Bill as Introduced

2011 SESSION

11-0541
06/09

HOUSE BILL ***621-FN-LOCAL***

AN ACT relative to the authority of the department of transportation.

SPONSORS: Rep. Hill, Merr 6; Rep. Jennifer Coffey, Merr 6; Rep. Kreis, Merr 6; Rep. Chandler, Carr 1; Rep. T. Keane, Merr 13; Rep. Foose, Merr 1; Sen. Bradley, Dist 3

COMMITTEE: Public Works and Highways

ANALYSIS

This bill provides for an excavation and dredging permit by notification for municipalities that construct and maintain structures in accordance with Best Management Practices for Routine Roadway Maintenance.

Explanation: Matter added to current law appears in ***bold italics.***
Matter removed from current law appears [~~in brackets and struckthrough.~~]
Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.

11-0541
06/09

STATE OF NEW HAMPSHIRE

In the Year of Our Lord Two Thousand Eleven

AN ACT relative to the authority of the department of transportation.

Be it Enacted by the Senate and House of Representatives in General Court convened:

1 Excavating and Dredging Permit; Certain Exemptions. Amend RSA 482-A:3, I-a to read as follows:

I-a. ***Notwithstanding any law or rule to the contrary,*** in reviewing requests proposed, sponsored, or administered by the department of transportation, there shall be a rebuttable presumption that there is a public need for the requested project, and that the department of transportation has exercised appropriate engineering judgment in the project's design.

2 Filing Fees. Amend RSA 482-A:3, III to read as follows:

III. The filing fees collected pursuant to paragraphs I, V(c), XI(h), [~~and~~] XII(c), ***and XVI(c)*** and RSA 483-B:5-b are continually appropriated to and shall be expended by the department for paying per diem and expenses of the public members of the council, hiring additional staff, reviewing applications and activities relative to the wetlands of the state and protected shorelands under RSA 483-B, conducting field investigations, and holding public hearings. [~~Such fees shall be held by the treasurer in a nonlapsing fund identified as the wetlands and shorelands review fund.~~]

3 Filing Fees; Version Effective July 1, 2011. Amend RSA 482-A:3, III to read as follows:

III. The filing fees collected pursuant to paragraphs I, V(c), XI(h), [~~and~~] XII(c), ***and XVI(c)*** are continually appropriated to and shall be expended by the department for paying per diem and expenses of the public members of the council, hiring additional staff, reviewing applications and activities relative to the wetlands of the state and protected shorelands under RSA 483-B, conducting field investigations, and holding public hearings. [~~Such fees shall be held by the treasurer in a nonlapsing fund identified as the wetlands and shorelands review fund.~~]

4 New Paragraph; Municipalities; Permit by Notification. Amend RSA 482-A:3 by inserting after paragraph XV the following new paragraphs:

XVI.(a) Any person or political subdivision that constructs, replaces, or maintains structures in accordance with the Best Management Practices for Routine Roadway Maintenance in New Hampshire published by the department of transportation, if applicable, and has filed an appropriate notice under subparagraph (b), to construct, replace, or maintain such structures with the department and the department of transportation shall have satisfied the permitting requirements of this section for minimum impact activities, as defined by rules adopted by the commissioner.

(b) Appropriate notice to the department and the department of transportation shall include the following information:

(1) Name and address of the person or political subdivision constructing, replacing, or maintaining the structure.

(2) Any identifying information regarding the structure.

(3) A copy of the appropriate United States Geological Survey topographic map with the type and location of all wetland and waterbody crossings clearly indicated.

XVII. The installation of a culvert or bridge and associated fill to permit vehicular access to property for a single family building lot shall be permitted under this chapter, providing that the project meets criteria for a minimum impact activity as defined in rules adopted by the commissioner, and notification is sent to the department.

5 Permit Required; Exemption. Amend RSA 483-B:5-b, I(b) to read as follows:

(b) The permit application fee shall be $100 plus $.10 per square foot of area affected by the proposed activities and shall be deposited in ***a non-lapsing fund identified as*** the wetlands and shorelands review fund [~~established under RSA 482-A:3, III~~]. Such fees shall be capped as follows:

6 Application of Funds. Amend RSA 6:12, I(b)(131) to read as follows:

(131) Moneys deposited in the wetlands and shorelands review fund under RSA [~~482-A:3, III~~] ***483-B:5-b, I(b)***.

7 Effective Date.

I. Section 3 of this act shall take effect July 1, 2011 at 12:01 a.m..

II. The remainder of this act shall take effect upon its passage.

LBAO
11-0541
01/18/11

HB 621-FN-LOCAL - FISCAL NOTE

AN ACT relative to the authority of the department of transportation.

FISCAL IMPACT:

Due to time constraints, the Office of Legislative Budget Assistant is unable to provide a fiscal note for this bill at this time. When completed, the fiscal note will be forwarded to the House Clerk's Office.

LBAO
11-0541
Revised 02/04/11

HB 621 FISCAL NOTE

AN ACT relative to the authority of the department of transportation.

FISCAL IMPACT:

The Department of Environmental Services states this bill will have an indeterminable impact on state revenue and expenditures. The Department of Transportation states this bill may increase state highway fund expenditures by an indeterminable amount in FY 2012 and each year thereafter. The New Hampshire Municipal Association states this bill may decrease local expenditures by an indeterminable amount in FY 2012 and each year thereafter.

METHODOLOGY:

The Department of Environmental Services states this bill modifies an existing non-lapsing dedicated fund, the wetlands and shoreland review fund, by narrowing its purpose by no longer depositing wetland fees in the fund and having only fees associated with the shoreland review program deposited in the fund. The Department states the wetlands fees would still be collected and appropriated for the wetlands program, but any remaining funds would now lapse to the general fund at the end of each fiscal year. The Department states the revenue stream associated with the wetlands fees varies annually with economic conditions and seasonally with the construction cycle and it is usually greatest during the first and fourth quarters of the fiscal year with a drop-off in the second and third quarters. As a result, the Department cannot predict the fiscal impact of the bill

The Department of Transportation (DOT) states this bill's requirement for a political subdivision to submit notifications to the Department and to the Department of Environmental Services whenever the political subdivision constructs, replaces, or maintains certain structures related to projects involving filling and dredging in wetlands. The Department states it has not received such notifications in the past and cannot predict how many it could expect to receive or any cost increase associated with it.

The New Hampshire Municipal Association states the bill provides for an excavation and dredging permit by notification for a municipality that constructs and maintains certain structures. The Association states replacing the current permitting requirement with this bill's notification requirement would reduce local expenditures by eliminating the permit fee and some of the costs associated with filling out the permit forms, however it cannot estimate the

number of projects that would be affected or the amount by which local expenditures could be reduced.

Amendments

Rep. Hill, Merr. 6
January 31, 2011
2011-0130h
06/03

Amendment to HB 621-FN-LOCAL

Amend RSA 482-A:3, III as inserted by section 2 of the bill by replacing it with the following:

III. The filing fees collected pursuant to paragraphs I, V(c), XI(h), and XII(c) and RSA 483-B:5-b are continually appropriated to and shall be expended by the department for paying per diem and expenses of the public members of the council, hiring additional staff, reviewing applications and activities relative to the wetlands of the state and protected shorelands under RSA 483-B, conducting field investigations, and holding public hearings. [~~Such fees shall be held by the treasurer in a nonlapsing fund identified as the wetlands and shorelands review fund.~~]

Amend RSA 482-A:3, III as inserted by section 3 of the bill by replacing it with the following:

III. The filing fees collected pursuant to paragraphs I, V(c), XI(h), and XII(c) are continually appropriated to and shall be expended by the department for paying per diem and expenses of the public members of the council, hiring additional staff, reviewing applications and activities relative to the wetlands of the state and protected shorelands under RSA 483-B, conducting field investigations, and holding public hearings. [~~Such fees shall be held by the treasurer in a nonlapsing fund identified as the wetlands and shorelands review fund.~~]

Amend the bill by replacing section 5 with the following:

5 Permit Required; Fees. Amend the introductory paragraph of RSA 483-B:5-b, I(b) to read as follows:

(b) The permit application fee shall be $100 plus $.10 per square foot of area affected by the proposed activities and shall be [~~deposited in the wetlands and shorelands review fund established under RSA 482-A:3, III. Such fees shall be~~] capped as follows:

Amend the bill by inserting after section 6 the following and renumbering the original section 7 to read as 8:

7 Repeal. RSA 6:12, I(b)(131), relative to the wetlands and shorelands review fund, is repealed.

Rep. Hill, Merr. 6
January 31, 2011
2011-0130h
06/03

Amendment to HB 621-FN-LOCAL

Amend RSA 482-A:3, III as inserted by section 2 of the bill by replacing it with the following:

III. The filing fees collected pursuant to paragraphs I, V(c), XI(h), and XII(c) and RSA 483-B:5-b are continually appropriated to and shall be expended by the department for paying per diem and expenses of the public members of the council, hiring additional staff, reviewing applications and activities relative to the wetlands of the state and protected shorelands under RSA 483-B, conducting field investigations, and holding public hearings. [~~Such fees shall be held by the treasurer in a nonlapsing fund identified as the wetlands and shorelands review fund.~~]

Amend RSA 482-A:3, III as inserted by section 3 of the bill by replacing it with the following:

III. The filing fees collected pursuant to paragraphs I, V(c), XI(h), and XII(c) are continually appropriated to and shall be expended by the department for paying per diem and expenses of the public members of the council, hiring additional staff, reviewing applications and activities relative to the wetlands of the state and protected shorelands under RSA 483-B, conducting field investigations, and holding public hearings. [~~Such fees shall be held by the treasurer in a nonlapsing fund identified as the wetlands and shorelands review fund.~~]

Amend the bill by replacing section 5 with the following:

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(b) The permit application fee shall be $100 plus $.10 per square foot of area affected by the proposed activities and shall be [~~deposited in the wetlands and shorelands review fund established under RSA 482-A:3, III. Such fees shall be~~] capped as follows:

Amend the bill by inserting after section 6 the following and renumbering the original section 7 to read as 8:

7 Repeal. RSA 6:12, I(b)(131), relative to the wetlands and shorelands review fund, is repealed.

Speakers

10:00 AM.

SIGN UP SHEET

To Register Opinion If Not Speaking

Bill # HB621-FN-Local Date February 24, 2011

Committee Public Works and Highways

** Please Print All Information **

Name	Address	Phone	Representing	(check one) Pro	Con
Chris Albert	PO Box 110 Concord	- 944-0111	NH Assoc. of Natural Resour. Scientist.		X
Nathan Hadaway	28 charles st Concord	753-2191	Town of Bow DPW	X	
Tom Keane	Rep Merrimack 15			X	

Hearing Minutes

HOUSE COMMITTEE ON PUBLIC WORKS AND HIGHWAYS

PUBLIC HEARING ON HB 621-FN-L

BILL TITLE: relative to the authority of the department of transportation.

DATE: February 24, 2011

LOB ROOM: 201 **Time Public Hearing Called to Order:** 10:08 a.m.

Time Adjourned: 11:30 a.m.

(please circle if present)

Committee Members: Reps. G. Chandler, Seidel, E. Smith, Graham, Gibnet, McConkey, Tilton, Waterhouse, Kolodziej, Buxton, Maltz, M. Smith, Terrio, Bouchard, Campbell, Long, Sprague and Ramsey.

Bill Sponsors: Rep. Hill, Merr 6; Rep. Jennifer Coffey, Merr 6; Rep. Kreis, Merr 6; Rep. Chandler, Carr 1; Rep. T. Keane, Merr 13; Rep. Foose, Merr 1; Sen. Bradley, Dist 3

TESTIMONY

* Use asterisk if written testimony and/or amendments are submitted.

***Rep. Hill - Introduced and spoke in favor of HB 621.**

Mr. Christopher Albert from NH Association of Natural Resources Scientists - Stated that he is opposed to HB 621 and feels rule making did an appropriate job when creating these rules.

Mr. Stephen Bluhm - Spoke in favor of HB 621. As a Selectman from the Town of Northfield, he sees these rules as an unfunded mandate. The new DES regulation turned a $12,000 culvert replacement into an $80,000 project that is more expensive than the town can afford. All they wanted to do is replace a drainage culvert that was old and rusting and this legislation would allow that to be done.

Mr. Rene Pellitier from DES - Spoke in opposition to HB 621. Two years of effort from interested parties helped draft these new DES rules. Stream rules were designed to pay attention to the volume of water passing through the culverts. Older culvert designs were not well thought out and thirty year old culverts will not handle the amount of water that comes with Fifty year storms. He testified that the Town of Northfield should have been given by permit by notification.

The Army Corp of Engineers would have to permit a culvert if the State does not use the GEICAS rules and changed to the DOT permit. NH DES mirrors the Army Corp of Engineers and is allowed to be the permitting agency. Towns are being invited to attend training meetings. DES welcomes pre-application meetings.

Mr. Richard Roach from the US Army Corp of Engineers - Spoke in opposition to HB 621. It is to the detriment of the environment to use DOTS best management practices. The DOT is not able to protect the environment especially aquatic animal crossing.

The Army Corp is not staffed to take on the function of the DES if rule making is taken from DES and given to DOT.

*Mr. Gary Abbott from the Associated General Contractors - Spoke in support of HB 621.

Mr. Bill Cass from NH DOT - Understands the permit of notification process works well for routine maintenance.

The State programmatic Grant program permits should not be undermined so that DES can work in place of the USACE.

Mr. Paul Sanders from the NH Municipal Association - Spoke in favor of HB 621. RSA 234 regarding bridges allows for DOT aid and it is the intent of HB 621 to include both DOT and DES. The simplified process will reduce cost while still protecting the environment.

Respectfully Submitted:

Kevin Waterhouse

Rep. Kevin K. Waterhouse, Clerk

HOUSE COMMITTEE ON PUBLIC WORKS AND HIGHWAYS

PUBLIC HEARING ON HB 621-FN-L

BILL TITLE: relative to the authority of the department of transportation.

DATE: 2/24/11

LOB ROOM: 201 **Time Public Hearing Called to Order:** 10:08

Time Adjourned: 11:30

(please circle if present)

Committee Members: Reps. G. Chandler, Seidel, E. Smith, Graham, Cloutet, McConkey, Tilton, Waterhouse, Kolodziej, Buxton, Maltz, M. Smith, Terrio, Bouchard, Campbell, Long, Sprague and Ramsey.

Bill Sponsors: Rep. Hill, Merr 6; Rep. Jennifer Coffey, Merr 6; Rep. Kreis, Merr 6; Rep. Chandler, Carr 1; Rep. T. Keane, Merr 13; Rep. Foose, Merr 1; Sen. Bradley, Dist 3

TESTIMONY

* Use asterisk if written testimony and/or amendments are submitted.

* Rep. Hill introduced and spoke in favor of HB 621.

Mr Christopher Albert from NH Assoc of Natural Resources Scientists stated that he is opposed to HB 621 and feels rule making did an appropriate job when creating these rules.

Mr. Stephen Bluhm spoke in favor of HB621. As a selectman from the Town of Northfield he sees these rules are an unfunded mandate. The new DES regulation turned a $12000 culvert replacement into an $80,000 project that is more expensive than the town can afford. All they wanted to do is replace a drainage culvert that was old and rusting this legislation would allow work to be done.

Ms. Rene Pelletier from DES spoke in opposition to HB621. Two years of effort from interested parties helped draft these new DES rules.

Stream rules were designed to pay attention to the volume of water passing through the culvert.

The increase of impervious structures are putting more run off water into the drainage culverts.

Older culvert designs were not well thought out and Thirty year old culverts will not handle the amount of water that comes with fifty year storms.

He testified that the Town of Northfield should have been given by permit by Notification.

The Army Corp of engineers would have to permit a culvert if the State does not use the GEICAR rules and changed to the DOT permit. NH DES MISSON the Army Corp of Engineers and is allowed to be the permitting agency. Towns are being invited to attend training meetings. DES welcomes pre application meetings.

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The CORE is not staffed to take on the function of the DES if rule making is taken from DES and given to DOT.

* Mr. Gary Abbott from the Associated General Contractors spoke in support of HB621.

Mr. Bill Cass from NHDOT under the permit of Notification process works well for routine maintenance

The State programatic Grant program permit should not be undermined so that DES can work in place of the USACE.

Mr. Paul Sanderson from the NH Municipale Association spoke in favor of HB621. RSA 234 regarding bridges allows for DOT aid and it is the intent of HB621 to include BOTH DOT & DES. The simplified process will reduce cost while still protecting the environment.

Testimony

To the members of the Committee of Public Works and Highways:

Thank you for giving me this opportunity to speak to you today in favor of house bill 621.

In recent years New Hampshire municipalities have seen an explosion in the number of unfunded mandates they are subjected to by the State. Increasingly the State chooses to circumvent the legislative process when imposing these mandates, depriving local taxpayers of any ability to debate their impact on our communities.

Northfield was recently the victim of one of these mandates. Last year we discovered that one of our culverts was in need of replacement. There had been no failure of the culvert itself, it is merely old and has started to rust. A local contractor informed us that the cost of replacing this structure would be about $12,000. We were ready to start the work when we learned that new regulations imposed by the Department of Environmental Services would potentially forbid us from replacing this structure with anything except an open bottom concrete structure. Our $12,000 project had suddenly ballooned into a project estimated to cost $80,000. The engineering costs alone are estimated to cost more than the entire cost of simply replacing the culvert. This additional regulation was enacted by DES without legislative oversight, and the cost is borne entirely by our town's property tax payers. Please keep in mind that all we want to do is replace a culvert that has started to rust out. In its long life it has never proved to be substandard. The existing structure has always worked as intended – it just needs to be replaced.

