The City of New Braunfels 2017 Work Plan Summaries

Section	Conservation Measure	Science Committee Review
I	Decaying Vegetation and DO Management	Methodology Review and Input
II	Old Channel Restoration	Update with pending methodologies
	Comal River Aquatic Vegetation Restoration	
III	Reduction of Gill Parasites	Update only
	Native Riparian Restoration	

No review necessary for:

5.2.1 Flow Split Management
5.2.3 Management of Public Recreation
5.2.5/5.2.9 Non-native Animal Species Control
5.2.7 Prohibition of Hazardous Materials Transport
5.2.8 Native Riparian Habitat Restoration (Comal Springs Riffle Beetle)
5.2.10 Litter and Floating Vegetation Control
5.2.11 Golf Course Management and Planning
5.7.5 Management of Household Hazardous Wastes
5.7.6 Impervious Cover/Water Quality Protection/LID

I. Methodology Review and Input:

5.2.4 - Decaying Vegetation Removal and Dissolved Oxygen Management

Measure summary:

Implementation of dissolved oxygen (DO) management program and monitoring of a DO (and other water quality parameters).

2017 Goals:

Develop a comprehensive plan for managing DO concentrations in Landa Lake during low-flow periods. The plan will include an evaluation of existing DO data/ research and identification of feasible, cost-effective mitigation strategies.

Achieved to date:

Near-continuous DO data is available dating back to 2013 with some gaps due to equipment error. Spatial DO monitoring at multiple locations throughout Landa Lake and the Upper Spring Run in June 2015 during average flow conditions with two solar-powered aeration systems installed in Landa Lake in 2013 for possible DO support. Applied Research project on DO dynamics conducted in 2015.

What has worked?

Increased knowledge of daily DO concentrations spatially throughout Landa Lake during average flow conditions and installation of water quality sonde and collection of data to characterize water quality parameters in Landa Lake.

What has not worked?

Have only limited data on DO concentrations throughout Landa Lake and Upper Spring Run during low-flow conditions and existing aerators did not appear to mitigate low DO levels observed in 2014.

Ongoing activities:

1. Assess real-time DO data on a regular basis (data to be provided by EAA).
2. Activate aerators in Landa Lake as DO levels trend toward less than 4 mg/L.
3. Evaluate vegetation conditions for signs of stress or decay on a weekly basis during low-flow conditions.
4. If significant decaying vegetation is evident, the decaying vegetation will be removed. Ongoing removal of floating vegetation mats is occurring through task 5.2.10.

Methods to achieve 2017 goals:

1. Analyze existing DO data and research to help predict DO concentrations during low-flow periods based on the minimum total Comal discharge management objectives set forth in Table 4-2 of the HCP.
2. Evaluate the linkage between observed fountain darters and DO concentrations collected as part of the EAHCP Biological Monitoring Program and EAA Variable Flow Study.
3. Evaluate and consider feasible DO mitigation strategies. Mitigation strategies may include, but not be limited to, artificial aeration, artificial water column mixers, removal of decaying vegetation during low-flow conditions, or other strategies to benefit the fountain darter during periods of depressed DO.
4. Develop a comprehensive DO management plan for Landa Lake Lake that includes and takes into account the items listed above.

Questions:

1. Does the Science Committee know of any additional data available that could assist in predicting DO concentrations throughout Landa Lake during low-flow conditions (<60 cfs)?

2. Does the currently available data suggest a critical threat to fountain darters in Landa Lake during low-flow conditions?

3. Should "protection zones" be established using artificial aeration within areas of Landa Lake where high-densities of fountain darters exist?

II. Update with pending methodologies:

5.2.2.1 - Old Channel Restoration

Measure summary:

Remove non-native aquatic vegetation, expand coverage of native aquatic vegetation and monitor previously restored areas within the Old Channel of the Comal River.

2017 Goal:

Pending completion of the Submerged Aquatic Vegetation Report due in 2016.

Achieved to date:

Plant Type	Table 4-6 (m^2)	November 2015 (m^2)	Remainder (m^2)
Bryophytes	150	4	146
Hygrophila	200	535	335
Ludwigia	1500	7	1,493
Fil. Algae	300	0	300

*Note: Numbers only reflect study reach coverage.

What has worked?

Hygrophila has been completely removed from the Old Channel between Landa Lake and the upstream limits of the Old Channel Index Reach. Old Channel restoration in general has been very successful. Removal of sediment island, MUPPTs, planting of natives immediately following removal of non-natives.

