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To Whom It May Concern:

Please find attached the Minnesota Chapter of The Wildlife Society's official comments on the proposed **State Off-Site Methodology for Wetland Determinations, Federal Register Docket Number NRCS-2014-0013.**

Wetlands are four dimensional systems that change in space (including elevation) and time yet we use policies and maps that are two dimensional in nature. Even in a system that relies on photos taken at exactly the right time of day, time of year, scale and digital accuracy, there would still be wetlands incorrectly identified due to the dynamic nature of wetlands. This is exactly why field reviews are critical to wetland identification and delineation.

With the past and proposed State Off-Site Methodology (SOSM) approach, the error associated with wetland determinations will be unacceptably high. It is imperative that future SOSM uses the most up-to-date remote sensing technologies (RADAR, LIDAR, digital multi-spectral aerial and satellite imagery) consistent with the wettest portions of the growing seasons to determine the maximum extent of all wetlands over time with the flexibility to conduct field verification.

It should be remembered that timing of the annual aerial photography obtained by USDA is based on crop compliance requirements and is not meant solely to identify wetlands. Therefore, a strict parameter for wetland delineation should not be used. Photos are often taken outside of the prime window – i.e., the wettest portions of the growing season. There are no published studies using NAIP imagery which identifies temporary or seasonal wetland signatures as *consistently identifiable* two to three months into the growing season.

In discussions with Minnesota NRCS, cost has been listed as a prohibitive factor behind the continued use of 2' resolution LIDAR given the availability of much more accurate 6-12" LIDAR currently in use. While less expensive, the lower resolution dataset is of more limited use in some circumstances, e.g., in delineating shallow basins. In addition, this approach does not appear to be a plausible long-term strategy given the State of Minnesota and the Legislative Citizens Commission on Minnesota's Resources (LCCMR) has already invested nearly 10 million dollars to obtain state-wide, *spring*, stereo, four band, $\frac{1}{2}$ meter, digital aerial imagery and 6-12" LIDAR imagery for one of the primary purposes of updating the Minnesota Wetland Inventory. The southern 1/3 of the state will be completed this spring.

The changes required to correctly and consistently identify wetlands with shallow basins may seem technical in nature but they have very real world consequences. Seasonal and temporary wetlands are the first basins to melt in the spring and support thousands of returning migrant waterfowl. They are full of invertebrates, providing a food sources at critical points of waterfowl migration, egg development, and fledgling success. These wetlands also provide known ecosystem functions such as flood storage, nutrient retention and groundwater recharge.

We recommend that the SOSM be further reviewed for accuracy in delineation techniques. We are available to work with your agency to protect wetlands within Minnesota.

Our comments include a set of questions (Attachment 1) and comments (Attachment 2) regarding specific pieces of the proposed SOSM system for Minnesota. Attachment 3 includes a series of images that illustrate why wetlands should be addressed as a four dimensional feature.

Sincerely,



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ATTACHMENT 1

QUESTIONS REGARDING PROPOSED STATE OFF-SITE METHODS

- How does NRCS plan to reconcile the requirement to base decisions on conditions present “during the wet portion of the growing season under normal climatic conditions” when the normal annual aerial imagery used in desktop review would be produced in summer months?
- There is disagreement between what is in the Federal Register document and what was presented at the State Tech Committee meeting, which makes the possible range used anywhere from 2-10 years. How many years of imagery will be used for off-site wetland determinations?
- Temporary and seasonal wetlands are most likely to be misidentified if done remotely; soil surveys are not an adequate replacement for on-site review as they contain errors and hydric soil inclusions which cannot be reconciled in an office. Would the presence of hydric soil inclusions in the soil map trigger an on-site review?
- It was noted in the presentation given to the State Tech Committee that wetlands that are on NRCS wetland inventory maps may end up not being “wetlands” in final determination using an offsite review methodology. How is this possible? It seems to point out an inherent problem in the use of off-site review and questions whether existing wetlands previously identified in NRCS maps will now be removed from final determination maps.
- Temporary and seasonal wetlands are defined by their shallow basins. The off-site method will use landform with 2' contour indicators to define hydrophytic vegetation. However, 2'contours are not reliable indicators of depressional landforms which could support these types of wetlands. Will there be a commitment to use 6-12 inch LIDAR contours **only** when hydric soil inclusions are noted on the soil survey? Should there be an absence of 6-12 inch LIDAR data for individual projects, will this trigger on-site review?
- The following questions refer to the table in SECTION 3.6 of the SOSM document (Table 1, p. 16):
 - There is an example with a “Y” for all three wetland factors in Step 1, but still classifies as a “NW” (4th row down). Please clarify how it can be considered both wetland and non-wetland.
 - Please clarify ponding duration column.
 - What are the impacts/uses of the Landform column in wetland determination beyond a secondary measure of hydrophytic vegetation?
- A number of new technologies and methodologies exist which are more accurate than summer aerial imagery and are available in the season most likely to show wetland signatures. What are the standards for use of current technology and will it be required for off-site assessments?