While HB 621 will not entirely solve our problem it will go a long way toward a resolution. The legislation will allow municipalities acting in accordance with Best Management Practices to construct, replace or maintain structures without having to resort to costly and arbitrary upgrades imposed by the State. I urge you to vote in favor of this legislation.

Thank you for your consideration.

Rep. Rep. Hill

The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Thomas S. Burack, Commissioner

February 24, 2011

The Honorable Gene Chandler, Chairman
Public Works and Highways Committee
Legislative Office Building, Room 201
Concord, New Hampshire 03301

Re: HB 621, relative to the authority of the Department of Transportation

Dear Chairman Chandler:

Thank you for the opportunity to comment on HB 621, which would provide for an excavation and dredging permit by notification for applicants proposing to construct and maintain structures in jurisdictional streams and wetlands. The Department of Environmental Services (DES) strongly opposes this bill.

HB 621 would result in a much less stringent state wetlands permitting process for stream crossing structures, such as culverts and bridges, than under the federal permitting process that now exists in New Hampshire and that is implemented by the United States Army Corps of Engineers for federally-regulated wetlands. As a result, the benefits for permit applicants of the Army Corps of Engineers State Programmatic General Permit (SPGP) would likely be invalidated for most projects. The SPGP is a permit issued by the US Army Corps of Engineers to the State of New Hampshire to enable streamlined permitting processes. Under the SPGP, DES performs reviews for most projects with wetlands impacts of less than three acres, and then issues permits that cover both the state and federal requirements. In order for the SPGP to be in effect, DES regulations and state statutes need to be as stringent as federal requirements, which is now the case. If the state program were to become less stringent, individual permit applications to the Corps of Engineers would be required for all proposed impacts in federally-regulated wetlands where a state permit would be less stringent. Individual permits from the Army Corps of Engineers typically require at least 6 to 9 months as compared to less than 60 days for wetlands permits from DES for major projects with complete applications and cost considerably more to obtain than state-issued permits. Therefore, this would result in both substantial delays for applicants to receive wetlands permits as well as substantial additional costs. Specific concerns with the bill are described below.

Section 4 of HB 621 would insert a new paragraph, RSA 482-A:3,XVI, into RSA 482-A, Fill and Dredge of Wetlands, to make all new stream crossing projects, as well as replacement and maintenance projects for existing structures, eligible for permit by notification. The proposed paragraph would define all of these projects as "minimum impact activities" irrespective of project size, owner or whether the impact is new or for maintenance. Existing DES administrative rules establish a permit by notification process for routine roadway and railway maintenance activities, and this process has worked well for maintenance of culverts and other similar work performed by properly trained personnel. However, new construction and replacement projects that are not replacement in kind require a wetlands permit, with the exact requirements based on the nature and size of the project. This would create a conflict with the SPGP requirements. HB 621 would also

allow any person or political subdivision to perform maintenance activities, rather than trained personnel as specified in the rules. In addition, the information required as proposed by RSA 482-A XVI (b) is much less than under current administrative rules and notification to the local governing body is not required. Please also note that Section 3 of the bill references a paragraph XVI(c), which does not appear in Section 4.

The proposed new paragraph, RSA 482-A, XVII, in Section 4 would authorize the installation of culverts or bridges for single family building lots through a notification process based on a notification that would contain only the name of the applicant, type of structure, and location of the structure identified on a USGS map. Under the proposed language, a permit by notification would be required to be approved by DES without regard for the size of the structure, the nature of the crossing, the location relative to property lines or size of the stream that would be crossed. This proposed language would also be in conflict with the SPGP.

Sections 2, 3, 5 and 6 would result in a substantial modification to the wetlands and shorelands review fund, the existing non-lapsing fund that helps support the wetlands program. Wetlands permit application filing fees would still be appropriated to, and expended by, the DES. However, at the end of the fiscal year, the account would lapse and any remaining funds would be turned over to the general fund. The revenue stream from wetlands permit application fees has historically been highly variable both annually due to the state of the economy and seasonally with the construction cycle in New Hampshire. As a result, both annual and monthly revenues are unpredictable. Without the buffer provided by the existing dedicated non-lapsing fund, downward adjustments in staffing, beyond those that have already occurred temporarily in the current recession economy, would be required over time. This would also likely cause DES to not be able to fulfill its responsibilities under the SPGP or to timely process applications.

In conclusion, HB 621 would put in jeopardy the existing Army Corps of Engineers SPGP for New Hampshire which currently operates well in conjunction with the existing state wetlands program. This benefit should not be put at risk by a change in the permitting process that makes New Hampshire's program less stringent for certain projects in a way that would cause unnecessary delays and costs to wetlands permit applicants. Therefore, we strongly oppose HB 621 and ask that it be found inexpedient to legislate.

Thank you for this opportunity to comment. Please call Collis Adams at 271-4054, or me at 271-2958, if you have any questions or need additional information.

Very truly yours,

Michael D. Nolin, Asst. Comm.
for Thomas S. Burack

cc: Representatives Hill, Coffey, Kreis, Chandler, Keane and Foose
Senator Bradley

Pelletier, Rene

To: gsmith@northfieldnh.org

Greg: Hope this will help with your proposed culvert replacement project.

The crossing that has been described should meet one of two minimum impact project types (could file an expedited application) or one overlapping Permit by Notification project (PBN form) as listed below. If there is a turtle issue it would have to be a listed species and have to be found in the wetland/stream for DES to elevate the project type. If not required per rule, DES as a cooperative partner with NHFG will typically request that the applicant resolve any concerns directly with NHFG.

The following are some questions we need to help address this issue and some that we often ask when dealing with replacement culvert projects if there is a concern it may not be a minimum impact project.

1. Who did the engineer or Town talk to at DES? Who and when did they talk to DES?
2. Was it a detailed pre-application meeting with DES or just general questions for the IOD or regional inspector discussing possible permitting scenarios without specific site data?
3. Are there any related DES files?
4. If they have determined there is a protected animal species/NHB issue who did they contact at NH Fish and Game? What was the response/requirements?
5. What is the resource area (perennial stream, intermittent stream and/or wetlands)?
6. What size is the existing culvert?
7. Is it an in-kind replacement (specifically, length and diameter)?
8. Is there a history of flooding? (may be consideration if Tier 2 stream)
9. Watershed size? This information may be needed to determine stream Tier for project and application type. If they don't know we would direct to stream stats (free USGS tool) from our website. We will often run ourselves if a town or homeowner.
10. Determine if any special circumstances/issues besides a 640 acre watershed size that would make it a Tier 3, such as prime wetlands, protected species/NHB or habitat. The complete list is in Env-Wt 904.04(a).
11. If no NHB or other special circumstances/issues it should be a $200.00 Permit By Notification or a Minimum Impact Expedited application to replace an existing culvert. The following bolded rules would be the determining factor.

If for some reason this specific situation does not comply with noted rules it would *not* be a minimum impact project or PBN. However, there are other rules such as the underlined below, Env-Wt 904.07(a) that would allow for in-kind replacement as a Tier 1 or Tier 2 with very easy standards to meet (could be done using a few site observations and knowledge of the crossing history) In a worst case scenario we have worked with applicants to come up with a practicable design under Env-Wt 904.09 Alternative Designs.

Expedited or PBN:

Env-Wt 303.04 Minimum Impact Projects.

Env-Wt 303.04(x) Maintenance, repair, or replacement of a nondocking structure such as a culvert, headwall,

bridge, dam, residential utility line, or rip-rap slope of less than 50 linear feet, provided:

(1) No change in location, configuration, construction type, or dimensions is proposed;

(2) Any stream crossing work qualifies as minimum impact under ***Env-Wt 903.01(e)(2) or (3);*** and

(3) The applicant certifies in writing that the structure, in its current location, configuration, construction type and dimensions:

a. Was previously permitted by the department and has not been abandoned; or

b. Would be considered grandfathered under Env-Wt 101.43 and has not been abandoned;

PBN Rule that refers to Env-Wt 303.04(X):

Env-Wt 506.01 Projects Qualifying for Permit by Notification.

(a) The following projects shall qualify for the permit by notification process:

(7) The maintenance, repair, or replacement of a nondocking structure that meets the criteria in Env-Wt 303.04(x).

Expedited:

Env-Wt 303.04 Minimum Impact Projects.

(j) Any project not otherwise specified in this section that is located within the right-of-way of a public highway, provided the project:

(1) Does not impact bogs, marshes, sand dunes, tidal wetlands, or undisturbed tidal buffer zone;

(2) Is not in or within 100 feet of prime wetlands, unless a waiver has been granted pursuant to RSA 482-A:11, IV(b);

(3) Does not meet the criteria of Env-Wt 303.02(k);

(4) Includes only:

a. Drainage structures that do not exceed 3,000 square feet of dredge or fill in area; and

b. Stream crossings that qualify as minimum impact under ***Env-Wt 903.01(e)***; and

(5) Meets the following criteria:

a. Swamps or wet meadows crossed shall have no standing water for 10 months of the year;

b. Fill for any single crossing shall not exceed 50 feet in length, measured along the roadway;

c. The fill width, measured at the base of the roadway side slopes, shall be minimized, and shall not exceed 50 feet; and

d. Shoulder widening shall not exceed 3 cubic yards of fill per linear foot in wetlands that have no standing water for 10 months of the year, and shall not exceed 10 feet of additional encroachment measured from base of slope;

Referenced Stream Rules:

Env-Wt 903.01 Classification of Stream Crossings and Stream Crossing Projects.

(e) A project shall be classified as a minimum impact project if (f) and (g), below, do not apply, and the only stream crossing included in the project is:

(1) A new tier one stream crossing that meets the criteria of Env-Wt 904.02(b);

(2) A repair or rehabilitation that is classified as a minimum impact project under Env-Wt 904.06(c); or

(3) A replacement that is classified as a minimum impact project under Env-Wt 904.07(c).

(f) A project shall be classified as a minor impact project if (g), below, does not apply, and:

(1) The only stream crossing included in the project is:

a. A new tier one stream crossing for which approval of an alternative design is being sought as specified in Env-Wt 904.02(c);

b. A new tier 2 stream crossing that meets the criteria of Env-Wt 904.03(b);

c. A replacement tier 2 stream crossing that does not meet the criteria of Env-Wt 904.06;

d. A repair or rehabilitation that is classified as a minor impact project under Env-Wt 904.06(d); or

e. A replacement that is classified as a minor project under Env-Wt 904.07(d); or

(2) Any of the criteria for a minor impact project specified in Env-Wt 303.03 are met.

(g) A project shall be classified as a major impact project if:

(1) The stream crossing is a new or replacement tier 3 crossing; or

(2) Any of the criteria for a major project specified in Env-Wt 303.02 are met, regardless of the tier classification of the stream crossing that is part of the project.

Env-Wt 904.06 Repair or Rehabilitation of Tier One or Tier 2 Existing Legal Stream Crossings.

(a) An existing legal crossing that would be classified as tier one under Env-Wt 904.02(a) or as tier 2 under Env-Wt 904.03(a) shall be repaired or rehabilitated pursuant to this section only if the crossing does not have a history of causing or contributing to flooding that damages the crossing or other human infrastructure.

(b) Repair or rehabilitation of a culvert or other closed-bottom stream crossing structure pursuant to this section may be accomplished by concrete repair, slip lining, cured-in-place lining, or concrete invert lining, or any combination thereof, except that slip lining shall not occur more than once.

(c) An existing legal crossing that would be classified as tier one under Env-Wt 904.02(a) or as tier

2 under Env-Wt 904.03(a) shall be repaired or rehabilitated as a minimum impact project only if the stream

crossing as proposed to be repaired or rehabilitated will:

(1) Meet the general criteria specified in Env-Wt 904.01;

(2) Not diminish the hydraulic capacity of the crossing; and

(3) Not diminish the capacity of the crossing to accommodate aquatic life passage.

(d) If the criteria of (c), above, cannot be met, an existing legal crossing that would be classified as tier one under Env-Wt 904.02(a) or as tier 2 under Env-Wt 904.03(a) shall be repaired or rehabilitated as a minor impact project if the stream crossing as proposed to be repaired or rehabilitated will:

(1) Not adversely impact the stability of the stream banks or stream bed upstream or downstream of the crossing; and

(2) Not cause an increase in the frequency of flooding or overtopping of banks.

Env-Wt 904.07 In-Kind Replacement of Tier One or Tier 2 Existing Legal Stream Crossings.

(a) If the routine roadway/railway maintenance exemption of Env-Wt 303.05(q) is not available, an existing legal crossing that would be classified as tier one under Env-Wt 904.02(a) or as tier 2 under Env-Wt 904.03(a) may be replaced pursuant to this section, provided that the existing crossing does not have a history of causing or contributing to flooding that damages the crossing or other human infrastructure.

(b) The replacement stream crossing shall be:

(1) The same size and type as the existing stream crossing; or

(2) An upgrade of the existing stream crossing, for example by replacing a closed-bottom culvert that did not have stream simulation with a span, or with a pipe arch or culvert with stream simulation.

(c) An existing legal crossing that would be classified as tier one under Env-Wt 904.02(a) or as

tier

2 under Env-Wt 904.03(a) shall be replaced as a minimum impact project only if the stream crossing as

proposed to be replaced will:

(1) Meet the general criteria specified in Env-Wt 904.01;

(2) Not diminish the hydraulic capacity of the crossing; and

(3) Not diminish the capacity of the crossing to accommodate aquatic life passage.

(d) If the criteria of (c), above, cannot be met, an existing legal crossing that would be classified as tier one under Env-Wt 904.02(a) or as tier 2 under Env-Wt 904.03(a) shall be replaced as a minor impact

project if the stream crossing as proposed to be replaced will:

(1) Not adversely impact the stability of the stream banks or stream bed upstream or

downstream of the crossing; and

(2) Not cause an increase in the frequency of flooding or overtopping of banks.

Env-Wt 904.01 General Design Considerations. All stream crossings shall be designed and constructed so as to:

(a) Not be a barrier to sediment transport;

(b) Prevent the restriction of high flows and maintain existing low flows;

(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction;

(d) Not cause an increase in the frequency of flooding or overtopping of banks;

(e) Preserve watercourse connectivity where it currently exists;

(f) Restore watercourse connectivity where:

(1) Connectivity previously was disrupted as a result of human activity(ies); and

(2) Restoration of connectivity will benefit aquatic life upstream or downstream of the

crossing, or both;

(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and

(h) Not cause water quality degradation.

Env-Wt 904.09 Alternative Designs.

(a) If the applicant believes that installing the structure specified in the applicable rule is not ***practicable,*** as that term is defined in Env-Wt 101.69, the applicant may propose an alternative design in accordance with this section.

Env-Wt 101.69 "Practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

New Hampshire Department of Environmental Services

DES's Mission Statement

To help sustain a high quality of life for all citizens by protecting and restoring the environment and public health in New Hampshire.

DES's Guiding Principles

- We promote mutual respect and effective, straightforward communication.
- We provide timely and consistent responses to all customers.
- We provide meaningful opportunities for public participation in meeting our responsibilities.
- We consider quality of life, public health and safety, economic vitality, and the concerns of our citizens while pursuing our responsibilities under the law.
- We strive for excellence in all of DES's operations, are committed to continuous improvement, and consider innovative approaches.
- We are committed to scientifically and technically sound, cost-effective and environmentally appropriate solutions.
- We provide leadership on environmental and sustainability issues.
- We consider the long-term, cumulative, and cross-media effects of our policies, programs and decisions.
- We foster environmental awareness and stewardship through education, outreach and assistance.
- We afford fair and equitable treatment of all individuals and groups in the implementation of federal and state environmental laws, rules, programs and policies, and in the management of the agency.
- We maintain a work environment that attracts and retains the most dedicated and talented staff.

The Associated General Contractors of New Hampshire, Inc.

48 Grandview Road ▼ Bow, New Hampshire 03304
603/225-2701 ▼ Fax 603/226-3859

DES Proposed Stream Crossing Rules

Presented to the House Public Works & Highways Committee
April 1, 2010

I would like to state that the Associated General Contractors of New Hampshire (AGC of NH) has taken considerable time reviewing and discussing the proposed rules. The rule changes are long and not easy to follow, however, after having a discussion with our Board of Directors last week, it became necessary for the Association to comment on this issue.

These proposed rules place requirements on stream crossings that will result in significantly higher costs. State, local municipalities, developers, and residents will be required on all culverts that cross intermittent streams, or have a drainage watershed area of 25 acres or more to have an engineering analysis performed. This means that in cases where a drainage area only has occasional flow, a technical analysis will need to be done by a professional. The typical cost of an analysis is $5,000 or greater depending on the size of the site.

This cost would be in addition to the installation of an open box culvert the proposed rules require. An open box culvert costs much more than the traditional round or box culvert because of the added expense of digging down further, placing a footing, and requiring more man hours. Contractors have informed me that installing an open box culvert will cost 6 times more than what it costs to install a round or box culvert. In addition to the monetary costs, there is the potential to dramatically slow the economic recovery of the private sector.

The rules require the installation of an open box culvert to mitigate impacts to the aquatic life in the streams. However, the Association questions whether the environmental cost benefit justifies these changes. Does the environmental benefit significantly outweigh the thousands of dollars that will be spent on every stream crossing; even when there is the potential that significant aquatic life may not reside there?

The Association believes that mandating every stream crossing be subject to these rules is unreasonable; this includes the exemption process. It would be better to offer more prescriptive rules that detail when an engineering analysis or open box culvert is needed. The Association hopes the House Public Works and Highways Committee will continue to work with DES to revise rules so that they will not impact the economy in such a large way, and become more practical, whether being applied to public or private projects.

Respectfully Submitted,

Gary A Abbott
Executive Vice President

Stream Crossing

- State, local municipalities, developers, and residents will be required on all culverts that cross intermittent streams or have a drainage watershed area of 25 acres or more to now have an engineering analysis.