What has not worked?

Removal of non-natives without complete root removal and follow-up gardening. Planting in areas lacking sufficient sun exposure. Establishment of Cabomba with potted transplants.

5.2.2/5.2.3 - Comal River Aquatic Vegetation Restoration and Maintenance

Measure summary:

Remove non-native aquatic vegetation, expand coverage of native aquatic vegetation and monitor previously restored areas within the Comal River.

2017 Goals:

Pending completion of the Submerged Aquatic Vegetation Report due in 2016

Achieved to date:

Landa Lake Index Reach (m^2)			
Species	**Table 4-6**	**November 2015**	**Remainder**
Bryophytes	4,000	730	3,270
Hygrophila	250	0	(250)
Ludwigia	900	475	425
Cabomba	500	240	260
Sagittaria	1,250	2,750	(1,500)
Vallisneria	13,500	12,000	1,500

Upper Spring Run Reach (m^2)			
Species	**Table 4-6**	**November 2015**	**Remainder**
Bryophytes	1,850	35	1,815
Hygrophila	650	0	(650)
Ludwigia	150	1*	149
Sagittaria	600	825	(225)

*Ludwigia has been observed to cover about 100 m^2 by early 2016.

What has worked?

Hygrophila has been almost completely removed from Upper Spring Run and Landa Lake. MUPPTs, native plantings along new walls in Landa Park, intensive removal of non-natives

What has not worked?

The success of Cabomba planting along eastern shoreline was marginal likely due to shading effects. Success of Cabomba plantings at confluence of Spring Run 1 and Landa Lake was also marginal likely due to turbidity issues and waterfowl habitation of area. Potted Cabomba transplants have not been successful.

III. Update on progress only:

5.2.6/6.3.6 - Monitoring and Reduction of Gill Parasites

Measure summary:

Conduct monitoring activities including gill parasite water columns concentrations, fountain darter infection prevalence, host snail density and distribution and snail infection prevalence to define potential threats to fountain darters.

2017 Goals:

Continue existing monitoring program including snail distribution and density monitoring, cercariae water column concentration monitoring, and snail infection prevalence.

Achieved to date:

Continued collection of data to answer pertinent questions related to parasite life cycle, snail densities, snail infection, and fountain darter infection rates.

What has worked?

Continued collection of data to answer pertinent questions related to parasite life cycle, snail densities, snail infection, and fountain darter infection rates.

What has not worked?

Baited traps not effective enough for large-scale snail removal efforts.

Methods to achieve 2017 goals:

1. Conduct annual *Melanoides* distribution and density surveys within four established sampling reaches.
2. Water column cercarial concentration sampling conducted at established transects. Collect water sample, filter sample to 30 micron filter, analyze filter for cercariae with microscope. Samples collected between 9 am and 11 am on sunny days to minimize temporal variances.
3. More frequent monitoring once springflows fall below 100 cfs.

5.7.1 - Native Riparian Habitat Restoration

Measure summary:

Increase native riparian vegetation coverage, reduce non-native riparian vegetation, and prevent streambank erosion that will compliment aquatic vegetation restoration efforts.

2017 Goals:

Maintain previously restored riparian areas along the Old Channel of the Comal River between Landa Lake and the Golf Course Road bridge crossing (i.e. maintenance of riparian restoration installed in 2016 as part of the Bank Stabilization and Riparian Restoration project). Remove non-native riparian vegetation along the Old Channel of the Comal River between Golf Course Road and the Old Channel Index Reach. Removal of non-native riparian vegetation and select native vegetation will first be targeted to locations that will increase solar penetration and compliment aquatic vegetation restoration efforts. Install erosion control structures along channel utilizing removed non-native vegetation.

Achieved to date:

Development of plans for the stabilization of the eroding bank of the Old Channel and associated riparian restoration. The bank stabilization and riparian restoration project commenced on May 2nd, 2016 and is expected to be completed in the Summer of 2016.

What has worked?

Stabilization of eroded cut bank and restore riparian zone associated with the bank stabilization project (pending 2016 work).

What has not worked?

N/A

Methods to achieve 2017 goals:

Non-native riparian vegetation will be removed utilizing herbicide applications and hand-removal methods. In areas containing only non-native riparian vegetation, only a portion of the vegetation will be removed in order to retain some existing canopy cover thus preventing soil erosion. Removed vegetation will be utilized to form sediment capture zones in riparian areas with high erosion potential. Planting of native riparian vegetation is expected to occur in 2018.