SECTION 2:
STREAM IMPACTS

2.0   STREAM IMPACTS

For Phase I of the Northern Virginia Stream Bank all impacts shall use IF = 1.0. The system below is illustrative of a concept that is not approved for the Northern Virginia Stream Bank.

An impact to a stream or reach can be quantified and expressed in terms of Stream Condition Units (SCUs) by using the following equation:

$$Impacts\ (I) = RCI\ x\ L_I\ x\ IF \qquad Eqn\ 2.1$$

Where,

I $=$ *Impacts (in SCUs) calculated for assessment reach*

RCI $=$ *RCI of the assessment reach being impacted*

L_I $=$ *total length (in linear feet) of the Impact*

IF $=$ *Impact Factor from Table 2-1*

As depicted in Table 2-1, the more severe the impact the higher the IF. Therefore, a stream considered to have a SEVERE impact has the highest IF of 1.0 and is appropriate when the impact to the stream is complete over the entire impact length. Conversely, a stream with negligible or no impacts (NONE/NEGLIGIBLE in Table 2-1) has an IF of 0 (representing no mitigation required).

To determine the total proposed impacts (in SCUs), the RCI value for the assessment reach (as determined in Section 1.0 of this Manual) is multiplied by the proposed impact length and the appropriate IF from Table 2-1. The resulting value is the total quantity of <u>impacted</u> SCUs for that single impact area. This methodology not only takes into consideration the severity of the impact, but also factors in the existing assessed value of the stream. For example, a SEVERE impact to a degraded stream will not require as much mitigation as a SEVERE impact to a high quality stream.

Form 2-1, <u>Stream Impact Assessment Worksheet</u>, is provided on page 86 for documenting all the information necessary to calculate the proposed stream impacts at each impact area. The stream impacts calculated for each impact area are then tallied up to calculate the total stream impacts (I_T) , in units of SCUs, for the entire site. The total stream impacts are recorded at the bottom of Form 2-1 and are equal to the total stream mitigation required (I_T) for the site. Note that the Drainage Area data recorded on Form 2-1 will be used in Section 3.0 to compute the provided mitigation credits.

TABLE 2-1: IMPACT FACTORS (IF)

For Phase I of the Northern Virginia Stream Bank all impacts shall use IF = 1.0. The system below is illustrative of a concept that is not approved for the Northern Virginia Stream Bank.

SEVERE *Non-countersunk culvert or piped system.* *Concrete, riprap or gabion-lined stream bed* *Bottomless culvert with scour protection in stream bed and/or banks* *Filled, relocated or re-aligned stream*	***1.0***
SIGNIFICANT *Countersunk culverts or piped system.* *Non-countersunk culvert or piped system causing permanent impacts to Waters of the U.S., with additional floodplain culverts, with capacity equal to floodplain conveyance.*	***0.75***
MODERATE *Bridge with piers, multiple Con/Span or multiple bottomless culverts causing permanent impacts to the Waters of the U.S.* *Riprap or gabion-lined banks, one or both, with <u>no</u> impact to Waters of the U.S.* *Countersunk culvert with additional floodplain culverts with capacity equal to floodplain conveyance*	***0.50***
MINOR *Bridge, Con/Span or Bottomless Culvert causing only temporary (no permanent) impacts to Waters of the U.S.*	***0.25***
NONE / NEGLIGIBLE *Bridge, Con/Span or bottomless culvert that does not permanently or temporarily impact Waters of the U.S.* *Bridge, Con/Span or bottomless culvert that only requires temporary impacts during construction <u>and</u> provides floodplain culverts with capacity equal to floodplain conveyance.*	***0***

FORM 2-1: IMPACT ASSESSMENT WORKSHEET

Project # : _____ Date: _____

Team : _____

Impact #	Drainage Area DA (A) (acres)	RCI (A)	Impact Factor IF (B)	Length L_I (C) (feet)	Impacts I $I = A * B * C$ (SCUs)
TOTAL IMPACTS (I_T) [1] =					

[1] Total Impacts (I_T) = Total Required Mitigation Credits.

2.1.1 SEVERE IMPACTS, IF = 1.0

SEVERE - Concrete lined channel causing permanent disturbance to Waters of the U.S.