ATTACHMENT 2

COMMENTS SPECIFIC TO THE FEDERAL REGISTER SOSM PROPOSAL

SECTION 1.0

- MNTWS fully agrees with the statement on line 28-29, pg 4, “wetland identification decisions are based on conditions that are expected to occur under Normal Circumstances”.
- MNTWS also fully agrees with the statement that “normal circumstances” be defined as “the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed (7 CFR section 12.31(b)(2)(i),” from lines 30-31 on pg 4.
- It is critical that “normally present” continues to be defined just as recorded on lines 40-41, pg. 4, as the vegetative, soil, and hydrologic conditions that occur**“during the wet portion of the growing season** under normal climatic conditions (normal environmental conditions)”.
- This above statement then says that wetland identification decisions are based on conditions **during the wet portion of the growing season** under normal climatic conditions. MNTWS believes this is a very critical statement that needs more attention brought to it as the development of base maps and the use of imagery needs to be tied to “the wet portion of the growing season.” This statement of “wet portion of the growing season” should be further defined in the SOSM’s. In Minnesota, “the wet portion of the growing season” is the month of May or the first month of the growing season in most cases. It should be more precisely determined from precipitation data from the nearest weather station to the site.
- If this imagery from the “wet portion of the growing season,” i.e., May, is only available for some, but not all past “normal” years, the available May imagery should still be used. If imagery is not available during May for any of the past normal years, then NRCS should use imagery closest to May, i.e., pick a June image instead of a July image. Also, NRCS should be developing plans to acquire this May imagery (“wet portion of the growing season”) in future years, because wetland identification of all wetland types (temporary, seasonal, semi-permanent, permanent, etc.) completed remotely depends on use of the correct imagery to answer a “Yes” or “No” to the Hydrology remote indicator. If July/August imagery is used, most if not all temporary wetlands will have been dry for at least a month and many seasonal wetlands will not be identified, b/c they have dried up by then. Many temporary and seasonal wetlands are dry by planting time and farmers till/plant right through them, making them virtually unidentifiable from air photos. This is why it is critical to use “wet portion of growing season” imagery.

SECTION 2.0

- It is very difficult for the most experienced wetland reviewer to complete a quality wetland determination for temporary and seasonal wetlands remotely. Variables in climate, surrounding land use, angle and scale of aerial photography are just a few of the factors at play. The biologist needs to see the hydrophytic plants in the field, see the hydric soil in his/her hand in the field, and find all the little depressions in a field from on-site. SOSM rely totally on published soil surveys to determine hydric soil – there are well known errors in these surveys. Hydrophytic

vegetation is determined by looking at vegetation tied to the OSD – there are simply too many subjective decisions to be made without a field review.

- Semi-permanent and permanent wetlands that almost always have surface water present are easy to identify; SOSM is an appropriate approach for completing wetland determinations of semi-permanent and permanent wetlands.
- MN TWS fully supports using the Level 1, 2, and 3 approaches for semi-permanent and permanent wetlands.
- MN TWS does not support the use of a Level 1 wetland determination for temporary and seasonal wetlands. Biologists should be required to go on-site to do the determination (Level 2 or 3).
- Line 40-43, pg 6 – we are encouraged that the agency expert retains the responsibility to determine when a level 2 or 3 decision is needed. However, there need to be triggers built into the protocol that require “the USDA biologist will go on-site when.....”. Example would be when hydric soil inclusions are present in the soil map unit, to find those inclusions and make sure they are mapped.