- This means some drainage areas that have occasional flow that you could step over will need a technical analysis done by a professional.

- The cost of the analysis is in the range of $5,000-$8,000 depending on complexity.

- The rule mandates the best system be installed unless the applicant can show it is unnecessary which in turn means an analysis must be done in each case.

- Currently without these rules, a culvert replacement or installation wouldn't need the analysis and most likely cost less than an engineering analysis for round or box culvert.

- The new rules require open box which cost substantially more due to the higher installation costs of digging down further ant the man hours necessary to install. An $8,000 culvert replacement that now takes place will cost about $8,000 for the analysis and about $35,000 for the installation of an open box culvert.

HJ621

NEW HAMPSHIRE
Local Government Center

March 4, 2010

Scott F. Eaton
Office of Legislative Services
Administrative Rules
25 Capitol Street Rm 219
Concord, NH 03301

Re: Notice No. 2009-108 and 109

Proposed Env-Wt Rules, Various Sections, #2009-108
Proposed Env-Wt Rules, Adoption of New Env-Wt 900, #2009-109
Stream Crossings
Final Proposal Comments

Dear Director Eaton,

Please find enclosed the comments of the Local Government Center to the above captioned Final Proposal for filing with the Joint Legislative Committee on Administrative Rules, and to be considered at the hearing on March 5, 2010.

Sincerely,

Paul G. Sanderson

Paul G. Sanderson
Staff Attorney

NH Municipal Association Fax: 603.224.5406 | Workers' Compensation Trust Fax: 603.226.2322 | Property-Liability Trust Fax: 603.226.2322 | HealthTrust Fax: 603.226.2988

PO Box 617 • Concord, NH 03302-0617 • Tel. 603.224.7447 • NH Toll Free 800.852.3358 • E-mail: info@nhlgc.org • Web site: www.nhlgc.org

STATE OF NEW HAMPSHIRE
JOINT LEGISLATIVE COMMITTEE ON ADMINISTRATIVE RULES

Re: Notice No. 2009-108 and 109

Proposed Env-Wt Rules, Various Sections, #2009-108
Proposed Env-Wt Rules, Adoption of New Env-Wt 900, #2009-109
Stream Crossings
Final Proposal Comments

COMMENTS OF LOCAL GOVERNMENT CENTER

The Local Government Center is a stakeholder in the consideration of these rules because all of our member municipalities are required by RSA 231:3 to construct, reconstruct, and maintain Class V highways within their respective jurisdictions. As part of that effort, there are numerous instances where the road crosses a stream brought under the jurisdiction of the rules described in these two rulemaking proceedings. During the process leading up to the filing of the Final Proposal, Local Government Center has actively participated in the public comment process. While many of our concerns have been addressed by the Department, there are concerns which remain.

1. JLCAR Staff Comments, #2009-108, Env-Wt, Various Sections.

We have received and reviewed JLCAR staff comments in this proceeding, with which we generally concur, except as follows:

A. Amend Env-Wt 303.03, new paragraph (n), and Env-Wt 303.04(j)

Staff comments that the term "public ownership interest of a public road" is unclear. We concur. There are only four methods to create a public highway in New Hampshire, which are as specified in RSA 229:1. It is possible to have the land where the road exists conveyed to a municipality or the state in fee, which would result in a public ownership of the land. However, a highway may also be created by the methods of layout, dedication and acceptance, and prescription. In each of these cases, the existence of the highway does not require public ownership of the land in fee. Therefore, use of the word "ownership" is not accurate. We suggest that the sections instead read,

"(n) Any project located within the *right of way of a public highway* that meets..."

And that proposed Env-Wt 303.04(j) read

"(j) Any project located within the *right of way of a public highway,* provided..."

B. Comments relative to the FIS and Part 1, Article 28-a Statements.

The municipalities concur generally in concern expressed in the staff comments, but firmly believe that there will be an immediate increase in required local expenditures if these rules are adopted. The precise fiscal impacts are indeterminate, and will vary depending upon the type and scope of stream crossing project which is proposed. We will reserve our more detailed comments to the related proceeding 2009-109, Proposed Env-Wt 900, since the impacts are more readily apparent in that text.

2. JLCAR Staff Comments, #2009-109, Env-Wt 900 Stream Crossings.

We concur generally with the comments made by staff in this proceeding, with these additional comments.

A. With the adoption of the "tiered" approach to evaluation of crossings, proposed rules Env-Wt 904.03 and 904.04 require plans to be stamped by a NH licensed professional engineer before submission to DES. This is a new requirement for municipalities in the administration of their road maintenance program under RSA 231:3. Pursuant to RSA 541-A:25, if the department wishes to impose this requirement, it should be funded by the state, and the FIS and Part 1, Article 28-a statement are inaccurate if they state that this requirement does not violate these provisions, as well as RSA 541-A:25.

B. "Compensatory mitigation" is apparently required for any project, regardless of tier, that does not meet all of the requirements of these new rules. It is unclear how an applicant would know how to access other rules of the department that discuss this concept, and unclear how these principles would be applied to municipalities. If a municipality is somehow required to compensate for the loss of a wetland in order to effectively design and install a stream crossing, such compensation might range from protection of other lands as wetlands to the payment of money. The placement of restrictions upon municipally owned land cannot always be accomplished by governing bodies. If the land is managed by the conservation commission, for example, that body would have a say in the change in use. If public funds were required to be paid for mitigation purposes, it may well require an appropriation by the legislative body of the municipality. All of these authorities take time and public meetings to procure, and are not certain prior to successful votes of necessary boards or the legislative body.

Any required "compensatory mitigation" might involve the expenditure of public funds by the municipality in order to comply with an order of the Department of Environmental Services. This raises concerns under the FIS, the Part 1 Article 28-a statement, and under RSA 541-A:25. Any required "compensatory mitigation" should be funded by the State, since municipalities do not have the option of refusing to maintain a Class V road under RSA 231:3. If a highway is not safe for passage, it must either be repaired or closed.

C. Env-Wt 904.07 Alternate designs.

LCAR staff did not comment on this section of the rule. The municipalities are concerned because the standard set forth in 904.07 (b) (1) for the approval of alternate designs appears to differ from the standards set forth in RSA 482-A:1, 3, and 11 and Rule Env-Wt 101.69, which

defines "Practicable" as meaning "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes."

In the proposed rule, deviation from the normal standards requires that the cost be "grossly disproportionate" to the overall cost of the project. We are unable to ascertain the authority to adopt this standard under either the authorizing statutes, other approved rules of the department, or guidance from the Army Corps of Engineers. We do not understand exactly what would make a cost "grossly disproportionate", and believe that it raises the possibility of subjective decision making. While cost is certainly a consideration in determining whether a project is "practicable", there appears to be no legal authority or policy reason for raising the standard to "grossly disproportionate".

For all of the above reasons, we respectfully request the JLCAR to enter a preliminary objection to the adoption of these rules in both rulemaking proceedings.

Respectfully submitted,

Paul G. Sanderson

Dated: March 4, 2010

Paul G. Sanderson, Esq. #2248
Staff Attorney
Local Government Center
25 Triangle Park Drive
Concord, NH 03302

MASSACHUSETTS stream crossings HANDBOOK

MASSACHUSETTS RIVERWAYS PROGRAM

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS • DEPARTMENT OF FISH AND GAME

ACKNOWLEDGEMENTS

The Massachusetts Riverways Program, a division of the Department of Fish and Game, promotes the restoration, protection, and ecological integrity of the Commonwealth's rivers, streams, and adjacent lands.

This Stream Crossing Handbook is designed to inform local decision makers and advocates about the importance of properly designed and maintained culverts and bridges for fish and wildlife passage. The guidelines presented in this handbook are intended as a supplement, and not as a replacement, to sound engineering design of culverts and bridges. These guidelines describe minimum goals for fish and wildlife passage; additional design considerations are needed to ensure structural stability and effective passage of flood waters.

River Continuity is aimed at reducing impediments to movement of fish, wildlife and other aquatic life that require instream passage. The River Continuity Partnership is a collaborative effort with the Riverways Program, the University of Massachusetts Extension, The Nature Conservancy, and other nonprofit and agency partners. The Stream Crossing Standards presented in this booklet were developed by the River Continuity Partnership with contributions from state agencies, local and regional nonprofits, and private consultants. The standards were adopted by the Army Corps of Engineers in the Massachusetts Programmatic General Permit in January 2005.

Special thanks to the partners who helped edit and review this booklet, including local highway personnel, conservation commissioners, nonprofit and state agency personnel. Special thanks to those who contributed photographs for this publication. All artwork copyright by Ethan Nedeau (www.biodrawversity.com) and cannot be reproduced without permission. For more information on Stream Continuity, please see www.streamcontinuity.org

Editors: Amy Singler and Brian Graber, Massachusetts Riverways Program

Writing and design: biodrawversity (www.biodrawversity.com)

June 2005

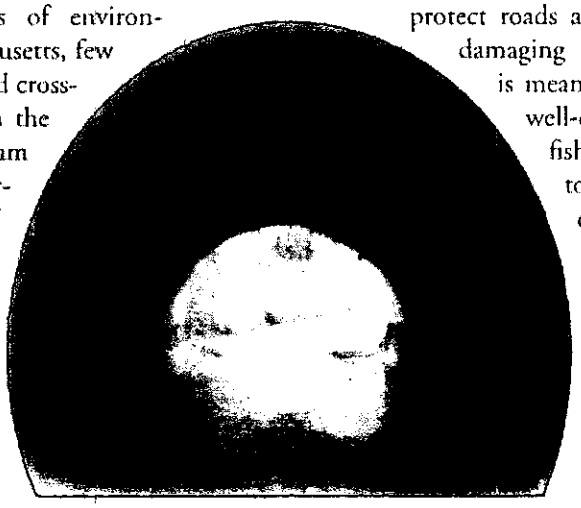
RIVERWAYS PROGRAM

Ethan Nedeau photo

INTRODUCTION

Massachusetts' citizens have traditionally been very proud—and protective—of their streams and rivers, recognizing the many benefits of healthy ecosystems. They conduct stream cleanups, set aside conservation land to protect streams, and celebrate the return of anadromous fish each spring. People value streams for different reasons: some enjoy fishing for native trout, others enjoy kayaking, and others simply enjoy sitting quietly on a stream bank. No matter what the reasons, resource managers in Massachusetts are proud to work in a state that demonstrates broad support for stream protection and restoration.

Although public awareness of environmental issues is high in Massachusetts, few people consider the effects of road crossings and other infrastructure on the quality of stream habitat. Stream conditions may be quite different upstream and downstream of a road crossing, and a crossing may look different during low or high water. The design and condition of a stream crossing determine whether a stream behaves naturally and whether animals can migrate along the stream corridor.

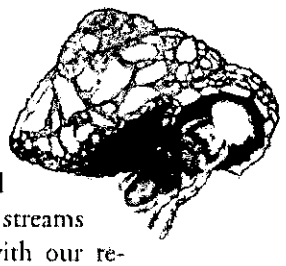


Ethan Nedeau photo

Stream continuity has not often been considered in the design and construction of stream crossings (culverts and bridges). Many crossings are barriers to fish and wildlife. Even crossings that were not barriers when originally constructed may now be barriers because of stream erosion, mechanical breakdown of the crossings, or changes in the upstream or downstream channel shape.

Fortunately, we have learned how to design stream crossings that allow wildlife unrestricted access to a watershed, maintain natural stream conditions, and help protect roads and property from some of the damaging effects of floods. This booklet is meant to communicate the basis for well-designed stream crossings for fish and wildlife and allow people to evaluate existing crossings to decide whether they should be replaced. Town conservation commissions, highway departments, town engineers, and the public should use this booklet to help protect and restore stream continuity throughout Massachusetts.

Stream Continuity and Natural Communities

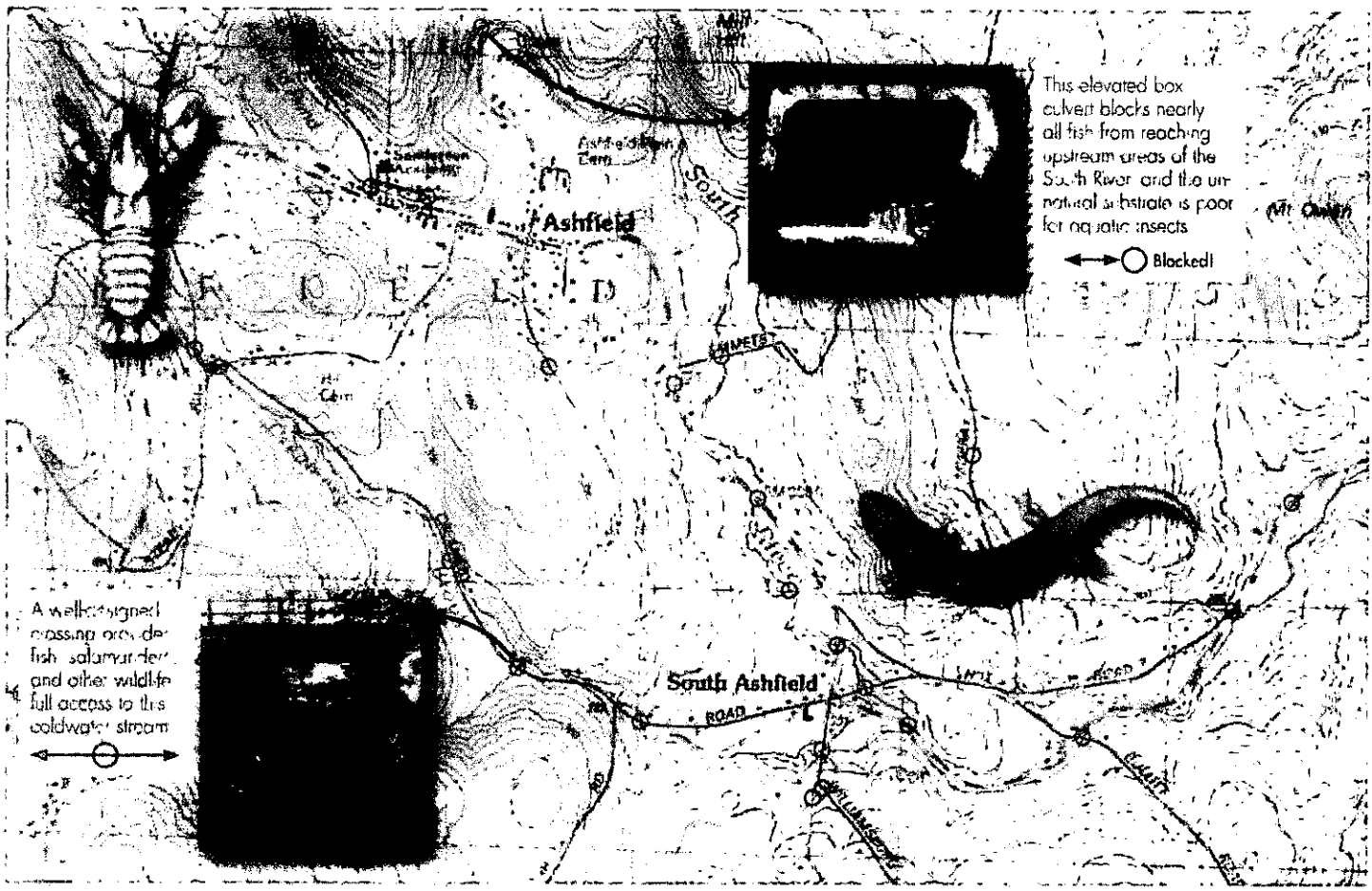


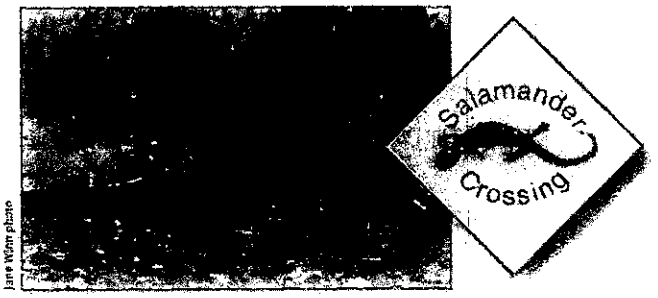
snail-case caddisfly

Many species inhabit streams and adjacent forests and wetlands. Effective stream protection requires that we consider the needs of all species including invertebrates such as crayfish and insects, fish such as brook trout and eels, amphibians such as spring salamanders, reptiles such as wood turtles, and mammals such as muskrats and otters. Streams—and the interconnectedness of different parts of a stream or watershed—are essential to these animals. Many riparian animals, such as amphibians and reptiles, are more tolerant of stream discontinuity yet may be affected by road crossings, especially if forced to cross roads where they are vulnerable to traffic and other dangers. For reasons as simple as escaping random disaster or as complex as maintaining genetic diversity, animals living in or along streams need to be able to move unimpeded through the watershed.

