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**Subject:** San Bernardino NWR Periodic Hydrologic Monitoring Update  
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Juliette and Steve;

In order to collect a "baseline" condition of selected artesian wells on the refuge, it was necessary to temporarily turn valves off at the Twin Ponds, the Hay Hollow Ponds, North Pond, and Mitigation Pond. The goal was to obtain two weeks worth of "baseline" data from these wells, to compare against in determining the impacts of large scale water withdrawal by DHS contractors.

During the week of Dec 2, 2019, water was turned off to the two Hay Hollow Ponds and to North Pond, and pressure transducers were installed and programmed to begin logging. Mitigation Well was previously turned off (water used to fill and maintain Yaqui Pond was stopped and put on hold), and a pressure transducer was installed and began logging at that location on November 29, 2019.

On Dec 10, 2019, Twin well was turned off, stopping flow to Twin1 and Twin 2 Ponds, and a pressure transducer was installed and began logging. Turning off water to these ponds to collect baseline information resulted in the rapid failure of Twin-2 Pond, which was almost empty by Dec. 12, 2019.

On Dec 12, 2019, water was turned back on to maintain Twin 1 Pond, but Twin 2 Pond had already dropped to a dangerous level, and all existing fish in this pond perished. North Pond level measured 1.18 on the staff gauge, and refuge staff will turn water inflow back on after the week of the 20th, once a full two weeks of pressure data has been collected.

During the week of Dec 20, 2019,

- Water to the two Hay Hollow Ponds was turned back on (Dec 16, 2019) since pond levels had dropped 0.5 ft. The pressure transducer was left in place in case pond levels rise high enough to run another pressure test.
- Flow levels were documented; artesian flows appeared fairly consistent.
- Pond levels and ground water well readings will be collected on Dec 20, 2019.
- The Glenn's Hay Hollow Windmill Well on private land adjacent to the NE corner of the refuge was not being utilized when checked on Dec 19, 2019, the hose was not hooked up to it, and was just laid out towards Geronimo Trail Road and ending east of the Glenn Ranch corrals.
- Refuge costs associated with purchasing monitoring equipment is over \$10,000.00. U
- Assistant Manager T. Harden had a conference call on Dec 20, 2019 with Rod Dossey (project environmental specialist contractor) in regards to temporary Black Draw crossing on the border road being repaired. Prior to working on the crossing, contract biologists salvaged endangered fish at the crossing and relocated them upstream on the refuge, and below the fish barrier, in Black Draw. Both the Black Draw culvert crossing and the Hay Hollow Wash culvert crossings were washed out during the late November 2019 flood event, and contractors discussed alternate designs for the temporary crossing, with the ultimate end product to be a metal bridge. Dossey

questioned the multiple damaged erosion control gabions on refuge, as he was under the impression that they were in Black Draw rather than Hay Hollow Wash. Dossey claimed to be completely unaware that contractors had build a culvert crossing upstream of the refuge in Hay Hollow Wash, and this was clarified by Harden who explained the damage to three Hay Hollow Wash gabions and the complete loss of wetlands (critical habitat occupied by endangered fish) due to the catastrophic loss of the contractor's culvert crossing upstream from the refuge. Dossey stated he would raise the Hay Hollow culvert crossing issue with his superiors, asked if a concrete apron style crossing would be more appropriate than the failed earthen levee and culvert style crossing that was constructed at that location, and refuge staff believe this would be a better option. The contract biologists will be out to salvage fish at the failed Black Draw culvert crossing on Jan 2-4, 2020 Dossey stated the repair of the temporary Black Draw culvert crossing is expected to begin Jan 6/7, 2020

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