SECTION 2.1 – Develop a Base Map

- 2.1A – MN TWS noted that in the presentation given to the state tech committee, wetlands that are on NRCS wetland inventory maps end up not being “wetlands” in final determination – how? So, can NRCS wetland inventory basins be taken off the final determination map? If so, why?
- 2.1B – lines 13-45, pg. 7. “Review appropriate imagery.” ***This is by far our most important set of comments, see below:***
 - “Appropriate” imagery should be imagery from the “wet portion of growing season,” not imagery from July and August, the dry part of the growing season. This would likely mean that agency experts should be using May imagery.
 - Lines 26-28, pg. 7, say “the term ‘appropriate’ means that the agency expert will select the imagery year or years that best represents Normal Circumstances, including “Normal Environmental Conditions”, to identify and size sampling units. Page 4, line 40-41, says that Normal Circumstances are “**during the wet portion of the growing season** under normal climatic conditions.”
 - **Thus, we cannot stress enough that imagery used should be from the wet portion of the growing season.**
 - MNTWS is not challenging how normal climatic conditions are determined, but we do think it is critical that imagery is used from the wet portion of the growing season.
 - “Wet portion of the growing season” needs to be explicitly defined.
 - If “wet portion of the growing season” imagery is not available, there needs to be a plan to acquire this imagery in future years. There could be a potential partnership between MN DNR, USFWS, and USDA to acquire this imagery.

- Line 30, pg. 7, says that 2-4 different images will be used. We understand they will be “Normal” images, but which 2-4 years? Starting with the most recent normal year, then working backward from there?
 - This statement is in direct conflict with the presentation gave to the MN State Tech committee which states “select at least 5, but no more than 10 normal years, starting with the most recent normal year.”
 - So, how many normal year images will be used? Sounds like from 2-10? There needs to be a set number to be fair because determination of yes or no on the hydrology indicator is determined by at least 50% of images with CT or INU. 50% of how many images?
 - The expert should be review ALL available imagery, not just FSA imagery (see line 47-48, pg.6.)
- 2.4D – review soil survey and county hydric soils list
 - It is critical that soils with hydric inclusions are also mapped, because most temporary and seasonal wetlands are likely inclusions in a broad upland soil map unit.

SECTION 2.2 – Hydrophytic Vegetation

- How do you verify the presence/absence of hydrophytic vegetation without going into the field to see for yourself?! MN TWS strongly supports a level 2 or 3 survey (field survey) to determine presence of hydrophytic vegetation along with level 1 methods.
- In MN State Tech Committee presentation, the NWI map indicated PEMA (temporary) wetlands were present, but the end result was **not** checking YES in the hydrophytic vegetation box. Why?!
- According to lines 48-49, pg. 8, if mapped in NWI, it should meet the hydrophytic vegetation factor. MNTWS supports this statement.
- Comments on lines 1-4, pg. 9. Using the “use and vegetation” or “remarks” sections of the OSD can help determine when hydrophytic vegetation may exist, especially when the whole soil map unit is a hydric soil (e.g., Parnell or Valler soils, etc.). The problem is when the soil map unit has minor inclusions of hydric soil within a larger map unit of non-hydric upland soil. **How do you find these hydric soil inclusions and thus pockets of hydrophytic vegetation remotely?** The SOSM methods document does not speak to this topic whatsoever.
 - **MNTWS recommends a level 2 or 3 survey (on-site) if NRCS plans to use the OSD to identify hydrophytic vegetation in soil map units where hydric soil inclusions are present.**
 - The presentation states you can use the landform where the inclusions exist, such as depressions, and then locate closed basins via LIDAR. If in a depression, it is assumed hydrophytic vegetation b/c there is hydric soil.
 - **When determining “depressional” – experts need to use 6-12 inch LIDAR contours, not 2 feet lidar contours to find all temporary and seasonal wetlands less than 2 feet deep.**

- Raw 1 and 3 meter DEM LIDAR is available statewide now. This raw point data can easily be converted to 6 inch contours with the “NTCS Engineering Tools” toolbox in ArcMap software. This software is available to all NRCS employees, so it should be used to generate 6 inch contours to find ALL basins.