Consider the roads you regularly drive to complete your day-to-day tasks. What if the roads you drive on were suddenly permanently blocked so that you could not get to important places? This may sound absurd to us, but this is analogous to what we have done to species that inhabit streams throughout Massachusetts. Through the combined effects of dams and poorly designed bridges and culverts, we have partitioned streams and forced wildlife to cope with our restrictions. Here are a few examples to consider:

- **Access to coldwater habitats:** Small streams with groundwater seeps and springs provide coldwater refuge during the summer. Species such as brook trout will travel to these areas and congregate there. Fish that can't make it there—perhaps because of barriers we created—may be more susceptible to heat stress and mortality. If barriers restrict the size of a refuge, then animals may be overcrowded and vulnerable to disease, predators, and even anglers.
- **Access to feeding areas:** Different habitats provide different feeding opportunities throughout a day or season, and species regularly travel to exploit these resources. Striped bass and sea-run trout swim up tidal





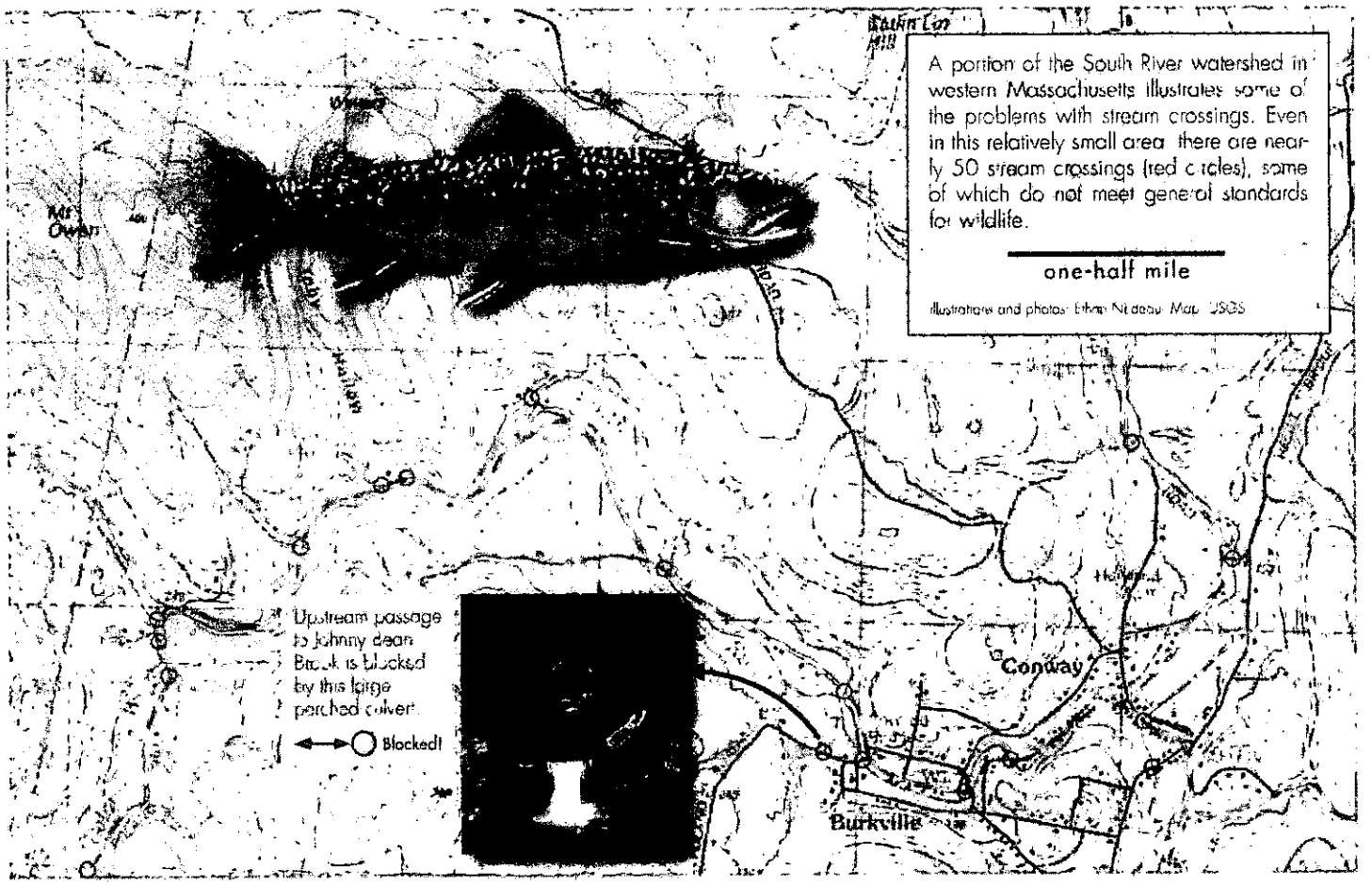
Jane Winn photo

Turtles, salamanders, and other wildlife often must cross roads. Well-designed stream crossings will give them a safer route. This wood turtle can't climb the curb.

creeks to feed during high tide. Insect communities in small ponds and riparian wetlands can be abundant at times, and stream fish will move into these habitats to feed. Restricting access to prime feeding areas will ultimately hurt the fishery.

- **Access to breeding and spawning areas:** Some species need to travel miles to reach spawning areas in streams. The best examples are anadromous species that live in the ocean but spawn in freshwater, such as Atlantic salmon, alewife, shad, lamprey eels, and sea-run trout. Fish may encounter many barriers when adults travel to spawning areas, offspring disperse into juvenile and eventually adult habitat, and juvenile anadromous species swim to the ocean.
- **Natural dispersal:** Some salamanders, turtles and frogs spend most of their lives near streams and travel in and along a stream's length. Poorly designed crossings may force them to climb over an embankment and cross a road, where they are vulnerable to road mortality and predators. Freshwater mussels disperse by having larvae that attach to the fins of a fish, so if a stream crossing blocks fish then it may also prevent upstream dispersal of mussels. If a stream is damaged by a catastrophic event (such as pollution, flooding, or severe drought), then natural dispersal will return the stream to a healthy productive environment.

In addition to effects on wildlife movement, many stream crossings degrade nearby habitat, making conditions inhospitable for some native plants and animals. The effects can be even greater in tidal creeks. By limiting tidal flow, restrictions alter water levels and chemistry, diminish sources of ocean nutrients, and can degrade entire upstream aquatic systems.



Recognizing Problems

Three stream crossing problems—undersized crossings, shallow crossings, and crossings that are perched—can be barriers to fish and wildlife and lead to several common consequences. Recognizing poor stream crossings and their consequences is an important step in evaluating whether crossings should be fixed or replaced.

Right: In Washington state, a chum salmon crosses the road because the stream crossing was blocked by floodwaters
Harley Soltes/The Seattle Times

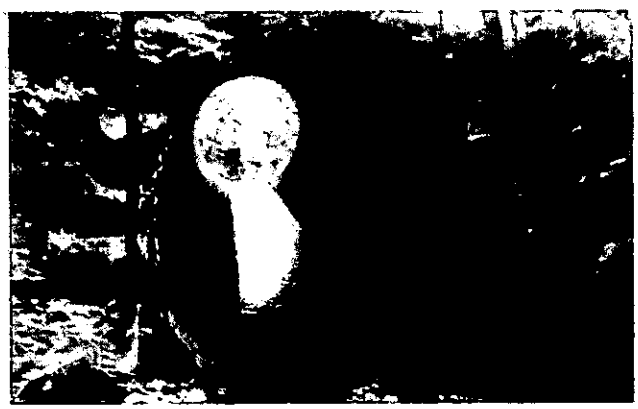
STREAM CROSSING PROBLEMS

UNDERSIZED CROSSINGS

Undersized crossings restrict natural stream flow, particularly during floods, causing several problems, including scouring and erosion, high flow velocity, clogging and ponding. Crossings should be large enough to pass fish, wildlife and floods.

SHALLOW CROSSINGS

Shallow crossings have water depths too low for many organisms to move through them and may lack appropriate bed material. Crossings should have an open bottom or should be sunk into the streambed to allow for substrate and water depths that are similar to the surrounding stream.



PERCHED CROSSINGS

Perched crossings are above the level of the stream bottom at the downstream end. Perching can result from either improper installation or from years of downstream bed erosion. Crossings should be open-bottomed or sunk in the bed to prevent perching.

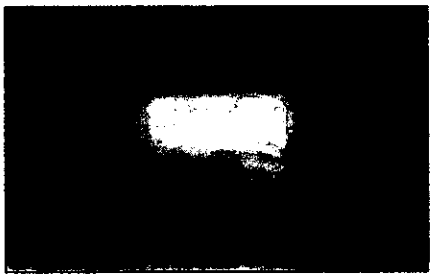
COMMON CONSEQUENCES OF POOR STREAM CROSSINGS

Scott Jackson photo

Low Flow

Low flow is a problem for species movement within the stream. Fish and other aquatic organisms need to have sufficient water depths to move through a stream crossing. Low velocities may lead to stagnant conditions within the crossing.

Causes: shallow crossings, perched crossings



Ethan Nedeau photo

Unnatural Bed Materials

Metal and concrete are not appropriate materials for species that travel along the streambed. The substrate (rocks and other material on the bed of the crossing) should match the natural substrate of the surrounding stream in order to maintain natural conditions and not disrupt the stream continuity.

Causes: shallow crossings, perched crossings

Riverways photo

Scouring and Erosion

In undersized crossings, high water velocities may scour natural substrates in and downstream of the crossing, degrading habitat for fish and other wildlife. High water velocities and related flow alterations may also erode streambanks. Scour pools often develop downstream of perched culverts and may undercut the culvert.

Causes: undersized crossings, perched crossings

Unknown photo

High Flow

Water velocity is higher in a constricted crossing than it is upstream or downstream. This high flow degrades wildlife habitat and weakens the structural integrity of crossings. During floods, undersized crossings may be filled with fast-moving water. Many of the problems with poorly designed crossings are heightened during floods.

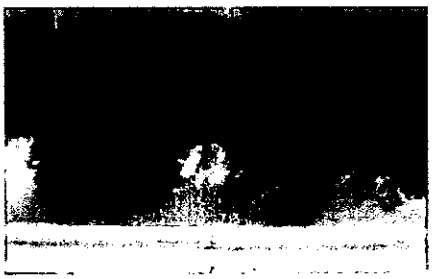
Cause: undersized crossings

Scott Jackson photo

Clogging

Some crossings—especially undersized ones—can become clogged by woody debris, leaves, and other material. This may exacerbate the impact of floods and make a crossing impassable to wildlife. Costly, routine maintenance may be required to prevent this problem.

Cause: undersized crossings



Ethan Nedeau photo

Ponding

Ponding is the backup of water upstream of an undersized crossing. It may occur year-round, during seasonal high water or floods, or when they become clogged. Ponding can lead to property damage, road and bank erosion, and severe changes in upstream habitat. It may also create new wetlands that may not be desirable.

Causes: undersized crossings, perched crossings

Scott Jackson photo

Crossing Guidelines

Safe and stable stream crossings can accommodate wildlife and protect stream health while reducing expensive erosion and structural damage. One goal of this booklet is to provide real, easily attainable solutions. Regulations for Massachusetts now require that all new crossings adhere to the stream crossing guidelines presented in this booklet (Army Corps of Engineers Massachusetts Programmatic General Permit, January 2005). We also encourage towns to evaluate existing crossings and consider replacing or retrofitting them.

Crossings should be essentially "invisible" to fish and wildlife—they should maintain appropriate flow and substrate through the crossing and not constrict a stream. At the same time, designs should be efficient and cost-effective. The standards are required for new permanent crossings (e.g., roads, railways, bike paths) on fish-bearing streams and rivers, and must be used as guidelines for upgrading existing crossings. They are applicable but not required in streams that dry out seasonally. Standards are not intended for temporary crossings such as temporary logging roads, or for drainage systems designed to convey storm water or wastewater.

Site constraints may make it difficult to follow these standards. Shallow bedrock can make it impractical to embed culverts, and the road layout and surrounding landscape may make it impossible to attain the recommended standards for height and openness. In those situations, a site assessment will be necessary to determine how to achieve fish and wildlife passage. Site-specific information and good professional judgment should always be used to develop practical and effective crossing designs.

Regulations for Massachusetts now require that all new crossings adhere to the General Standards presented in this booklet.

All crossings should be designed according to one of two sets of standards: General and Optimum. The two standards balance the cost and logistics of crossing designs with the degree of stream protection warranted in sensitive habitats. Local highway departments and construction professionals have considerable creativity, expertise, and local knowledge that will enable them to design effective crossings. Conservation commissioners have a good understanding of the natural resources in their towns and the level of protection that may be required in certain areas. Thus, standards are written in a way to allow for flexibility.

Stream Crossing Standards

General standards provide for fish passage, stream continuity, and some wildlife passage. All permanent crossings must meet general standards.

Optimum standards provide for fish passage, stream continuity, and wildlife passage. Optimum standards should be used in areas of statewide or regional significance for their contribution to landscape connectedness or in streams that provide critical habitat for rare or endangered species.

STREAM CROSSING STANDARDS

Stream crossing standards are based on six important variables (see page 8 for common measurements). While the specifics of the regulations listed below may change over time, the crossing guidelines presented throughout this handbook remain effective for fish and wildlife.

1. TYPE OF CROSSING

- **General:** Open arches or bridges are preferred over culverts
- **Optimum:** Open arches or bridges required unless there is a compelling reason why culverts would provide greater environmental benefits

2. CULVERTS

- Culverts should be embedded (sunk into stream) at least one foot for box culverts and pipe arches, or at least 25% of the pipe diameter for pipe culverts
- If pipe culverts cannot be embedded this deep, then they should not be used.

3. WIDTH

- **General:** The crossing should be at least 1.2 times the bankfull width of the stream
- **Optimum:** The crossing should be at least 1.2 times the bankfull width of the stream and should span the banks to allow for dry wildlife passage during at least ten months of the year

4. OPENNESS

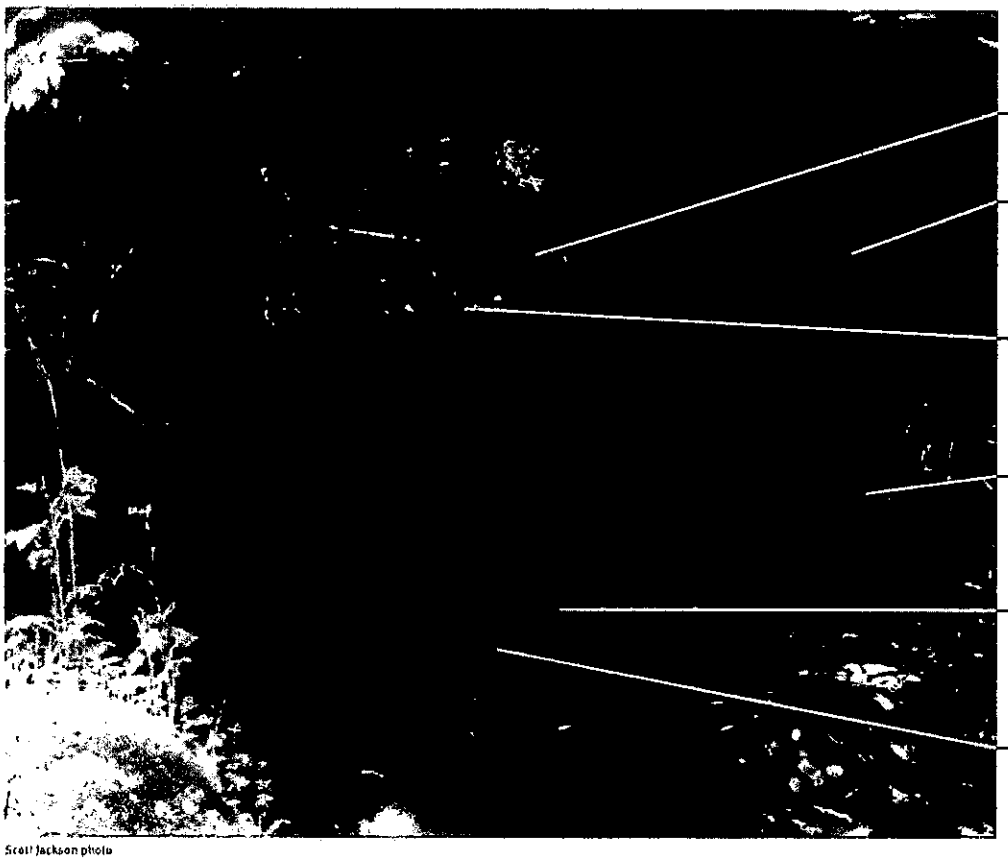
- **General:** Openness ratio (cross-sectional area/crossing length) of at least 0.25 meters (m). The crossing should be wide and high relative to its length.
- **Optimum:** Openness ratio of at least 0.5m and minimum height of 4 feet. If local conditions significantly reduce wildlife passage near the crossing (e.g., steep embankments and physical barriers) then the openness ratio should be 0.75m and the minimum height should be 6 feet.

5. SUBSTRATE

- Natural bottom substrate should be used within the crossing and it should match the upstream and downstream substrates. The substrate and design should resist displacement during floods and maintain an appropriate bottom during normal flows.

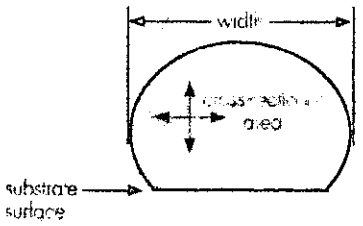
6. DEPTH AND VELOCITY

- At low flows, water depths and water velocities should be the same as they are in natural areas upstream and downstream of the crossing.