SEVERE - Piped (culverted stream)

SEVERE - Straightened and channelized stream

SEVERE IMPACTS, IF = 1.0 (cont)

SEVERE - Box culvert impacting stream bed
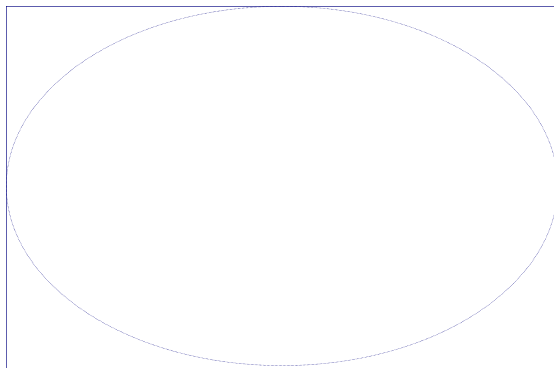
SEVERE - Bottomless culvert with scour protection

SEVERE - Twin-CMP Arch culverts with concrete bottom

2.1.2   SIGNIFICANT IMPACTS, IF = 0.75

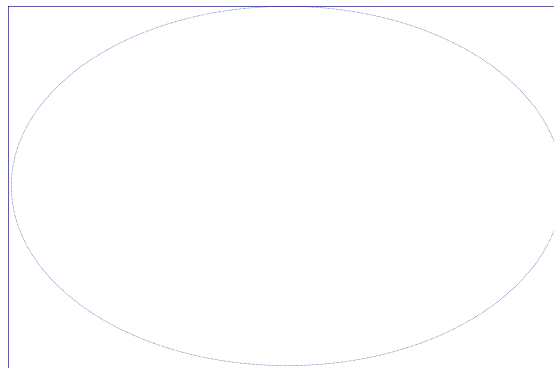SIGNIFICANT - Countersunk culvert
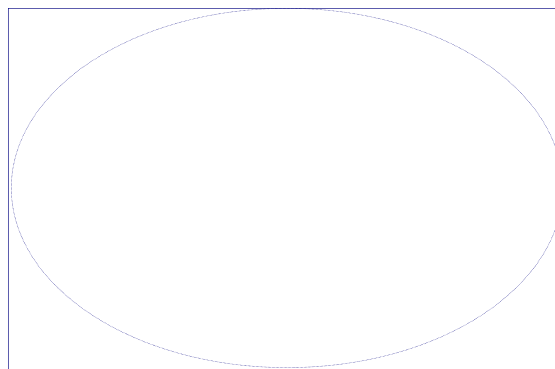

SIGNIFICANT - Countersunk culvert

2.1.3   MODERATE IMPACTS, IF = 0.50

MODERATE - Bridge with multiple piers causing permanent impacts to Waters of the U.S.

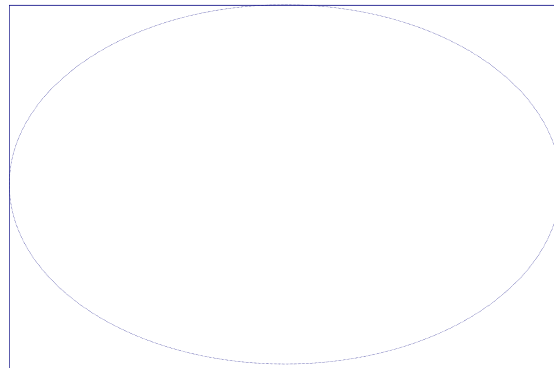MODERATE - Riprap-lined bank causing permanent impact to Waters of the U.S. only on banks.

MODERATE - Countersunk culvert with flanking culverts providing floodplain conveyance.

2.1.4   MINOR IMPACTS, IF = 0.25

MINOR– Con/Span causing only temporary impacts to Waters of the U.S.

MINOR– Con/Span causing only temporary impacts to Waters of the U.S.

2.1.5   NEGLIGIBLE / NONE, IF = 0

NEGLIGIBLE - Pedestrian Bridge spanning the floodplain of a Northern Virginia stream one (1) month after the completion of a stream restoration project.

NEGLIGIBLE - Con/Span or Bottomless culvert with flanking culverts for floodplain conveyance. Only temporary impacts to Waters of the U.S. during construction.

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