

### 5.2.2.1 Old Channel Restoration

The City of New Braunfels will continue to assess remaining non-native vegetation and monitor restored native habitat for all 2014 projects that are completed. Additionally, the City of New Braunfels will continue to do limited channel modifications to enhance fountain darter habitat where applicable in the remaining areas of the Old Channel downstream to Hinman Island Drive above the confluence with the New Channel of the Comal River.

### Old Channel Non-native Vegetation Removal and Maintenance

In addition to continued monitoring and maintenance (gardening) of restored native vegetation from the Sediment Island downstream to Elizabeth Street, channel restoration in 2015 will include non-native vegetation removal and subsequent native vegetation restoration, maintenance and gardening in select areas of the Old Channel between Elizabeth Street downstream approximately 2,400 feet through the Horseshoe of the Old Channel. Non-native vegetation removal and maintenance will also occur in the Spring-fed pool impoundment which conveys water from Landa Lake into the Old Channel of the Comal River.

Long-term Objective: Control non-native aquatic vegetation and establish favorable native aquatic vegetative species to the maximum extent possible.

Assumptions: Restoration of native aquatic vegetation will be accomplished in select areas of the Old Channel through the Horseshoe bend (approximately 2,400 feet downstream of Elizabeth Street) and will involve the removal of non-native aquatic vegetation, planting of native aquatic vegetation and repeated gardening and supplemental plantings of previous areas upstream. This effort will continue until the proportional native and non-native targets outlined in Table 4-6 of the HCP according to funds appropriated in Table 7.1 of the HCP.

**TABLE 4-6**  
**GOALS—FOUNTAIN DARTER HABITAT (AQUATIC VEGETATION) (m<sup>2</sup>)**

Study Reach	<i>Bryophytes</i>	<i>Hygrophila</i>	<i>Ludwigia</i>	<i>Cabomba</i>	<i>Fil. Algae</i>	<i>Sagittaria</i>	<i>Vallisneria</i>
Upper Spring Run Reach	1,850	650	150			600	
Landa Lake	4,000	250	900	500		1,250	13,500
Old Channel	150	200	1,500		300		
New Channel	150	1,350		350			
<b>TOTAL</b>	6,150	2,450	2,550	850	300	1,850	13,500

\****Bold/italics*** indicate a restoration activity that deviates from the Maximum observed.

Target 2015 /Performance Measure: Reestablishment of native aquatic vegetation and reduction of non-native aquatic vegetation in accordance with the areas defined in Table 4-6.

Methods: The target locations for *Hygrophilla* removal will be based on a review of historical vegetation mapping data to identify areas in which high value native vegetation has historically occurred and taking into consideration possible adverse affects from other mitigation actions. Two-dimensional hydraulic model results have been used in the 2013/2014 and will continue to be used in the 2015 to evaluate the potential for success of the native aquatic vegetation restoration. This evaluation will consider the depth, velocity, and substrate conditions present in the proposed areas along with what non-native vegetation is thriving in these areas. In areas bare of vegetation, the reason vegetation is absent (e.g., recent flood scour, or unsuitable depth, velocity or substrate conditions) will be evaluated prior to final selection of target areas.

Selected locations will first be sampled to remove fountain darters. Sampling will employ appropriate methods such as fanning and/or seining depending on local conditions. Non-native vegetation will then be removed and placed adjacent to the stream where qualified personnel will examine the plants for fountain darters (eggs through adults). **In applicable areas, substrate in which non-native plants are rooted may need to be removed to prevent plant re-growth from the root structure.** Fountain darter life stages will be returned to the stream. Native vegetation for plantings will consist of vegetation grown within the Landa Lake MUPPT nursery or from direct transplants within the Comal system. A variety of native vegetation (e.g., *Ludwigia*, bryophytes, and filamentous algae) will be used to meet targets outlined in Table 4-6 of the HCP.

Monitoring: Each area in which non-native vegetation has been removed will be routinely monitored for the reestablishment of non-native vegetation and effectiveness of the native vegetation planting. Once native aquatic vegetation is established in an area, monitoring will be conducted on a less frequent basis.

As noted in the HCP (Section 5.2.2.3), following natural disturbances such as floods, periods of limited recharge, and/or herbivory, as well as anthropogenic disturbances such as recreation or vandalism, the monitoring/maintenance schedule will be adjusted temporarily in order to provide stability for the native vegetation re-establishment. Monitoring will include estimated aerial coverage of native and non-native vegetation within the treated area. Any reestablished non-native vegetation will be removed during each monitoring visit and if deemed necessary, additional native vegetation will be planted. Removal of non-native vegetation will follow the same protocols as the original removal methodology. Removed vegetation will be transported to an off-site composting facility.

Allocated funds for 2015: \$ 175,000

Completion of 2014 work activities: \$50,000

Estimated Budget:\$ 225,000

**City of New Braunfels - HCP Budget**

<b>HCP Section</b>	<b>Mitigation Action</b>	<b>HCP Budget</b>	<b>Estimated FY2015</b>
5.2.2.1	Old Channel Restoration	175,000	225,000
5.2.1	Flow split management	0	5,000
5.2.2/5.2.3	Aquatic vegetation restoration	125,000	275,000
5.2.5/5.2.9	Non-native animal species control	75,000	75,000
5.2.4	Decaying vegetation removal and dissolved Oxygen Management	15,000	105,000
5.2.8	Native Riparian / Riparian improvement - riffle beetle	50,000	50,000
5.2.6/6.3.6	Gill parasite control	75,000	75,000
5.7.1	Restoration of riparian zones	100,000	430,000
5.2.7	Prohibition of hazardous material routes	0	3,000
5.7.6	Incentive program for LID/BMP stormwater management	100,000	100,000
5.7.5	Household hazardous waste program	30,000	30,000
5.2.3	Management of public recreation use	0	0
5.2.10	Litter control and floating vegetation management	0	40,000
5.2.11	Golf Course Management Plan	0	1,000
	<b>Totals</b>	<b>745,000</b>	<b>1,414,000</b>