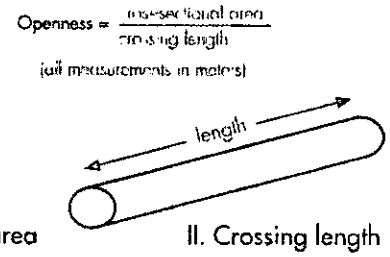


Scott Jackson photo

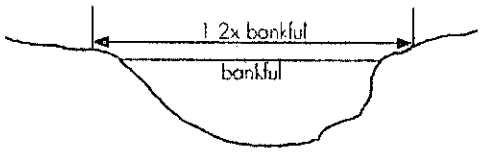
COMMON STREAM CROSSING MEASUREMENTS



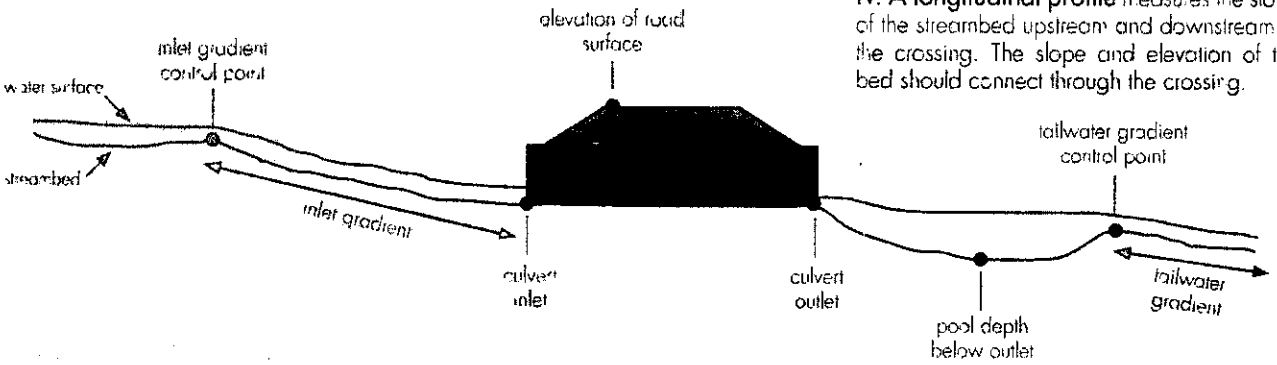
I. Culvert width and cross-sectional area



II. Crossing length



III. Stream width



IV. A longitudinal profile measures the slope of the streambed upstream and downstream of the crossing. The slope and elevation of the bed should connect through the crossing.

REPLACING OR RETROFITTING CROSSINGS

Most stream crossings in Massachusetts were designed and installed at a time when the environmental impacts of such crossings were not understood. Even effective—but aged—crossings may need to be upgraded or replaced because they have weathered decades of floods and erosion. Periodic upgrading of bridges, culverts, and roads is often required to keep crossings safe and effective.

Repairing or replacing deteriorated culverts is not always as straightforward as installing a larger pipe. Streams may naturally adapt to problems caused by poorly designed or degraded crossings.

Replace...

- If a crossing is structurally poor or degraded
- If a crossing is undersized for flood flows
- If a crossing cannot be fixed to allow wildlife passage
- If replacement will not impact critical wetlands
- If replacement is within a project's budget

Retrofit...

- If a crossing is structurally sound
- If a crossing is large enough for flood flows
- If a retrofit will allow wildlife passage
- If replacement will negatively affect critical wetlands
- If the replacement cost is too high

The benefits of retrofitting or replacing a crossing should be weighed against the costs of the project and the environmental consequences. If feasible, a culvert should be replaced. Careful analysis—drawing on the expertise of engineers, construction professionals, and conservation commissioners—should consider the following:

- Potential for downstream flooding
- Effect on upstream, downstream, and riparian habitat
- Potential for erosion, including headcutting (progressive channel erosion upstream of culvert)
- Overall effect on stream stability

When replacement is desirable, the standards for new crossings should be adhered to as much possible. Crossings should be designed to weather a large flood safely. Otherwise, erosion will occur and the crossing will need to be fixed or replaced again. In some cases a retrofit may be more appropriate, leaving the current culvert in place and adjusting the streambed to eliminate perching, or adding bed material inside the culvert to create a more natural streambed.

For a replacement culvert, a longitudinal profile of the streambed, both upstream and downstream of the culvert, should be completed to determine how well the up and downstream streambed slopes and elevations match. If there is a significant difference, there is a potential for significant erosion of the streambed, particularly if the new culvert is larger, and additional considerations will have to be taken in the design.

CASE STUDY
Reconnecting Bronson Brook


Blacknose dace


Double box culvert at Dingle Road


Perched culvert at Cummington Road

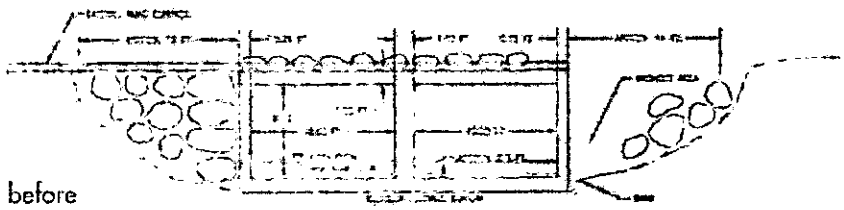
A stream restoration project in Bronson Brook in Worthington, Massachusetts will restore continuity in a high quality cold-water stream by replacing and retrofitting two culverts. A flood in 2003 destroyed the road around the undersized Dingle Road culvert and badly damaged the stream banks; the road has been closed ever since.

The Dingle Road crossing is a double box culvert set on bedrock. The crossing is perched above the streambed about one foot and the flood created a gap in the road around the culvert. A nearby crossing at Cummington Road is structurally sound, but perched about one foot above the downstream pool. River Continuity volunteers identified the Dingle Road and Cummington Road crossings as barriers to wildlife movement and have used these sites as model River Continuity projects.

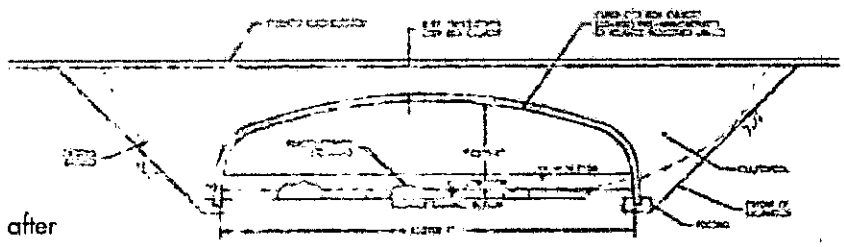
Many local partners are interested in this project because Bronson Brook is an important resource for Eastern brook trout, blacknose dace, Atlantic salmon, and other coldwater species. Partners met to discuss the options and costs and decided that replacement with an open bottom arch culvert was the best choice for Dingle Road. An open bottom arch allows for natural flows through the crossing and reduces the chance of woody material catching and blocking the culvert, thereby reducing the chance of another flood overtopping the culvert.

At Cummington Road, partners decided to retrofit the crossing because it was already large enough to pass flood flows and it was structurally sound. They will build a downstream riffle to raise the water level high enough to eliminate perching, and install retention sills within the culvert to retain natural bed materials. Fish and salamanders won't be the only ones to benefit—the project will ultimately reduce maintenance costs for the town, reconnect access for residential and emergency vehicles, and protect municipal and private infrastructure.

Project partners: Massachusetts Riverways Program, Town of Worthington, Division of Fisheries & Wildlife, Natural Resources Conservation Service (USDA), Westfield Wild & Scenic Committee, Westfield River Watershed Association, The Nature Conservancy, and Inter-Fluve Inc.


before

The double box culvert at Dingle Road will be replaced with a large open-bottom arch with natural bed materials. The local trout and salmon population can't wait.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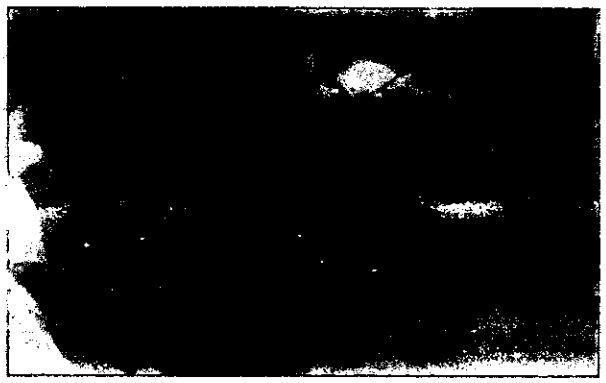
CASE STUDY
Tidal Restrictions: Unique Opportunities



Old tidal restriction before replacement (MA Coastal Zone)

New box culvert that allows full tidal flushing (MA Coastal Zone)

Crossings of tidal creeks and salt marshes deserve special consideration because of their unique tidal dynamics and effects on upstream habitats. Crossings that are too small to pass the full tidal range are known as tidal restrictions, and their impacts can be severe. By limiting tidal flow like the choke point of an hourglass, restrictions alter water levels and chemistry, diminish sources of ocean nutrients, and can degrade entire upstream aquatic systems. They often block the passage of fish and other aquatic life into important habitats and create favorable conditions for invasive species such as Phragmites. Installing a larger culvert or bridge restores the natural tidal flow needed to support healthy marsh habitats.

Hammetts Cove, Marion, Massachusetts

The Hammetts Cove site consists of a municipal road that crosses a tidal creek. The creek used to flow through an old pipe that severely restricted the tidal range because it was too small (above left). The restriction caused severe degradation in six acres of upstream salt marsh that was being taken over by invasive species (*Phragmites*), woody trees and shrubs. Assessment at the site included a tidal range survey to measure the tidal cycle upstream and downstream of the culvert. In 2001, town officials partnered with federal and state restoration programs to replace the old pipe with a larger concrete box culvert that was sized to pass the full tidal range. This significantly enhanced tidal flushing to the upstream salt marsh and will restore fish passage, reduce invasive species, and increase native salt marsh vegetation.

Project Parters: Massachusetts Office of Coastal Zone Management, Town of Marion, U.S. Fish and Wildlife Service, Natural Resources Conservation Service, Buzzards Bay Project, Sippican Lands Trust

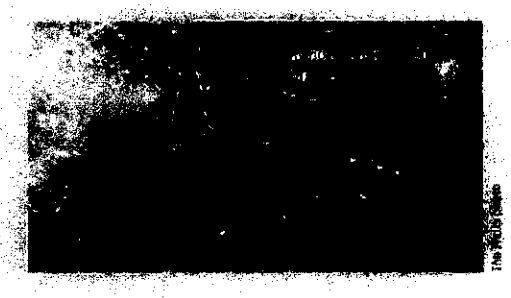
CONSERVATION TARGETS

The choice for a crossing design will depend in part on whether a stream has statewide or regional significance for landscape-level connectedness or provides critical habitat for rare or endangered species. In 2001, Massachusetts Division of Fisheries and Wildlife produced *Biomap: Guiding Land Protection for Biodiversity in Massachusetts*. They followed this in 2003 with *Living Waters: Guiding the Protection of Freshwater Biodiversity in Massachusetts*. These publications identify areas that need to be protected to preserve Massachusetts' non-marine biodiversity, and allow local groups to proactively identify conservation targets within their jurisdictions.

Biomap and *Living Waters* defined **core habitat** based on presence of rare plants, rare animals, and exemplary habitats. For each core habitat, they designated a critical **supporting watershed** (or landscape) needed to sustain a core habitat. Detailed town maps and databases that document the presence of core habitats and critical supporting watersheds throughout Massachusetts are available to determine whether a particular location should receive special protection.

When evaluating an existing stream crossing or planning a new one, project managers should coordinate with local conservation commissions.

- **Core habitat:** Optimum standards required
- **Critical supporting watersheds:** Optimum standards strongly recommended; general standards required



TECHNICAL CONCERNS

This document presents minimum needs for fish and wildlife and is not intended to be an engineering design manual. Qualified personnel should carefully consider engineering design and construction techniques for each crossing. Hydraulic analyses are conducted to ensure that a crossing is sufficient for passing floods and will not cause water to scour the streambed at crossing. Structural analyses are necessary to ensure that crossings are safe, particularly for new bridges. For replacement crossings, the slope of the streambed upstream and downstream of the crossing should be compared (known as a longitudinal profile) to ensure that the slope and elevation of the bed connects through the crossing. If it does not connect, excessive streambed erosion can result upstream of the culvert (known as a headcut) or other problems can arise. Qualified consultants can provide technical assistance on all of these issues.

CONCLUSION

Most Massachusetts citizens agree that protecting the environment, while accommodating a growing population and sustaining the economy, is a priority. The transportation infrastructure is essential to our way of life, and because that infrastructure cuts across natural ecosystems, it is imperative that we find ways to minimize adverse effects on habitats and wildlife.

Stream crossing designs have improved in recent years through the collaborative efforts of engineers, construction professionals, and environmental scientists. Safe and stable stream crossings can accommodate wildlife and protect stream health while reducing expensive erosion and structural damage. Further, federal regulations for Massachusetts require that all new stream crossings meet minimum design standards.

This booklet is intended to raise awareness about stream crossings and river continuity, and to introduce new standards for stream crossings. Qualified personnel can provide guidance on technical considerations that this booklet does not address (see left). By adhering to the crossing standards in the *Massachusetts Stream Crossings Handbook*, town conservation commissioners, highway departments, and town engineers can play a vital role in protecting and restoring stream continuity in Massachusetts.

GETTING MORE INFORMATION

Technical Guidance and Assistance

The Stream Continuity website, maintained by UMass Extension, has up-to-date guidelines and crossing standards and information on crossing problems, the ecological importance of river continuity and further resources. Staff at the Massachusetts Riverways Program are also available to provide suggestions and guidance to improve fish and wildlife movement through stream crossings.

When dealing with a coastal tidal restriction, please contact the Massachusetts Wetlands Restoration Program (WRP) in the Office of Coastal Zone Management. Many sources of assistance and funding are available. For more information, contact WRP at:

Phone: 617-626-1200
Email: wetlands.restoration@state.ma.us

Further Reading

Barbour, H., T. Simmons, P. Swain, and H. Woolsey. 1998. Our Irreplaceable Heritage. Protecting Biodiversity in Massachusetts. Natural Heritage and Endangered Species Program, Massachusetts Division of Fisheries and Wildlife, and Massachusetts Chapter of The Nature Conservancy. Boston, MA.

Natural Heritage and Endangered Species Program. 2001. Biomap: Guiding Land Conservation for Biodiversity in Massachusetts. Massachusetts Division of Fisheries and Wildlife, Westborough, MA.

Natural Heritage and Endangered Species Program. 2003. Living Waters: Guiding the Protection of Freshwater Biodiversity in Massachusetts. Massachusetts Division of Fisheries and Wildlife, Westborough, MA.

Washington Department of Fish and Wildlife. Design of Road Culverts for Fish Passage (web-based document; www.wdfw.wa.gov/hab/engineer/cm/culvert_manual_final.pdf

Web Sites

Stream Continuity - UMass Extension
www.streamcontinuity.org

Massachusetts Riverways Program
www.massriverways.org

Massachusetts Natural Heritage and Endangered Species Program
www.mass.gov/dfwele/dfw/nhesp/nhesp.htm

Massachusetts Office of Coastal Zone Management
www.mass.gov/czm/

Massachusetts Division of Fisheries and Wildlife
www.masswildlife.org

Massachusetts Wetlands Restoration Program
www.mass.gov/czm/wrp/

MASSACHUSETTS RIVER AND STREAM CROSSING STANDARDS

Developed by the

RIVER AND STREAM CONTINUITY PARTNERSHIP

Including:

University of Massachusetts Amherst

The Nature Conservancy

Massachusetts Division of Ecological Restoration-Riverways Program

American Rivers

March 1, 2006
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Northampton, MA 01060
413-584-2183; asingler@americanrivers.org

For more information go to: www.streamcontinuity.org.

REGULATORY REQUIREMENTS

These standards are not regulations. Local, state and/or federal regulatory authorities will decide the degree to which these standards are adopted, implemented and enforced. For information about regulatory requirements involving these standards please consult the applicable regulations, policies or guidelines and the agencies responsible.

TABLE OF CONTENTS

INTRODUCTION

Movement of fish and wildlife through river and stream corridors is critical to the survival of individual organisms and the persistence of populations. However, as long and linear ecosystems, rivers and streams are particularly vulnerable to fragmentation. In addition to natural barriers, a number of human activities can, to varying degrees, disrupt the continuity of river and stream ecosystems. The most familiar human-caused barriers are dams. However, there is growing concern about the role of river and stream crossings, and especially culverts, in disrupting river and stream continuity.

Road networks and river systems share several things in common. Both are long, linear features of the landscape. Transporting materials (and organisms) is fundamental to how they function. Connectivity is key to the continued functioning of both systems. Ultimately, our goal should be to create a transportation network that does not fragment or undermine the essential ecological infrastructure of the land and its waterways.

With funding from the Sweetwater Trust, Massachusetts Watershed Initiative, Nature Conservancy and Massachusetts Division of Ecological Restoration – Riverways Program, the University of Massachusetts–Amherst coordinated an effort to create river and stream crossing standards and a volunteer inventory program for culverts and other crossing structures to more effectively identify and address barriers to fish movement and river and stream continuity. Information was compiled about fish and wildlife passage requirements, culvert design standards, and methodologies for evaluating barriers to fish and wildlife passage.[1] This information was used to develop performance standards for culverts and other stream crossing structures.

The first version of the Massachusetts River and Stream Crossing Standards was released in August of 2004. The Standards were developed by the River and Stream Continuity Partnership with input from an Advisory Committee that included representatives from UMass-Amherst, MA Division of Ecological Restoration – Riverways Program, Massachusetts Watershed Initiative, Trout Unlimited, The Nature Conservancy, the Westfield River Watershed Association, ENSR International, MA Department of Transportation, MA Department of Environmental Protection and the MA Department of Conservation and Recreation. In developing the standards, the Partnership received advice from a Technical Advisory Committee that included representatives of the U.S. Fish and Wildlife Service, USGS Biological Resources Division (BRD), U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, MA Division of Fisheries and Wildlife, American Rivers, Connecticut River Watershed Council, Connecticut Department of Environmental Protection, a hydraulic engineering consultant, as well as input from people with expertise in Stream Simulation approaches to crossing design[2]. The standards are intended for new permanent crossings (highways, railways, roads, driveways, bike paths, etc.) and, when possible, for replacing existing permanent crossings. After the U.S. Army Corps of Engineers referenced the Standards in the Massachusetts Programmatic General Permit in 2005, a revised version with additional explanatory language was issued on March 1, 2006.

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[1] In developing the Standards the Partnership benefited greatly from work that has been done and materials developed over the years in Washington State, Oregon, California, and Maine, and by the U.S. Forest Service.

