

# Aquatic Organism Passage

## Virginia Conservation Practice Job Sheet

396



### Definition

Modification or removal of barriers that restrict or impede movement of aquatic organisms.

### Criteria

Evaluate sites for variations in stage and discharge, tidal influence, hydraulics, geomorphic impacts, sediment transport and continuity, and organic debris movement. Design passage features to account for the known range of variation resulting from this evaluation.

Mitigate undesirable channel plan or profile shifts resulting from the modification or removal of a passage barrier.

Plan and locate passage for compatibility with local site conditions and stream geomorphology, to the extent possible.

Avoid locating fishway entrances and exits in areas that will obstruct function, increase harassment or predation, or result in excessive operation and maintenance requirements.

### Design Requirements

Design computations must be performed by a qualified individual

Design passage to accommodate present and reasonably anticipated changes in watershed conditions.

Design passage structures according to known swimming and leaping capabilities of target species or a similar species with comparable swimming abilities. Utilize hydraulic computations to document how designs satisfy the physiological requirements of target organisms.

Design passage structures to mimic channel geometry and morphology referenced from an adjacent reach or analog stream when the swimming and leaping abilities of target species are unknown, or when a project will benefit multiple aquatic organisms.

At a minimum, design and evaluate passage structures for hydraulic performance and structural integrity at the bankfull and 25-year peak flow events.

Design passage features to minimize or avoid energy deficits, physical stress, and harm to migratory organisms.

Design passage features to minimize or avoid excessive delays during migration periods.

Provide adequate attraction flow into a passage facility across the full range of discharge during which target species will move.

Design culvert crossings in accordance with Virginia Conservation Practice Standard *Stream Crossing (Code 578)*.

Use trashracks on culverts or fishways only if required or necessary. Ensure that trashracks are self-cleaning and/or easily maintained.

Select construction materials that are non-toxic and resistant to degradation.

Plan construction logistics, methods, and sequencing to minimize adverse effects to aquatic organisms, riparian areas, and instream habitat.



**1A. EXISTING CULVERT** (Fill out information for the first culvert, print out page, clear data and fill information out for second culvert. Repeat if necessary.)

<b>Number:</b> <input type="checkbox"/> 1.1 <input type="checkbox"/> 2.3 <input type="checkbox"/> 1.2 <input type="checkbox"/> 2.4 <input type="checkbox"/> 1.3 <input type="checkbox"/> 3.3 <input type="checkbox"/> 1.4 <input type="checkbox"/> 3.4 <input type="checkbox"/> 2.2 <input type="checkbox"/> 4.4	<b>Shape:</b> <input type="checkbox"/> ARCH <input type="checkbox"/> BOX <input type="checkbox"/> ELL <input type="checkbox"/> RND <input type="checkbox"/> SQSH <input type="checkbox"/> Other	<b>Culvert material:</b>  	<b>Span:</b> _____	<b>Length:</b> _____
			<b>Rise:</b> _____	
			<b>Outfall:</b> _____	<b>% Slope:</b> _____
<b>Bed Material:</b> <input type="checkbox"/> Bedrock <input type="checkbox"/> Boulders <input type="checkbox"/> Cobble <input type="checkbox"/> Gravel <input type="checkbox"/> Sand <input type="checkbox"/> Silt <input type="checkbox"/> Clay <input type="checkbox"/> Other	<b>Apron:</b> <input type="checkbox"/> At Outlet <input type="checkbox"/> None <input type="checkbox"/> At Inlet <input type="checkbox"/> Both <input type="checkbox"/> Ends	<b>Fill Depth:</b> _____	<b>Damaged:</b> <input type="checkbox"/> Collapsed <input type="checkbox"/> Drop at Inlet <input type="checkbox"/> Gradient Change <input type="checkbox"/> Multiple Materials <input type="checkbox"/> Not Damaged <input type="checkbox"/> Obstruction <input type="checkbox"/> Rebar Showing <input type="checkbox"/> Rusted Through <input type="checkbox"/> Unknown	
		<b>Tidegate:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No		
		<b>Water Velocity:</b> _____ Ft/Sec _____ M/Sec		
		<b>Downstream Gradient:</b> _____ (%)		<b>Upstream Gradient</b> _____ (%)
<b>Average Bankful Width:</b> _____	<b>Angle of stream to inlet culvert (degrees) from centerline</b> _____	<b>Angle of stream to outlet of culvert (degrees)</b> _____		

