviously they cannot. So it depends on what you mean by "the necessary" field hydrology studies, i.e., what their intended purpose is.**

14. Isn't it true that many plants, including red alders, can contribute substantial amounts of nitrogen to the soil as can other types of nitrogen fixing vegetation? Isn't is also true that nitrogen occurs naturally in the environment and is a valuable and necessary element required for healthy plant growth?

**Certainly. And organisms in wetlands and coastal waters are accustomed to dealing with the levels and seasonal chronology of nitrogen inputs from natural sources. But when additional new sources are introduced, e.g., septic systems and road runoff, a potential exists for overenriching the receiving waters and consequently shifting their species composition to an assemblage of tolerant species of less benefit to humans. Too much nitrogen is not healthy for most plants.**

15. Are any wells located in San Juan County found to exceed primary drinking water standards? If so, which ones and when were they tested and by whom

**Not all wells are tested regularly, but in any case this information is not relevant to protecting wetlands and streams from harm that is likely to occur from <u>future</u> developments, based on relationships that have been observed elsewhere.**.

16. At Section 23.1 the Draft Synthesis states: "By area, most of the naturally-occurring non-tidal ("upland") wetlands in SJC do not contain surface water year round. They depend entirely on shallow groundwater (springs and seeps) and runoff during and immediately after rainstorms. Thus, the hydrologic balance and continued existence of these wetlands is always precarious." What is the basis for the proposition that these areas are actually wetlands at all, because surface water without ground water will not lead to saturated soils and by definition, wetland soils must be saturated?

**Indeed it is true some of these areas may not be jurisdictional wetlands (only field-checking would tell). But that in no way affects the conclusions of the BAS report. If it accumulates for long periods, surface water without ground water will support saturated soil conditions. This may be only a semantic distinction between what is considered ground vs. surface water at any moment.**

17. Are any of the animal or plant species identified in the Draft Synthesis completely dependent on wetlands for their survival and well being? Which ones?

**Yes, all the nesting waterbird species (except those that nest in marine habitats), all amphibians, and most wetland plant species denoted as obligates.**

18. Isn't it true, regarding establishing or restoring wetlands that, the reason for high failure rates is because the areas were not wetlands to begin with and the design did not establish the required hydrology in soils that will develop hydric soil characteristics?

**Attempting to establish wetlands in areas that were not initially wetlands is a significant cause of establishment failures. It may not be a significant cause of the failure of restoration projects. "Failure" is a subjective judgment in either case.**

19. The Draft Synthesis discusses potential disruption of birds by humans and their pets, but fails to discuss disruptions from other wildlife, including predators. Why aren't these natural disturbances by other wildlife compared to disturbances caused by humans and their pets evaluated to address likely threats to these species? Considering the populations of wildlife in these areas, wouldn't disturbances from natural causes be expected to much more significant than those by humans and their pets?

**Of course predators can disturb native wildlife in a manner that sometimes is similar to humans and pets. But this was not worth noting in the BAS because the real problem is that the disturbance from humans and pets is <u>additional to</u> the disturbance from natural predators, and is thus more likely to push wildlife beyond their ability to cope with harassment.**

20. Regarding the 2010 Wetland Study, what are the professional qualifications of the persons who worked with Dr. Adamus in conduction the study? Please provide a complete professional CV for each of them.

**The data collected from that study have not been used to advise buffer widths or other key aspects of the BAS report. The field persons were trained by Dr. Adamus.**

21. Why didn't the study "attempt to rigorously determine the health of SJC wetlands, determine trends in wetland acreage or alterations, or determine the degree to which existing regulations are whether achieving their objectives"? See Draft Synthesis at 7. Isn't that information essential for determining whether it is necessary to make any changes in the current San Juan County provisions protecting wetlands?

**No other County BAS has done that, and it is not required by laws at any level of government. Even if time and resources to conduct such studies were available, there are few if any regionally valid standards for judging whether or not a wetland is healthy.**

22. Why wasn't it necessary to review "even most" of the potentially relevant studies regarding wetlands, buffers, and habitat fragmentation in preparing the Draft Synthesis?

**While desirable, there was not the time nor resources to do that. Moreover, no county has done that as part of their BAS review. Nonetheless, this BAS effort reviewed more studies on these topics than any county BAS that preceded it, and reviewed more recent (from the present decade) literature on these topics than even Ecology's own BAS document. And finally, the existence of recent peer-reviewed journal articles that used meta-analysis (i.e., they statistically analyzed results from a large number of other studies) greatly expedited this review.**

23. At page 24 the Draft Synthesis includes "Beautify the Landscape" as a fourth wetland "function." What is the basis for the suggestion that this is an appropriate basis for

restricting land use on a host hoc basis?

**In the BAS report there is no suggestion, explicit or implicit, that that is the case. Preservation of open space in many communities has increased property values overall.**

24. At Section 2.4.5.1 the Draft Synthesis lists "often cited potential benefits of buffers." Why doesn't the Draft Synthesis actually evaluate those asserted benefits rather than simply accepting them because they have been suggested?

**The Draft BAS does evaluate those asserted benefits – in fact, it spends over a dozen pages doing so, in greater depth and with more documentation than in any other county BAS document.**

25. At page 55 the Draft Synthesis cites "Lowrance et al. 1997," but that reference is not included in the Literature Cited Section. Please provide a full citation to this reference so that members of the public can identify and review it.

**Lowrance, R., G. Vellidis, R.D. Wauchope, P. Gay, and D.D. Bosch. 1997. Herbicide transport in a managed riparian forest buffer system. Transactions, American Society of Agricultural Engineers 404:1047–1057.**

26. Why is "Buffer Width for Protecting Habitat and Wildlife Species" in this chapter when Chapter 4 is devoted to the protection of habitat? See Section 2.4.5.4.

**Because the Department of Ecology recognizes that Habitat is a function of wetlands, and laws require that wetland functions be protected. The availability of more information on Habitat in Chapter 4 is mentioned in Chapter 2.**

27. Please explain how Table 2-3 can be interpreted by the public with reference to actual places in San Juan County?

**In its present form it cannot. As noted in the accompanying text, details will be worked out once the County Council has adopted (or not) the concept of variable-sized buffers and the use of these particular factors for determining those.**

28. Please provide a list of all the locations where Dr. Adamus performed the referenced studies were conducted? Many of these references are not available online and due to the limited amount of time allowed for review of this document, it is impossible to check every reference.

**No county BAS has done this with the literature they reviewed, and while it might be interesting, it is not necessary because many factors other than geographic location are likely to have influenced the conclusions of buffer studies. Many or most of those factors were accounted for statistically in the meta-analysis publications that the BAS report used when arriving at options for buffer widths.**