

## **Appendix 1**

**Detailed steps and equipment needed for transect establishment, photo-point monitoring, and habitat monitoring**

### **Detailed steps for transect establishment:**

All data (e.g., GPS recordings of rebar and tree tag, length of transect, and compass bearing from rebar to end, and text directions to the rebar location) are recorded on the Transect Establishment and Environmental Description Data Form (Appendix 2).

- a) Pound in rebar (preferably a "potato digger" style, with a bent top) at the transect start; make sure it is centered correctly. Record the location of the rebar with a Global Positioning System (GPS) unit. Include the error estimation given by the GPS unit. Write text direction to the rebar location.
- b) Because rebar markers are susceptible to covering by alluvium or removal by human users of area, back-up markers are needed. Thus, tree tags, combined with the GPS recordings, are utilized to relocate the transect for future monitoring if the rebar cannot be found. Go to the nearest large cottonwood or juniper tree on higher ground, or any other suitable landmark that will most likely remain fixed for a long period of time on higher ground (e.g., fencepost) and put in an aluminum tree tag with an aluminum nail. Mark the following on the tag with a pen or pencil: SPIDIL/Occurrence #/A, B, or C. With tree tags, do not pound completely into bark—leave room for tree growth. This step is not necessary for obvious transect starting points.
- c) Record the location of the tree tag with a GPS unit (include error) and record the compass bearing (declination corrected to quad map) and distance from the tree tag to the rebar. In the text directions, write a brief description of the tagged tree or landmark. This is performed only the first year of monitoring. For second year monitoring, start at the photo-point monitoring procedure.
- d) Run the 50 m tape (which forms the center baseline) out from the rebar for the necessary length, through the center of the sub-population's habitat (parallel, not perpendicular, to the river shoreline, swale edge, or backwater channel edge).
- e) Record the length of the transect and the compass bearing (declination corrected to the quad map) of the tape from the rebar to the end.

### **Equipment needed for transect establishment:**

- 1) 50 m tape
- 2) GPS unit (navigation grade is suitable)
- 3) rebar ("potato digger" (bent top) style preferred)
- 4) aluminum tree tags and aluminum nails
- 5) compass, preferably with declination correction on dial, and a clinometer (not necessary for habitat monitoring section)
- 6) Transect Establishment and Environmental Description Data Form (at least one for each transect)

### **Detailed steps for photo-point monitoring:**

- a) Go to the half-way point of the transect. Take a series of four photos. Each photo should have a photo label (e.g., on a dry erase board placed in photo) with the date, SPIDIL/Occurrence #/A, B, or C, and an arrow (up arrow = down transect to end; right arrow = right side; down arrow = back to start; left arrow = left side). The photo order should be: 1) taken from the center of the transect toward the end, along the transect bearing; 2) taken 90 degrees from the transect bearing (right side); 3) taken 180 degrees from the transect bearing (toward the start); 4) taken 270 degrees from the transect bearing (left side).
- b) Record the roll #, frame #, photographer's name, and any identification comments in the fields located on the Transect Establishment and Environmental Description Data Form.

### **Equipment needed for photo-point monitoring:**

- 1) reliable camera (with batteries and film or memory); preferably a digital camera, but either a high quality, fully automatic, "point and shoot," or a SLR camera are acceptable, preferably with a wide angle lens (28-35 mm)
- 2) dry-erase board and black dry-erase marker for photo-point label; use paper, clipboard, and black marker as an alternative label method

**Equipment needed for habitat monitoring:**

- 1) A 2.5 m measuring stick for quickly determining sample block boundaries; preferably one that can fold-up or break down (e.g., plastic pvc or "tent-pole" style) that is marked from the bottom at 5 cm, 10 cm, and 15 cm; these markings can be used to quickly measure deposition and stubble height/utilization
- 2) *Spiranthes diluvialis* Habitat Monitoring Checklist (see Appendix 3; one for each person performing monitoring)
- 3) *Spiranthes diluvialis* Habitat Monitoring Tally Sheet (see Appendix 4; at least one for each transect)