[2] Special thanks go to Ken Kozmo Bates and Kim Johansen for their review and useful comments on previous drafts of the Crossing Standards.

With the reissuance in January 2010 of the U.S. Army Corps of Engineers General Permit for Massachusetts, the River and Stream Continuity Partnership decided it was time to evaluate and, as appropriate, to revise the Massachusetts River and Stream Crossing Standards. Feedback on the March 1, 2006 version of the Standards was sought via a web-based survey implemented in 2009. The web survey was not a scientific survey but was essentially a targeted public comment process where input was solicited to gain insight into the issues at hand and suggestions sought on how to improve the Standards. What follows are updated versions of the previous Crossing Standards with modifications based on experience and the input received.

Goals

These standards seek to achieve, to varying degrees, three goals:

1. Fish and other Aquatic Organism Passage: Facilitate movement for fish and other aquatic organisms, including relatively small, resident fish, semi-aquatic amphibians & reptiles, and large invertebrates (e.g. crayfish, mussels).

2. River/Stream Continuity: Maintain continuity of the aquatic and benthic elements of river and stream ecosystems, generally through maintenance of appropriate substrates and hydraulic characteristics (water depths, turbulence, velocities, and flow patterns). Maintenance of river and stream continuity is the most practical strategy for facilitating movement of small, benthic organisms as well as larger, but weak-swimming species such as salamanders and crayfish.

3. Wildlife Passage: Facilitate movement of wildlife species including those primarily associated with river and stream ecosystems and others that may utilize riparian areas as movement corridors. Some species of wildlife such as muskrats and stream salamanders may benefit from river and stream continuity. Other species may require more open structures as well as dry passage along the banks or within the streambed at low flow.

For purposes of these standards full "aquatic organism passage" (AOP) is achieved when a road-stream crossing allows unrestricted movement of all aquatic organisms indigenous to the water body. By aquatic organisms we mean fish and the aquatic life stages of other vertebrates (amphibians), and aquatic invertebrates including small benthic fauna that typically reside within the stream substrate. Unrestricted movement means that all individuals and all life stages are able to move through the structure as freely as they can through the natural stream channel and without delays or obstructions caused by the crossing structure. Full AOP is generally achieved when goals 1 and 2 above are met. Crossing structures that achieve full AOP are expected to maintain more natural river hydrology and transport of sediment and woody debris.

There are a few approaches available for designing river and stream crossings. These Crossing Standards are most consistent with a "Stream Simulation"[3] approach for crossing design. Given the large number of species that make up river and stream communities and the almost complete lack of information about swimming abilities and passage requirements for most organisms, it is impractical to use a species-based approach for designing road-stream crossings. The Stream Simulation approach is

[3] U.S. Forest Service, 2008, Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings, WEB: http://www.stream.fs.fed.us/fishxing/aop_pdfs.html

the most practical way to maintain viable populations of organisms that make up aquatic communities and maintain the fundamental integrity of river and stream ecosystems. Stream Simulation is an ecosystem-based approach that focuses on maintaining the variety and quality of habitats, the connectivity of river and stream ecosystems, and the essential ecological processes that shape and maintain these ecosystems over time.

Stream Simulation is a design approach that avoids flow constriction during normal conditions and creates a stream channel that maintains the diversity and complexity of the streambed through the crossing. Crossing structures that avoid channel constriction and maintain appropriate channel conditions (channel dimensions, banks, bed, and bed forms) within the structure should be able to accommodate most of the normal movements of aquatic organisms, and preserve (or restore) many ecosystem processes that maintain habitats and aquatic animal populations. The goal is to create crossings that are essentially "invisible" to aquatic organisms by making them no more of an obstacle to movement than the natural channel.

Some stream and river corridors are also important for maintaining landscape-level connectedness for terrestrial wildlife. In these cases the standards go beyond what is necessary for aquatic organism passage and are intended also to facilitate the movement of a full range of vertebrate wildlife species (mammals, amphibians, reptiles). When wildlife are able to move through road-stream crossings they are less likely to be killed crossing over the road surface.

These standards are for general use to address issues of river and stream continuity, fish passage and wildlife movement. In some cases, site constraints may make strict adherence to the standards impractical or undesirable. For example, in some situations the road layout and surrounding landscape may make it impossible or impractical to achieve the recommended standards for height and openness. These standards may not be appropriate for degraded streams or highly urbanized areas where stream instability may be a serious concern. Site-specific information and good professional judgment should always be used to develop crossing designs that are both practical and effective.

Considerations

Here are some important considerations to keep in mind when using these standards.

1. These standards were developed specifically for freshwater, non-tidal rivers and streams and may not be appropriate for coastal waterways.
2. They are intended for permanent river and stream crossings. They are not intended for temporary crossings such as skid roads and temporary logging or construction access roads unless they impact streams that support anadromous fish. The objective of the Crossing Standards is the long term conservation of wildlife, fish and biodiversity resources that can be adversely affected by the barrier effects of road-stream crossings. The impacts of those crossings are a concern when they are manifested at the population level. To the degree that temporary crossings do not result in long-term (sustained) adverse effects on populations of aquatic organisms they should not be the focus of these Standards. For purposes of these Standards a temporary crossing is defined as one that will be in place for three years or less unless the stream supports anadromous fish runs. Temporary crossing of streams that support anadromous fish should either meet the crossing standards or be otherwise designed not to disrupt the movement of anadromous species using the stream.

3. These standards are not intended for constructed drainage systems designed primarily for irrigation or the conveyance of storm water. Examples include artificial channels, drainage ditches, grassy swales and stone-lined channels when created for the sole purpose of irrigation or storm water management. Natural channels that have been modified to serve an irrigation or storm water management function may still be important for aquatic organism passage and may warrant the use of these standards.

4. The purpose of these standards is to prevent barrier effects of road-stream crossings on populations of fish and wildlife (including invertebrates). It is generally presumed that perennial streams and rivers are always important as habitat and/or movement corridors for aquatic organisms. Many intermittent streams serve as seasonal habitat for fish (especially brook trout) and stream salamanders (two-lined, dusky and spring salamanders). It is not appropriate to dismiss intermittent streams as unimportant for fish and wildlife passage. However, these standards are not intended for channels that lack habitat for fish or wildlife and do not serve as movement corridors needed to access appropriate habitat. That said it can be difficult to determine whether any particular intermittent stream is important for fish and wildlife passage. Unless compelling evidence exists to indicate otherwise, intermittent streams are assumed to have value for fish and wildlife passage.

5. These standards were developed with the objective of facilitating fish and wildlife movement and the preservation or restoration of river/stream continuity. They may not be sufficient to address drainage or flood control issues that must also be considered during design and permitting of permanent stream crossings. These standards are not intended to address wetland crossings.

6. These standards are not prescriptive. They are intended as conceptual performance standards for river and stream crossings. They establish minimum criteria that are generally necessary to facilitate fish and wildlife movement and maintain river/stream continuity. Use of these standards alone will not satisfy the need for proper engineering and design. In particular, appropriate engineering is required to ensure that structures are sized and designed to provide adequate capacity (to pass various flood flows) and stability (bed, bed forms, footings and abutments).

7. The design of any structure must consider the channel type and long profile and must account for likely variability of the stream or river for the life of the structure. A "long profile" is a surveyed longitudinal profile along the thalweg (deepest portion of the channel) of the stream extending well upstream and downstream of the crossing.

8. In urbanizing environments there is greater potential for land use changes to result in stream instability. Wherever there is potential for stream instability it is important to evaluate stream adjustment potential at the crossing location and to factor this into the design of the structure. (This is true of all crossing structures whether or not they are designed to these standards.)

9. For guidance on the technical issues associated with meeting these standards refer to the U.S. Forest Service publication "Stream Simulation: an Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings" available at http://www.streamcontinuity.org/online_docs.htm.

DESIGN STANDARDS FOR NEW CROSSINGS

These standards are for new structures at sites where no previous crossing structure existed. Culvert replacements are addressed in the following section "Applying the Standards to Culvert Replacement Projects."

There are two levels of standards (General and Optimum) to balance the cost and logistics of crossing design with the degree of river/stream continuity warranted in areas of different environmental significance.

General Standards

Goal: Fish passage, river/stream continuity, some wildlife passage

Application

Where new permanent stream crossings are planned on streams or rivers (including intermittent streams) serving as habitat for fish and semi-aquatic wildlife that typically live within stream channels (salamanders, turtles), they should at least meet general standards to pass most fish species, maintain river/stream continuity, and facilitate passage for some wildlife.[4]

Many intermittent streams serve as seasonal habitat for fish (especially brook trout) and stream salamanders (two-lined, dusky and spring salamanders). Although intermittent channels that don't support fish and semi-aquatic wildlife may be used by terrestrial wildlife to move through the landscape, passage for terrestrial wildlife is not the focus of the "General" Standards; they are addressed in the "Optimum" Standards (below). Insects may use intermittent streams above those sections used by fish and semi-aquatic wildlife. However, they typically have adult life stages capable of flight thereby reducing concerns about the impact of road-stream crossing barriers.

General standards call for open bottom structures or culverts that span the river/stream channel with natural bottom substrates that generally match undisturbed upstream and downstream substrates. Stream depth and velocities in the crossing structure during low-flow conditions should approximate those in the natural river/stream channel. A critical element of any stream crossing structure or span design involves identifying the proper "openness". Openness is the cross-sectional area of a structure opening divided by its crossing length when measured in consistent units.[5] An openness of 0.82 ft (0.25 meters) will pass some wildlife species but is unlikely to pass all the wildlife that would be accommodated by the optimum standards.

Standards

1. *Spans (bridges, 3-sided box culverts, open-bottom culverts or arches) that preserve the natural stream channel are strongly preferred.*

[4] These standards are also appropriate for a portion of a stream where fish and wildlife were historically present but were lost as a result of migratory barriers when there is a reasonable expectation that they could be restored to that stream section.

[5] New England District, U.S. Army Corps of Engineers, Regulatory Division, Openness Ratio Spreadsheet, WEB: http://www.nae.usace.army.mil/reg/Stream/OpennessRatioSpreadsheet.pdf

The preference for spans is to avoid or minimize disruption to the streambed. The structure's design and construction should allow the streambed's natural structure and integrity to remain intact, and work in the stream should be minimized to the greatest extent practicable.

Site constraints may make the use of spans impractical and in some cases well-designed culverts may actually perform better than bridges (e.g. areas with deep soft substrate). However, circumstances where culverts are likely to out-perform spans for aquatic organism passage are very uncommon. Experience has demonstrated that the construction of culverts to meet these standards is not easy. In the vast majority of cases it requires a structure large enough to accommodate equipment for the construction of a stream channel and bed within the culvert. Problems in the design and construction of stable and functional stream channels within culverts are common. In areas where site constraints don't limit the usefulness of these structures, spans that preserve the natural stream channel are strongly preferred over culverts.

2. *If a culvert, then it should be embedded:*
   - *a minimum of 2 feet for all culverts,*
   - *a minimum of 2 feet and at least 25 percent for round pipe culverts*
   - *When embedment material includes elements > 15 inches in diameter, embedment depths should be at least twice the D_{84} (particle width larger than 84 % of particles) of the embedment material*

   These minimum embedment depths should be sufficient for many culverts. However, circumstances may dictate a need for deeper substrates that are based on site specific analysis. These include high gradient streams and streams experiencing instability or with potential instability that could result in future adjustments to channel elevation. In these cases long profiles and calculations of potential channel adjustments should be used to determine embedment depth.

   The intent of this standard is to provide for:

   - Sufficient depth of material within the culvert to achieve stability of the culvert bed material comparable to that of the upstream and downstream channel. For finer components of the substrate natural movement of bedload could be expected to replace material in the structure that is lost from the culvert during typical high flow events. However, the embedment material must be designed to resist the complete loss of substrate during large, infrequent storms (e.g. 100-year storms),
   - Sufficient depth of material to permit shaping of material to achieve natural water depths at low-flow conditions, and
   - Sufficient embedment to account for long-term vertical channel adjustment anticipated for the adjacent streambed.

   For most crossings embedment material will need to be put in place using equipment; only rarely can bedload transport be relied on to supply a culvert with adequate embedment material.

   Use of sills or other similar structural elements designed to hold the substrate in place within a culvert are strongly discouraged for new crossings. Should the substrate material be washed out

of a culvert by an infrequent storm the barrier effects of the sills are likely to be worse than that of a bare culvert.

In some cases site constraints may limit the degree to which a culvert can be embedded. In these cases pipe culverts should not be used and pipe arches (with at least 2 feet of embedment), open-bottom arches, or bridges should be considered instead.

Use scour analyses to determine footing depths for open-bottom arches, open-bottom boxes and bridges.

For guidance on the technical issues associated with culvert embedment refer to the U.S. Forest Service publication "Stream Simulation: an Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings" available at http://www.streamcontinuity.org/online_docs.htm.

3. *Spans channel width (a minimum of 1.2 times the bankfull width)*

   It is critical to avoid channel constriction during normal bankfull flows. A width of 1.2 times bankfull width is the minimum width needed to meet these standards. Bankfull width should be determined as the average of at least three typical widths, ideally measured at the proposed structure's location, and then upstream and downstream of the proposed structure (except where stream sections are not representative of conditions where the structure will be located). The stream width should be measured at straight sections of the channel outside the influence of existing structures and unusual channel characteristics. The structure should not be narrower than the bankfull width at the crossing location.[6]

   In naturally constricted channels 1.2 times bankfull may also be adequate for passing large, infrequent storm events and maintaining stability of both the structure and channel. However, this should be verified through standard engineering practices and calculations.

   A clear span of 1.2 times bankfull may not be sufficient to ensure adequate water conveyance for large, infrequent flood events without destabilizing the stream channel. This is especially true for streams with broad floodplains. In these cases, wider structures or alternative means of conveying flood waters may be necessary. It is critically important that structure design on these streams be based on sound engineering and, to the extent possible, take into account the potential effects of climate change on future storm characteristics (e.g. storms are likely to be more severe) and how the hydrology of the stream could change due to development within the watershed.

   For guidance on the technical issues associated with sizing crossing structures refer to the U.S. Forest Service publication "Stream Simulation: an Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings" available at http://www.streamcontinuity.org/online_docs.htm.

4. *Natural bottom substrate within the structure*

   Careful attention must be paid to the composition of the substrate within the structure. The movement of benthic aquatic organisms could be obstructed or their necessary life-cycle movements could be substantially disrupted without a natural bottom forming a continuous

[6] Determining bankfull width and appropriate crossing width can be particularly difficult or even impossible in degraded or highly urban streams.

medium through the structure. Substrate characteristics may be a more important determinant of passability than water depth or velocity for animals that tend to crawl (salamanders, crayfish) rather than swim in streams systems.

The substrate within the structure should match the characteristics of the substrate in the natural stream channel (mobility, slope, stability, confinement) at the time of construction and over time as the structure has had the opportunity to pass significant flood events. Substrate should be designed to meet desired characteristics after a period of adjustment likely to occur after construction.

The substrate should be designed to resist the complete loss of bed material during large, infrequent storms and to maintain appropriate channel characteristics through natural bed load transport. The goal is to achieve a dynamic equilibrium whereby substrate lost due to bed load transport is balanced by the movement of substrate into the structure from upstream. Sometimes in order to ensure bed stability (stability is not the same as rigidity) at higher than bankfull flows it may be necessary to use larger substrate within the structure than is generally found in the natural stream channel. In these cases the substrate should approximate the natural stream substrate and when possible should fall within the range of variability seen in the natural channel upstream and downstream of the crossing.

For guidance on the technical issues associated with substrate and culvert embedment refer to the U.S. Forest Service publication "Stream Simulation: an Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings" available at http://www.streamcontinuity.org/online_docs.htm.

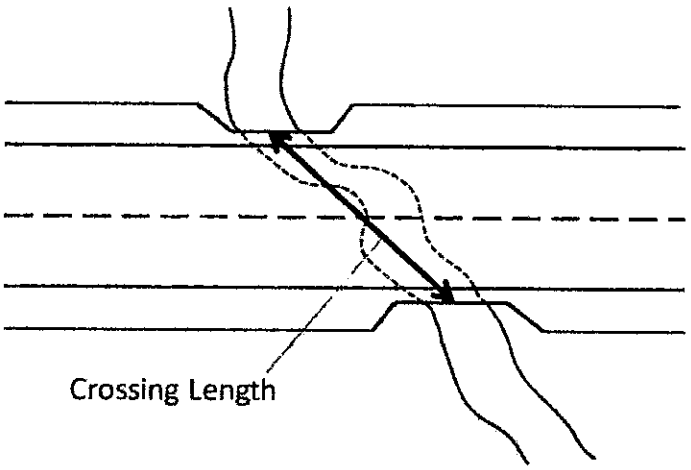
5. *Designed with appropriate bed forms and streambed characteristics so that water depths and velocities are comparable to those found in the natural channel at a variety of flows*

   In order to provide appropriate water depths and velocities at a variety of flows and especially low flows it is necessary to preserve or reconstruct the streambed within the structure. Otherwise, the width of the structure needed to accommodate higher flows will create conditions that are too shallow at low flows. The preference is to preserve the existing channel through the use of open-bottom spans wide enough to preserve the entire streambed. It is important that a continuous thalweg (deepest portion of the channel) be maintained through the structure. When constructing the streambed special attention should be paid to the sizing and arrangement of materials within the structure. If only large material is used, without smaller material filling the voids, there is a risk that flows could go subsurface within the structure.

   For guidance on the technical issues associated with the design and construction of stream channels and bed forms refer to the U.S. Forest Service publication "Stream Simulation: an Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings" available at http://www.streamcontinuity.org/online_docs.htm.