**1B. CULVERT SOLUTION**

<input type="checkbox"/> Complete removal, no replacement with another structure				
<b>Replaced with:</b> <input type="checkbox"/> Bridge <input type="checkbox"/> Complete Removal	<b>Replaced with:</b> <input type="checkbox"/> No Slope Culvert <input type="checkbox"/> Hydraulic Design Culvert <input type="checkbox"/> Stream Simulation Culvert	<b>Shape:</b> <input type="checkbox"/> ARCH <input type="checkbox"/> BOX <input type="checkbox"/> ELL <input type="checkbox"/> RND <input type="checkbox"/> SQSH <input type="checkbox"/> Other _____	<b>Culvert Material:</b>  	
_____ Span	_____ Rise	_____ Length	_____ % Slope	<b>Embedded Depth:</b> _____ Inlet _____ Outlet
<b>Downstream Bed Controls:</b> Log # _____ Rock # _____	<b>Upstream Bed Controls:</b> Log # _____ Rock # _____	<input type="checkbox"/> Retrofitted In Place	<b>Baffles Installed – Type:</b> Angled # _____ Corner # _____ Notched # _____	<b>Weirs Installed:</b> Concrete # _____ Metal # _____ Wood # _____

Notes:

**2A. EXISTING DAM (WEIR)**

Height: _____	Face: <input type="checkbox"/> Vertical <input type="checkbox"/> Ogee <input type="checkbox"/> Sloped	Base: <input type="checkbox"/> Concrete Apron <input type="checkbox"/> Natural Bed <input type="checkbox"/> Riprap Apron <input type="checkbox"/> Other _____	Plunge Pool Depth: _____
Construction/Form: <input type="checkbox"/> Temporary "Push-Up" Berm <input type="checkbox"/> Concrete (w/Stoplogs) <input type="checkbox"/> Concrete (Solid) <input type="checkbox"/> Metal (w/Stoplogs) <input type="checkbox"/> Wood (or Log) <input type="checkbox"/> Large Rock <input type="checkbox"/> Other _____		Reservoir Depth: _____	

**2B. DAM SOLUTION**

<input type="checkbox"/> Roughened Channel w/Rocks	<input type="checkbox"/> Bypass Channel	# of Weirs/Bed Controls: _____
<input type="checkbox"/> Roughened Channel w/Logs	<input type="checkbox"/> Denil Fishway	
<input type="checkbox"/> Complete Removal	<input type="checkbox"/> Other: _____	
<input type="checkbox"/> Pool and Weir Fishway		

**3A. EXISTING BRIDGE**

Material: <input type="checkbox"/> Log Stringer <input type="checkbox"/> Steel <input type="checkbox"/> Wood <input type="checkbox"/> Other: _____	Footings: <input type="checkbox"/> Concrete <input type="checkbox"/> Wood <input type="checkbox"/> Earthen <input type="checkbox"/> Other: _____	Distance from Bridge Bottom to OHW : _____	Length: _____
			Width: _____

**3B. BRIDGE SOLUTION**

<input type="checkbox"/> Complete removal, no replacement with another structure.		Replaced with: <input type="checkbox"/> Bridge <input type="checkbox"/> Culvert <input type="checkbox"/> Ford	
Replaced with: <input type="checkbox"/> No-slope Culvert <input type="checkbox"/> Stream Simulation Culvert <input type="checkbox"/> Hydraulic Design Culvert	Shape: <input type="checkbox"/> Arch <input type="checkbox"/> Box <input type="checkbox"/> ELL <input type="checkbox"/> RND <input type="checkbox"/> SQSH <input type="checkbox"/> Other: _____	Material:	Span: _____
			Rise: _____
			Length: _____
Downstream Bed Controls: Log # _____ Rock # _____	Upstream Bed Controls: Log # _____ Rock # _____	<input type="checkbox"/> Retrofitted in Place	

Notes:



**Operation and Maintenance Requirements are located in a separate document (396-VA-O&M Plan) and must be included with the job sheet in the case file.**

**Planner Certification**

This Aquatic Organism Passage design meets the requirements of NRCS Conservation Practice Standard 396.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**Certification of Practice Completion**

This Aquatic Organism Passage practice has been completed and maintained according to NRCS plans and specifications. (Indicate if there were any changes to the planned practice and acreage.)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date