**Detailed steps for habitat monitoring:**

- 1) The tape acts as the baseline from which 5x5 m sample blocks on each side of the tape can be placed. For example, a 25 m transect will be sampled with 10 sample blocks, 5 on each side of the tape (Figure 1). To sample the first block on the left, walk 2.5 m along the tape, lay down your reference stick perpendicular and to the left, walk 2.5 m (you are now in the center of sample block 2.5L). Follow the *Spiranthes diluvialis* Habitat Monitoring Checklist for habitat attributes measured at the transect scale (located in column 'A' on the checklist; see Appendix 3). Enter the value for attribute in the appropriate box on the *Spiranthes diluvialis* Habitat Monitoring Tally Sheet. Utilize the comments section when necessary to explain choices or provide important information. Turn around, walk 2.5 m off the right side of the tape (into the middle of sample block 2.5R) and repeat the checklist measurements. Go 5 m down the transect tape (to the 7.5 m mark) and repeat the *Spiranthes diluvialis* Habitat Monitoring Checklist on left (7.5L) and right (7.5R). Continue this process until you reach the transect end.
- 2) At the transect mid-point, measure the landscape scale attributes (located in column 'B' of the *Spiranthes diluvialis* Habitat Monitoring Checklist) and enter the value for each attribute in the appropriate box on the *Spiranthes diluvialis* Habitat Monitoring Tally Sheet.

**Appendix 2**

**Field useable copy of the "*Spiranthes diluvialis* Transect Establishment and Environmental Description Data Form"**

***Spiranthes diluvialis* Transect Establishment and Environmental Description Data Form**

Date \_\_\_\_\_ Observer(s) \_\_\_\_\_  
 Element Occurrence # \_\_\_\_\_ Element Occurrence Name \_\_\_\_\_  
 Transect A B C (circle one)

**Transect Location**

GPS coordinates of re-bar stake (UTM) \_\_\_\_\_  
 GPS WP or file name \_\_\_\_\_ GPS FOM or error (if known) \_\_\_\_\_

GPS coordinates of tree-tag or other "permanent" landmark (UTM) \_\_\_\_\_  
 GPS WP or file name \_\_\_\_\_ GPS FOM or error (if known) \_\_\_\_\_

Distance from tree-tag/landmark to re-bar \_\_\_\_\_  
 Compass bearing from tree-tag/landmark to re-bar \_\_\_\_\_

**Transect Information**

Compass bearing (declination corrected to quad map; *from* re-bar to end of transect) \_\_\_\_\_  
 Transect Length (m) \_\_\_\_\_

Directions (specific):

Sketch a map showing roads/trails, mileages, landmarks, bearings, and other details that will help relocate the transect in the future (if applicable, possible, or necessary):

**Photo-point Information**

Photo# (taken from half-way point of transect)	Roll#	Frame#	Photographer	Comments
1 (along transect)	_____	_____	_____	_____
2 (90 degrees from transect bearing)	_____	_____	_____	_____
3 (180 degrees from transect bearing)	_____	_____	_____	_____
4 (270 degrees from transect bearing)	_____	_____	_____	_____
Others (e.g., disturbances, landmarks, etc.)	_____	_____	_____	_____

See next page on back:

**Transect Establishment and Environmental Description Data Form** continued . . .

Date \_\_\_\_\_ Observer(s) \_\_\_\_\_  
Element Occurrence # \_\_\_\_\_ Transect A B C (circle one) Element Occurrence Name \_\_\_\_\_

**Environmental Features**

**PLANT COMMUNITY:** (circle up to 3 best that apply)

*Elaeagnus commutata*  
(syn. *E. commutata*/A. *stolonifera*-*Poa pratensis*)  
*Salix exigua*/mesic graminoid  
(syn. *S. exigua*/A. *stolonifera*-*Poa pratensis*)

*Agrostis stolonifera*-*Poa pratensis*  
*Carex lanuginosa*  
*Eleocharis rostellata*  
*Equisetum hyemale* and/or *E. laevigatum*  
*Equisetum variegatum*

Other (base on currently dominant species): \_\_\_\_\_

**EO DATA:** Community Description (e.g., vegetation structure, canopy cover, height, density, spatial distribution, seral status, exotic species, anomalies, etc.)