6. *Openness> 0.82 feet (0.25 meters)*

   Openness is the cross-sectional area of a structure opening divided by its crossing length when measured in consistent units (e.g. feet). For a box culvert, openness = (height x width)/ length.



For calculating openness length is measured as a straight line connecting the channel midpoint where it enters a structure and where it exits the structure.

For crossing structures with multiple cells or barrels, openness is calculated separately for each cell or barrel. At least one cell or barrel should meet the appropriate openness standard. The embedded portion of a culvert is not included in the calculation of cross-sectional area for determining openness.[7]

Openness > 0.82 feet is recommended to make the structure more likely to pass small, riverine wildlife such as turtles, mink, muskrat and otter that may tend to avoid structures that appear too constricted (see note at the end of this document). This openness standard is too small to accommodate large wildlife such as deer, bear, and moose. Structures that meet this openness standard are much more likely than traditional culverts to pass flood flows and woody debris that would otherwise obstruct water passage. It is likely that most structures that meet all the other general standards will also meet this openness standard. However, for some very long structures it may be impractical or impossible to meet this standard.

7. *Banks should be present on each side of the stream matching the horizontal profile of the existing stream and banks*

To prevent failure, all constructed banks should have a height to width ratio of no greater than 1.5:1 (horizontal:vertical) unless the stream is naturally incised. They should be tied into the up and downstream banks and configured to be stable during a 100-year storm event. The banks should be designed and constructed so as not to hinder riverine wildlife use of the streambed and banks for passage.

[7] An Embedded Area Spreadsheet developed by the U.S. Army Corps of Engineers shows how to calculate the open area for embedded pipe culverts to meet the 0.82 standard for openness. The spreadsheet can be downloaded from the Online Documents section of www.streamcontinuity.org.

Optimum Standards

Goal: Fish passage, river/stream continuity, wildlife passage

Application

Where permanent stream crossings occur or are planned in areas of particular statewide or regional significance for their contribution to landscape level connectedness optimum standards should be applied in order to maintain river/stream continuity and facilitate passage for fish and wildlife.

Areas of particular statewide or regional significance for their contribution to landscape level connectedness include, but are not limited to, rivers/streams and associated riparian areas that serve as corridors or connecting habitat linking areas of significant habitat (>250 acres) in three or more towns. There are no formal, recognized criteria for classifying streams as warranting optimum standards. The Nature Conservancy and University of Massachusetts Amherst are engaged in a project ("Critical Linkages") to objectively assess landscape-scale connectedness and define areas that serve as critical linkages for wildlife movement and connectivity. This (and potentially other similar projects) will provide assistance in identifying areas where it would be appropriate to use the optimum standards for road-stream crossings.

Where permanent stream crossings occur or are planned in areas of high connectivity value – areas of particular statewide or regional significance for their contribution to landscape level connectedness – crossings should be designed to maintain river/stream continuity and facilitate passage for fish and wildlife. The best designs for accomplishing this involve bridges that not only span the river/stream channel, but also span one or both of the banks allowing dry passage for wildlife that move along the watercourse. Where the crossing involves high traffic volumes or physical barriers to wildlife movement, the crossing structure should be sized to pass all wildlife species (minimum height and openness requirements).

Standards

1. *Use a bridge*

   Unless there are compelling reasons why a culvert would provide greater environmental benefits only bridges should be used. Bridges are preferred over open-bottom culverts because they can be installed with minimal impact to the stream channel and provide more headroom for wildlife.

2. *Span the streambed and banks*

   The structure span should be at least 1.2 times the bankfull width and provide banks on one or both sides with sufficient headroom to provide dry passage for semi-aquatic and terrestrial wildlife.

   It is critical to avoid channel constriction during normal bankfull flows. A width of 1.2 times bankfull width is the <u>minimum</u> width needed to meet these standards. Bankfull width should be determined as the average of at least three typical widths, ideally measured at the proposed structure's location, and then upstream and downstream of the proposed structure (except where stream sections are not representative of conditions where the structure will be located).

The stream width should be measured at straight sections of the channel outside the influence of existing structures and unusual channel characteristics. The structure should not be narrower than the bankfull width at the crossing location.[8]

For streams within floodplains 1.2 times bankfull may not be sufficient to ensure adequate water conveyance for large, infrequent flood events without destabilizing the stream channel. In these cases, wider structures or alternative means of conveying flood waters may be necessary. It is critically important that structure design on these streams be based on sound engineering and, to the extent possible, take into account the potential effects of climate change on future storm characteristics (e.g. storms are likely to be more severe) and how the hydrology of the stream could change due to development within the watershed.

For guidance on the technical issues associated with sizing crossing structures refer to the U.S. Forest Service publication "Stream Simulation: an Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings" available at http://www.streamcontinuity.org/online_docs.htm.

3. *Natural bottom substrate within the structure*

Careful attention must be paid to the composition of the substrate within the structure. The movement of benthic aquatic organisms could be obstructed or their necessary life-cycle movements could be substantially disrupted without a natural bottom forming a continuous medium through the structure. Substrate characteristics may be a more important determinant of passability than water depth or velocity for animals that tend to crawl (salamanders, crayfish) rather than swim in streams systems.

The substrate within the structure should match the characteristics of the substrate in the natural stream channel (mobility, slope, stability, confinement) at the time of construction and over time as the structure has had the opportunity to pass significant flood events. Substrate should be designed to meet desired characteristics after a period of adjustment likely to occur after construction.

The substrate should be designed to resist the complete loss of bed material during large, infrequent storms and to maintain appropriate channel characteristics through natural bed load transport. The goal is to achieve a dynamic equilibrium whereby substrate lost due to bed load transport is balanced by the movement of substrate into the structure from upstream. Sometimes in order to ensure bed stability (stability is not the same as rigidity) at higher than bankfull flows it may be necessary to use larger substrate within the structure than is generally found in the natural stream channel. In these cases the substrate should approximate the natural stream substrate and when possible should fall within the range of variability seen in the natural channel upstream and downstream of the crossing.

For guidance on the technical issues associated with substrate refer to the U.S. Forest Service publication "Stream Simulation: an Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings" available at http://www.streamcontinuity.org/online_docs.htm.

[8] Determining bankfull width and appropriate crossing width can be particularly difficult or even impossible in degraded or highly urban streams.

4. *Designed with appropriate bed forms and streambed characteristics so that water depths and velocities are comparable to those found in the natural channel at a variety of flows*

   In order to provide appropriate water depths and velocities at a variety of flows and especially low flows it is necessary to preserve or reconstruct the streambed within the structure. Otherwise, the width of the structure needed to accommodate higher flows will create conditions that are too shallow at low flows. The preference is to preserve the existing channel through the use of open-bottom spans wide enough to preserve the entire streambed. It is important that a continuous thalweg (deepest portion of the channel) be maintained through the structure. When constructing the streambed special attention should be paid to the sizing and arrangement of materials within the structure. If only large material is used, without smaller material filling the voids, there is a risk that flows could go subsurface within the structure.

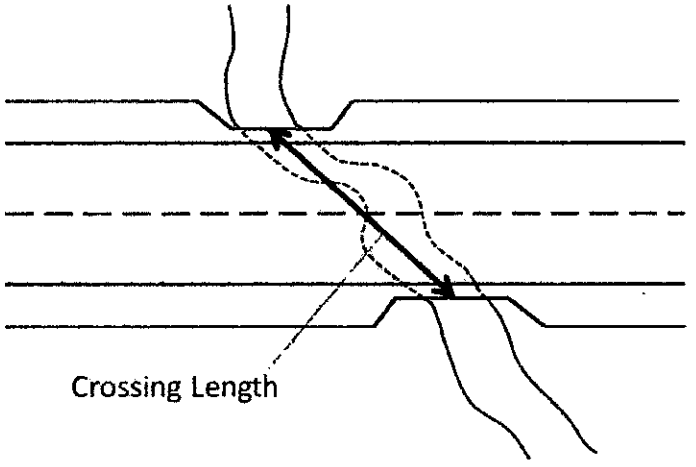
   For guidance on the technical issues associated with the design and construction of stream channels and bed forms refer to the U.S. Forest Service publication "Stream Simulation: an Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings" available at http://www.streamcontinuity.org/online_docs.htm.

5. *Maintain a minimum height of 8 ft (2.4 meters) and openness of 2.46 feet (0.75 meters) if conditions are present that significantly inhibit wildlife passage (high traffic volumes, steep embankments, fencing, Jersey barriers or other physical obstructions*

   If conditions that significantly inhibit wildlife passage are not present, maintain a minimum height of 6 ft. (1.8 meters) and openness of 1.64 feet (0.5 meters)

   Height should be measured from the average invert of the streambed within the structure to the inside top of the structure directly above. The invert is the elevation of the lowest point of the stream channel within the structure.

   Openness is the cross-sectional area of a structure opening divided by its crossing length when measured in consistent units (e.g. feet). For crossing structures with multiple bridge cells openness is calculated separately for each cell (do not add together the cross-sectional areas of multiple cells). At least one cell should achieve the appropriate openness standard.



For calculating openness length is measured as a straight line connecting the channel midpoint where it enters a structure and where it exits the structure.

6. *Banks should be present on each side of the stream matching the horizontal profile of the existing stream and banks with sufficient headroom to provide dry passage for semi-aquatic and terrestrial wildlife*

   To prevent failure, all constructed banks should have a height-to-width ratio no greater than 1.5:1 (horizontal:vertical) unless the stream is naturally incised. Banks within the structure should generally align with the profile and cross section of banks upstream and downstream of the structure and should be stable during a 100-year storm event. The banks should be designed and constructed so as not to hinder wildlife use of the streambed and banks for passage.

Standards Summary

	General Standards	Optimal Standard
Structure Type	Open-bottom span preferred	Bridge
Embedment	If a culvert, then it should be embedded: • A minimum of 2 feet for all culverts, • A minimum of 2 feet and at least 25 percent for round pipe culverts • When embedment material includes elements > 15 inches in diameter, embedment depths should be at least twice the D_{84} of the embedment material	NA
Crossing Span	Minimum: 1.2 x bankfull width	Minimum: 1.2 x bankfull width
Substrate	Matches stream substrate	Matches stream substrate
Water Depth & Velocity	Matches water depth & velocity in natural stream over a range of flows	Matches water depth & velocity in natural stream over a range of flows
Openness (& height)	Openness: 0.82 ft. (0.25 m)	Conditions that inhibit wildlife passage over road Openness: 2.46 ft. (0.75 m) Height: 8 ft. (2.4 m) Otherwise Openness: 1.64 ft. (0.5 m) Height: 6 ft. (1.8 m)
Banks	• On both sides of the stream • Match the horizontal profile of the existing stream and banks • Constructed so as not to hinder use by riverine wildlife	• On both sides of the stream • Match the horizontal profile of the existing stream and banks • Constructed so as not to hinder use by wildlife • Sufficient headroom for wildlife

APPLYING THE STANDARDS TO CULVERT REPLACEMENT PROJECTS

Given the number of culverts and other crossing structures that have been installed without consideration for ecosystem protection, it is important to assess what impact these crossings are having and what opportunities exist for mitigating those and future impacts. In the short term some barriers can be addressed by culvert retrofits: temporary modifications to improve aquatic organism passage short of replacement. However, culvert replacement and remediation generally offer the best opportunity for restoring continuity and long-term protection of river and stream ecosystems.

Methods have been developed, and are continuing to be refined and adapted, for evaluating culverts and other crossing structures for their impacts on animal passage and other ecosystem processes. Along with these assessments there needs to be a process for prioritizing problem crossings for remediation. The process should take into account habitat quality in the river or stream and surrounding areas, upstream and downstream conditions, as well as the number of other crossings, discontinuities (channelized or piped sections), and barriers affecting the system. It is important to use a watershed-based approach to river and stream restoration in order to maximize positive outcomes and avoid unintended consequences.

Culvert upgrading requires careful planning and is not simply the replacement of a culvert with a larger structure. Even as undersized culverts block the movement of organisms and material, over time, rivers and streams adjust to the hydraulic and hydrological changes caused by these structures. Increasing the size of a crossing structure can destabilize the stream and cause head cutting – the progressive down-cutting of the stream channel – upstream of the crossing. There also may be downstream effects such as increased sedimentation. Crossing replacement can result in the loss or degradation of wetlands that formed above the culvert as a consequence of constricted flow. In more developed watersheds, undersized culverts may play an important role in regulating storm flows and preventing flooding.

Before replacing a culvert or other crossing structure with a larger structure it is essential that the replacement be evaluated for its impacts on:

- downstream flooding,
- upstream and downstream habitat (in-stream habitat, wetlands),
- potential for erosion and head cutting, and
- stream stability.

In most cases it will be necessary to conduct engineering analyses including long profiles of sufficient length to understand potential changes in channel characteristics. A "long profile" is a surveyed longitudinal profile along the thalweg (deepest portion of the channel) of the stream extending well upstream and downstream of the crossing. The replacement crossing will need to be carefully designed in order to maximize the benefits and minimize the potential for negative consequences resulting from the upgrade. In many instances, some stream restoration will be needed upstream and/or downstream of the structure in addition to culvert replacement in order to restore river/stream continuity and facilitate fish and wildlife passage.

Culvert replacements need to be reviewed and permitted by the local conservation commission, the Massachusetts Department of Environmental Protection (§401 Water Quality Certification), and in some cases the U.S. Army Corp of Engineers.

Applying the Standards

1. *Replacement culverts should meet the design guidelines for either general standards or optimal standards (see Standards for New Crossings above) unless:*
    - *Doing so would result in significant stream instability that can't otherwise be mitigated*
    - *Meeting the standards would create a flooding hazard that can't otherwise be mitigated*
    - *Site constraints make it impossible to meet the standards*
2. *If it is not possible to meet all of the applicable standards, replacement crossings should be designed to avoid or mitigate the following problems.*

    → *Inlet drops*
    → *Outlet drops*
    → *Flow contraction that produces significant turbulence*
    → *Tailwater armoring*
    → *Tailwater scour pools*
    → *Physical barriers to fish and wildlife passage*

3. *If it is not possible to meet all of the applicable standards avoid Smooth High Density Polyethylene Pipes (HDPP) or other pipes with a Mannings n equal or less than 0.010.*
4. *As indicated by long profiles, scour analyses and other methods, design the structure and include appropriate grade controls to ensure that the replacement will not destabilize the river/stream*
5. *To the extent practicable conduct stream restoration upstream and/or downstream of the structure as needed to restore river/stream continuity and eliminate barriers to aquatic organism movement*

CONSTRUCTION BEST MANAGEMENT PRACTICES

Construction of road-stream crossings has the potential to generate significant adverse impacts to rivers and streams. Use of appropriate construction methods and best management practices (BMPs) are essential for meeting design standards and avoiding unnecessary impacts to water and habitat quality. Following are a list of BMPs that should be considered when installing or replacing road-stream crossings.[9]

Road and Crossing Location. Roads should be planned to avoid or minimize the number of road-stream crossings. Where crossings cannot be avoided they should be located in areas that will minimize impacts. Here are some rules of thumb.

- Avoid sensitive areas such as rare species habitat and important habitat features (vertical sandy banks, underwater banks of fine silt or clay, deep pools, fish spawning habitat).
- Avoid unstable or high-hazard locations such as steep slopes, wet or unstable slopes, non-cohesive soils, and bordering vegetated wetlands. Alluvial reaches (where soils were deposited and are shaped by flowing water) are poor locations for road-stream crossings.
- Where possible locate crossings on straight channel segments (avoid meanders)
- To the extent possible align crossings perpendicular to the stream channel

Timing of Construction. In general the most favorable time for constructing, replacing or maintaining road-stream crossings is during periods of low flow, generally July 1 through September 30. However, there may be occasions when a stream or river supports one or more rare species that would be particularly vulnerable to disturbances during low-flow conditions. Where rare species are a concern, contact the Massachusetts Natural Heritage and Endangered Species Program (NHESP) for information and advice on how to minimize impacts to those species. Such consultations are required for crossings that would affect areas of Priority Habitat identified by NHESP.

Dewatering

- Minimize the extent and duration of the hydrological disruption
- Consider the use of bypass channels to maintain some river and stream continuity during construction
- Use dams to prevent backwatering of construction areas
- Gradually dewater and re-water river and stream segments to avoid abrupt changes in stream flow
- Salvage aquatic organisms (fish, salamanders, crayfish, mussels) stranded during dewatering
- Segregate clean diversion water from sediment-laden runoff or seepage water
- Use anti-seep collars around diversion pipes
- Use upstream sumps to collect groundwater and prevent it from entering the construction site

[9] Much of the following information about construction BMPs comes from training materials used as part of the U.S. Forest Service's Aquatic Organism Passage project and and is included in the Forest Service publication "Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings."

- Collect construction drainage from groundwater, storms, and leaks and treat to remove sediment
- Use downstream sediment control sump to collect water that seeps out of the construction area
- Use fish screens around the intake of diversion pipes
- Use appropriate energy dissipaters and erosion control at pipe outlets
- When using diversion pipes make sure adequate pumping capacity is available to handle storm flows
- After construction remove cofferdams downstream-to-upstream in a manner that minimizes introduction of sediment to the waterway.

Storm Water Management, Erosion and Sediment Control

Use of a downstream sediment retention pond is strongly recommended for all projects that involve work within the streambed.

- Minimize bare ground
- Minimize impact to riparian vegetation
- Prevent excavated material from running into water bodies and other sensitive areas
- Use appropriate sediment barriers (silt fence, hay bales, mats, Coir logs, mulch or compost filter tubes)
- Dewater prior to excavation
- Manage and treat surface and groundwater encountered during excavation with the following
  - sediment basins
  - fabric, biobag or hay bale corals
  - irrigation sprinklers or drain pipes discharging into vegetated upland areas
  - sand filter
  - geotextile filter bags
- Turbidity of water 100-200 feet downstream of the site should not be visibly greater than turbidity upstream of the project site.