SECTION 2.3 – HYDRIC SOILS

- How do you determine hydric soils from only looking at soils maps? Soil cores and field reviews are required to look for the presence of redox, reduced surfaces, etc. to find basins that are inclusions in a broader soil type. Some soil types say hydric soils are inclusions in depressions. It seems temporary wetlands may not be recognized due to use of 2' contour LIDAR. This will not pick up 12" deep temporary depressions which are common in northwest Minnesota. From a computer, as long as you could identify a depression (from 6-12" LIDAR), it should be classified as a hydric soil in the basin.
- All of the sampling units should have been classified as hydric soil!
- Problem with using soil maps to determine the presence of hydric soils is when the soil survey says there are inclusions of hydric soils in a broader map unit.
 - Lines 44-46, pg. 10, say that the landform of the sampling unit must be consistent with the landform of the hydric inclusion in the soil survey. So, if the survey says hydric soil inclusions are found in depressions, the sampling unit must be a depression. The only way to figure this out remotely is via LIDAR. MN TWS recommends using 6-12" LIDAR contours instead of 2' LIDAR contours to identify the site as a “depression.” Many temporary and seasonal wetlands are less than 2' deep thus the need to use finer scale LIDAR.
 - **MNTWS recommends a Level 2 or 3 on-site survey when hydric soil inclusions are noted on the soil survey.**

SECTION 2.4 – WETLAND HYDROLOGY

- Lines 5-7, pg. 11, say “Wetland hydrology is defined as inundation or saturation of the site by surface or groundwater during the growing season at a frequency and duration to support a prevalence of hydrophytic vegetation.” Our point here is that the “growing season” starts in May, so why not use slides from May?
- **Why is NRCS using July photos? By using photos from the middle of summer, most temporaries and seasonal wetlands are already dry.**
- In presentation, PEMA wetlands from NWI were not classified as “wetlands” b/c no hydrology indicators existed – this is b/c imagery was July photos when wetlands are dry.
- “Appropriate” imagery should be imagery from the **“wet portion of growing season,” not imagery from July and August,** the dry part of the growing season. This would likely mean that agency experts should be using May imagery. If not available, we need a plan to start getting that imagery.

- Lines 26-28, pg.7, say “the term ‘appropriate’ means that the agency expert will select the imagery year or years that best represents Normal Circumstances, including “Normal Environmental Conditions”, to identify and size sampling units”. Page 4, line 40-41, says that Normal Circumstances are “**during the wet portion of the growing season** under normal climatic conditions.”
- **Thus, imagery used should be from the wet portion of the growing season.**
 - If this wet portion of the growing season imagery is not available, then field verification is needed (level 2 or 3 survey,), remote indicators can not be determined, and other imagery (from the dry part of the growing season) should NOT be used. By using images from July or August, you immediately exclude all temporary and many seasonal wetlands.
- The Color Tone (CT) and inundation (INU) remote indicators listed are good. We agree that the listed indicators are useful, but disagree on the timing of imagery used.
- Lines 40-43, pg. 11, indicate that “the imagery review will consist of **all** available normal years starting with the most recent year image.” This does not match Line 30, pg. 7, which says that 2-4 different images will be used. Please explain.

SECTION 3.6

- How can a Y for all three wetland factors in Step 1 result in a NW classification?
- Please clarify ponding duration column on page 16. What is the purpose of the landform column?

OTHER GENERAL COMMENTS

- MN TWS fully supports additional funding for NRCS to be dedicated toward more on-site determinations.

ATTACHMENT 3

Illustration of Need to Treat Wetlands in 4-Dimensions (3D Space+Time)

Devil's Lake, ND region showing the water expansion from August 31, 1991 to August 3, 2010 using the coarse resolution Landsat 5 satellite. The first two images show the region which is 50 miles across. The third and fourth images zoom into the farm region ("1") just east of the City of Devil's Lake. The pictures illustrate the issues with past and current SOSM strategies and why the proposed approach using summer NAIP imagery will still be insufficient for wetland delineation. There are similar wetland expansion examples for South Dakota, Minnesota and Iowa as well.