**GENERAL DESCRIPTION:** (e.g., environmental factors, water regime, adjacent vegetation, fluvial landform, erosion/deposition, fluvial age of site, etc.)

**SOIL DESCRIPTION:** (if possible; e.g., surface and A-horizon; circle appropriate descriptors and/or comment)

Organic	Loamy sand (darker color, some organic matter)
Recent Sand Deposits (1997 and after)	Cobble/pebble/sand mix (cobble dominated)
Sand	Mottled (used as a modifier for above classes)

Other/Comments (please describe): \_\_\_\_\_

**FLUVIAL LANDFORM and POSITION OF TRANSECT:** (circle one to three most descriptive)

Abandoned meander or oxbow (not linked to main channel; circle: <i>With</i> or <i>Without</i> perennial water)	Floodplain wetland
Alluvial bar (e.g., developing; not on point)	Flood overflow channel (circle: <i>With</i> or <i>Without</i> perennial water)
Backwater slough (e.g., <i>with</i> water but little or no flow except during flooding, linked to channel)	Fluvial terrace
Borrow pit/excavated ground (e.g., human caused)	Levee (circle: <i>Natural</i> or <i>Artificial</i> )
Depositional/aggrading area (e.g., recent sand?)	Point bar (e.g., developing)
Eroding cutbank	River channel bank/shore (circle: <i>Main Channel</i> or <i>Secondary Channel</i> )

Other/Comments/Size (please describe): \_\_\_\_\_

**MICROTOPOGRAPHY:** (circle one for each)

**Vertical** (perpendicular to transect): Concave Convex Flat (<3% Patterned (microrelief of hummocks and swales) Straight (= or >3%) Undulating (macro-relief)

**Horizontal** (along transect): Concave Convex Flat Patterned Straight Undulating

**ASPECT:** (degrees) \_\_\_\_\_ **SLOPE %:** (usually perpendicular to transect; if greater than 3%) \_\_\_\_\_

**% GROUND COVER:** (along transect length) Soil+ \_\_\_\_\_ Gravel+ \_\_\_\_\_ Rock/Cobble+ \_\_\_\_\_ Litter+ \_\_\_\_\_ Wood+ \_\_\_\_\_

Moss/Lichen+ \_\_\_\_\_ Basal Vegetation (usually about 10%)+ \_\_\_\_\_ Water+ \_\_\_\_\_ Other \_\_\_\_\_ = + or - 100%

**GROUND COVER DISTURBANCE:** (e.g., % of ground surface exposed along transect caused by recent fire, mechanical action, livestock, or wildlife; circle one) Zero-trace 1 to 5% 5 to 20% 20 to 40% Over 40%

**DISTURBANCE CAUSE:** \_\_\_\_\_ **ANIMAL EVIDENCE:** \_\_\_\_\_

**DISTURBANCE HISTORY:** (type, intensity, frequency, season) \_\_\_\_\_

**RIPARIAN FEATURES ADJACENT TO TRANSECT:**

**Width of Channel** (base-flow, measured at lower limits of terrestrial vegetation; circle one)

<10 m 10-25 m 25-50 m over 50 m **Bed Material in Channel** \_\_\_\_\_

**Channel Depth** (circle one) <50 cm 50-100 cm over 100 cm

**Channel Entrenchment** (height from lower limit of vegetation to mean high water) <50 cm 50-100 cm over 100 cm

**Surface H<sub>2</sub>O** (circle one) *Perennial/Present* *Seasonal-Frequent* (almost every year, recent signs) *Seasonal-Infrequent* (only

flooded during very large flow events) *Rarely, If Ever* (only flooded during extreme events, e.g., 100 year floods)

**Distance from Transect Line to H<sub>2</sub>O** (m) \_\_\_\_\_