Pollution Control

- Wash equipment prior to bringing to the work area to remove leaked petroleum products and avoid introduction of invasive plants
- To avoid leaks, repair equipment prior to construction
- Be prepared to use petroleum absorbing "diapers" if necessary
- Locate refueling areas and hazardous material containment areas away from streams and other sensitive areas
- Establish appropriate areas for washing concrete mixers; prevent concrete wash water from entering rivers and streams

- Take steps to prevent leakage of stockpiled materials into streams or other sensitive areas (locate away from water bodies and other sensitive areas, provide sediment barriers and traps, cover stockpiles during heavy rains)

Construction of Streambed and Banks within Structures

- Check construction surveys to ensure slopes and elevations meet design specifications
- Use appropriately graded material (according to design specifications) that has been properly mixed before placement inside the structure
- Avoid segregation of bed materials
- Compact bed material
- After the streambed has been constructed wash bed material to ensure that fine materials fill gaps and voids
- Construct an appropriate low-flow channel and thalweg
- Carefully construct bed forms to ensure functionality and stability
- Construct well-graded banks for roughness, passage by small wildlife, and in-stream bank-edge habitat
- Tie constructed banks into upstream and downstream banks. Banks within the structure should generally align with the profile and cross section of banks upstream and downstream of the structure, and should be installed so that the juncture between natural bank and constructed bank is stable. The banks should be designed and constructed so as not to hinder wildlife use of the streambed and banks for passage.

Soil Stabilization and Re-vegetation

- Surface should be rough to collect seeds and moisture
- Implement seeding and planting plan that addresses both short term stabilization and long term restoration of riparian vegetation
- Water vegetation to ensure adequate survival
- Use seed, mulch, and/or erosion control fabrics on steep slopes and other vulnerable areas
- Avoid netting and other erosion control materials that contain coarse mesh capable of trapping and killing fish and wildlife if it gets washed into streams or rivers.
- Use native plants unless other non-invasive alternatives will yield significantly better results

Monitoring

- Ensure that BMPs are being implemented
- Inspect for erosion
- Evaluate structure stability
- Inspect for evidence of stream instability

- Inspect for presence of debris accumulations or other physical barriers at or within crossing structures
- Ensure streambed continuity is maintained
- Inspect for problems with infiltration in constructed streambeds (subsurface flows)
- Inspect for scouring of the streambed downstream or the aggradation of sediment upstream of the structure

GLOSSARY

→ **Aquatic Organism Passage** – Full "Aquatic Organism Passage" (AOP) is achieved when a road-stream crossing allows unrestricted movement of all aquatic organisms indigenous to the water body. Aquatic organisms are fish and the aquatic life stages of other vertebrates (amphibians), and aquatic invertebrates including small benthic fauna that typically reside within the stream substrate. Unrestricted movement means that all individuals and all life stages are able to move through the structure as freely as they can through the natural stream channel and without delays or obstructions caused by the crossing structure.

→ **Bankfull Width** – Bankfull is a geometric parameter that corresponds with the amount of water that just fills the stream channel and where additional water would result in a rapid widening of the stream or overflow into the floodplain. Indicators of Bankfull width include:

- Abrupt transition from bank to floodplain. The change from a vertical bank to a horizontal surface is the best identifier of the floodplain and Bankfull stage, especially in low-gradient meandering streams.
- Top of point bars. The point bar consists of channel material deposited on the inside of meander bends. Set the top elevation of point bars as the lowest possible Bankfull stage.
- Bank undercuts. Maximum heights of bank undercuts are useful indicators in steep channels lacking floodplains.
- Changes in bank material. Changes in soil particle size may indicate the operation of different processes. Changes in slope may also be associated with a change in particle size.
- Change in vegetation. Look for the low limit of perennial vegetation on the bank, or a sharp break in the density or type of vegetation.

→ **Bed Adjustment Potential** – Potential change in the elevation, width, depth, slope or meander pattern of the stream channel as it adjusts to a source of stream instability (changes in discharge, sediment supply, or base elevation). Instability may be caused by changes at a stream crossing site or conditions upstream or downstream of the crossing site or within the watershed (urbanization).

→ **Bedforms** – Natural bedforms include isolated boulders, particle clusters, steps, pools, head of riffles and pool tail crests, large woody debris, transverse bars, longitudinal ribs, and gravel bars. Constructed bedforms may include any of the above as well as rock and log weirs and roughened channels.

→ **Bridge** – As used in this document, a bridge is a bottomless structure erected over a river or stream to provide passage from one bank to the other. In this document bridges are grouped under the term "spans" along with open-bottom arch and open-bottom box culverts.

→ **Conditions that significantly inhibit wildlife passage** – These include high traffic volumes, steep embankments, fencing, Jersey barriers or other physical obstructions that prevent wildlife passage over the road surface

→ **Culvert** – As used in these Standards, culverts are round, elliptical or rectangular structures that are fully enclosed (contain a bottom) designed primarily for channeling water beneath a road, railroad or highway. Bottomless structures, though sometimes considered culverts by others, are treated separately in these Standards.

→ $\mathbf{D_{84}}$ – Particle width larger than 84 % of particles within a sampled streambed. Width is the diameter of the intermediate axis of a particle; not the longest axis (length) or the shortest axis (thickness).

→ **Embedded Culvert** – A culvert that is installed in such a way that the bottom of the structure is below the streambed and there is substrate in the culvert.

→ **Flow contraction** – When a culvert or other crossing structure is significantly smaller than the stream width the converging flow creates a condition called "flow contraction." The increased velocities and turbulence associated with flow contraction can block fish and wildlife passage and scour bed material out of a crossing structure. Flow contraction also creates inlet drops.

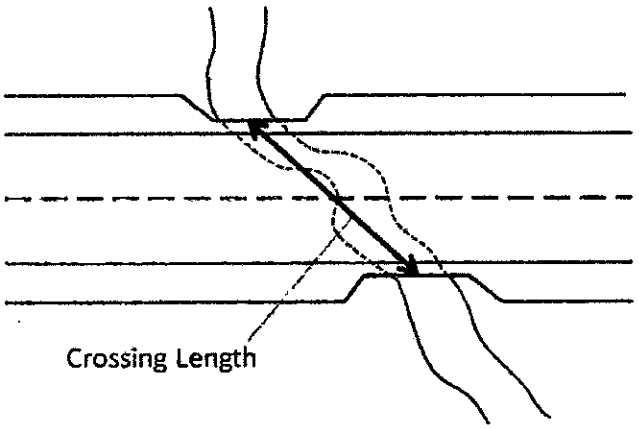
→ **Inlet drop** – Where water level drops suddenly at an inlet, causing changes in water speed and turbulence. In addition to the higher velocities and turbulence, these jumps can be physical barriers to fish and other aquatic animals when they are moving upstream and are unable to swim out of the culvert.

→ **Invert** – The elevation of the lowest point of a crossing structure or if embedded (or an open bottom structure) the lowest point of the stream channel within the structure.

→ **Long Profile** – A long profile is a surveyed longitudinal profile along the thalweg (deepest portion of the channel) of the stream extending well upstream and downstream of the crossing.

→ **Open Bottom Arch** – Arched crossing structures that span all or part of the streambed, typically constructed on buried footings and without a bottom.

→ **Openness**– Equals cross-sectional area of the structure opening divided by crossing length when measured in consistent units (e.g. feet). For a box culvert, openness = (height x width)/ length. For crossing structures with multiple cells or barrels, openness is calculated separately for each cell or barrel (do not add together the cross-sectional areas of multiple cells or barrels). At least one cell or barrel should achieve the appropriate openness standard. The embedded portion of a culvert is not included in the calculation of cross-sectional area for determining openness.



For calculating openness length is measured as a straight line connecting the channel midpoint where it enters a structure and where it exits the structure.

→ **Outlet drop** – An outlet drop occurs when water drops off or cascades down from a structure outlet, usually into a receiving pool. This may be due to the original culvert placement, erosion of material at the area immediately downstream of the culvert, or downstream channel adjustments that may have occurred subsequent to the culvert installation. Outlet drops are barriers to fish and other aquatic animals that can't jump to get up into the culvert.

→ **Physical barriers to fish and wildlife passage** – Any feature that physically blocks fish or wildlife movement through a crossing structure as well as features that would cause a crossing structure to become blocked. Beaver dams, debris jams, fences, sediment filling a culvert, weirs, baffles, aprons, and gabions are examples of structures that might be or cause physical barriers. Weirs are short dams or fences in the stream that constrict water flow or fish movements. Baffles are structures within culverts that direct, constrict, or slow down water flow. Gabions are rectangular wire mesh baskets filled with rock that are used as retaining walls and erosion control structures. Steeply sloping channels within a structure resulting in shallow flows and/or high velocity flows can also inhibit movement of fish and other aquatic organisms.

→ **Pipe Arch** – A pipe that departs from a circular shape such that the width (or span) is larger that the vertical dimension (or rise), and forms a continuous circumference pipe that is not bottomless.

→ **River/Stream Continuity** – Maintaining continuity of the aquatic and benthic elements of river and stream ecosystems, generally through maintenance of appropriate substrates and hydraulic characteristics (water depths, turbulence, velocities, and flow patterns)

→ **Span** – A bridge, 3-sided box culvert, open-bottom culvert or arch that spans the stream with abutments landward of the bankfull width

→ **Stream Simulation** – A design method in which the diversity and complexity of the natural streambed are created inside a culvert, open-bottom arch, or open-bottom box in such a way that the streambed maintains itself across a wide range of flows. The premise is that if

streambed morphology is similar to that in the natural channel the crossing will be invisible to aquatic species.

→ **Tailwater armoring** – Concrete aprons, plastic aprons, riprap or other structures added to culvert outlets to facilitate flow and prevent erosion.

→ **Tailwater scour pool** – A pool created downstream from high flows exiting the culvert. The pool is wider than the stream channel and banks are typically eroded. Some plunge pools may have been specifically designed to dissipate flow energy at the culvert outlet and control downstream erosion.

→ **Thalweg** – A line connecting the lowest points of a stream or river bed (the deepest part of the channel).

NOTES AND REFERENCES

Stream Simulation

An important source of information in this document comes from training materials used as part of the U.S. Forest Service's Aquatic Organism Passage (AOP) project. *"Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings"* is a detailed manual published by the Forest Service in 2008. The complete citation for this document is:

U.S. Forest Service Stream Simulation Working Group. 2008. Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings. San Dimas: U.S. Forest Service Technology and Development Program.

The document can be downloaded from the Online Documents section of the Streamcontinuity.org web site.

http://www.streamcontinuity.org/online_docs.htm

Openness

There is both published and anecdotal evidence from a variety of sources that some animals (including fish) may be reluctant to enter structures that appear too dark or confining. The occurrence of dead turtles, beavers, muskrat and other riverine animals on roadways above or near road-stream crossings suggests that certain structures may be too small or too confining to accommodate some wildlife.

The inverse of confinement is the concept of openness: the size of a structure opening relative to its length. Openness is defined as the cross-sectional area of the structure opening divided by crossing length measured in consistent units (e.g. feet).

Unfortunately, there is little information available on the openness requirements for fish and wildlife. Reed et al. (1979) concluded that 0.6 meters (2.0 feet) is the minimum openness needed for mule and whitetail deer to use a structure. In a study of box culverts in Pennsylvania the average openness for structures used by deer was 0.92 meters (3.0 feet) with a range of 0.46 (1.52 feet) to 1.52 meters (5.02 feet; Brudin 2003). A report from the Netherlands cites data indicating that crossing structures with openness < 0.35 meters (1.16 feet) were never used by deer while structures with openness > 1.0 meters (3.3 feet) were always used (The Netherlands Ministry of Transport 1995).

Although there are no data or studies available on the openness requirements for species other than deer, we chose to include openness as one of the standards in order to ensure some minimum level of openness. The openness standard of 0.82 feet (0.25 meters) in the general standards is well below that required by deer. The intent is to create an openness standard that is sufficient for fish and small riverine wildlife species. For most roadways, the openness standard in the optimum standards (1.64 feet; 0.50 meters) also falls below that generally required by deer. Only when applying the optimum standards under conditions that would inhibit wildlife passage over the road surface (Jersey barriers, fencing, high traffic volumes) does the openness standard (2.46 feet; 0.75 meters) fall within the range of values for deer. We expect that an openness standard of 2.46 feet (0.75 meters) also will be sufficient for other large mammals such as moose and bear.

Brudin, C.O. 2003. Wildlife Use of Existing Culverts and Bridges in North Central Pennsylvania. Pp. 344-352 In 2003 Proceedings of the International Conference on Ecology and Transportation, edited by C. Leroy Irwin, Paul Garrett, and K.P. McDermott. Raleigh, NC: Center for Transportation and the Environment, North Carolina State University, 2003..

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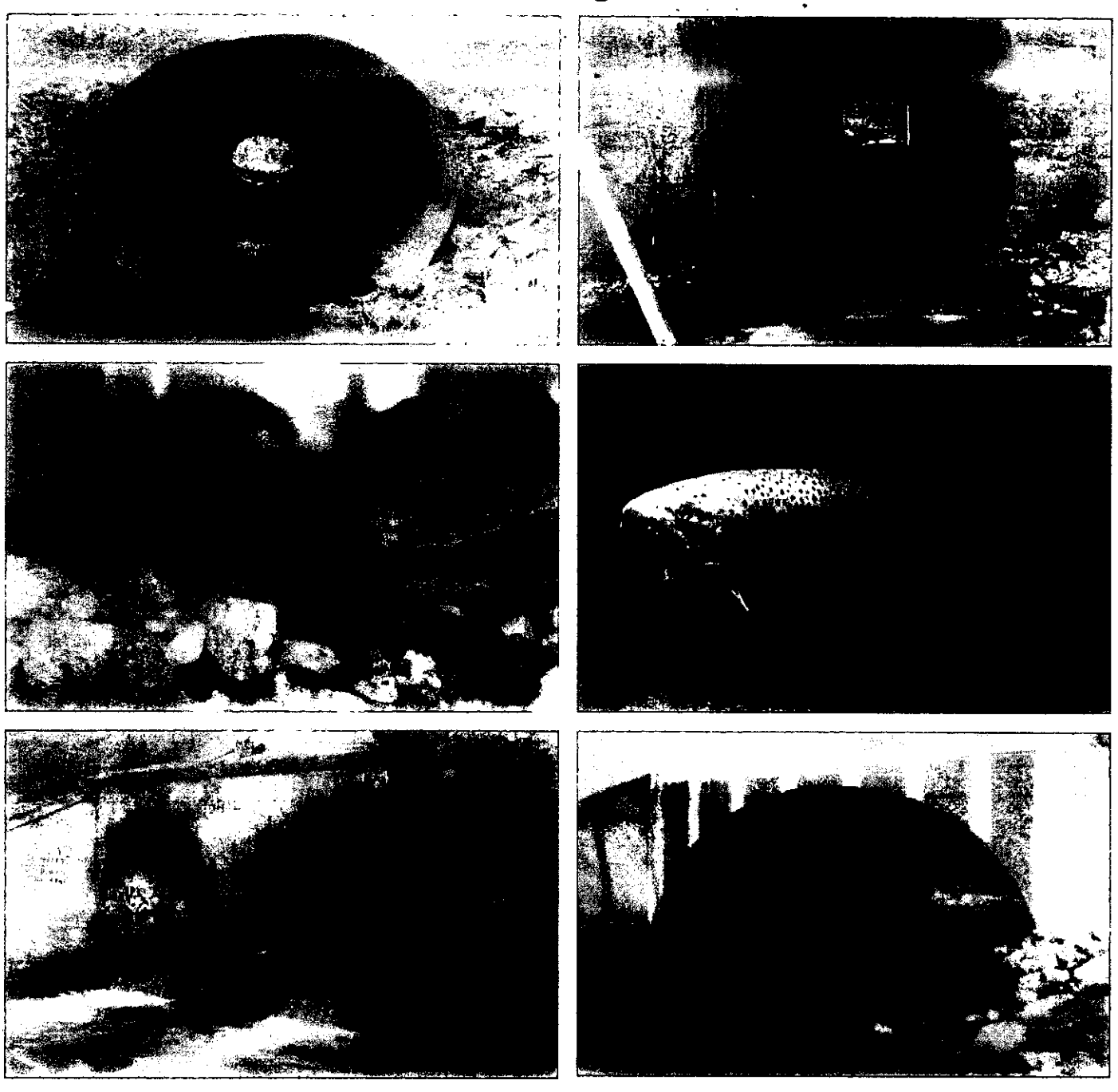
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Inland Fisheries Division
Habitat Conservation and Enhancement Program

Stream Crossing Guidelines



February 26, 2008

I. INTRODUCTION

Inland Fisheries Division (IFD) Habitat Conservation and Enhancement (HCE) staff have been assessing fish passage and instream habitat needs at stream crossings across Connecticut since the late 1980's. The program was created in part to ensure that fish and other aquatic life as well as aquatic habitat needs would be effectively addressed during municipal, State and Federal regulatory permit review processes. These stream crossing guidelines are intended to provide government agencies, non-profit environmental groups and private landowners with the best technical guidance available to ensure unimpeded fish passage for resident and anadromous fishes and to minimize construction related impacts.

Guidelines focus primarily on fish and fish passage, but incorporating the suggested practices will also benefit other wildlife. This document is not intended to be a technical design manual. Readers should consult specific guidance documents provided by municipal, State, or Federal regulatory offices having permitting authority over a stream crossing project. Also, scientific and technical manuals produced by other agencies, including those of the States of Vermont (VDFW 2005), Washington (WDFW 2003), Oregon (Robison et. al. 1999) and California (CFGD 2003) can provide additional guidance on fish passage design and related issues.

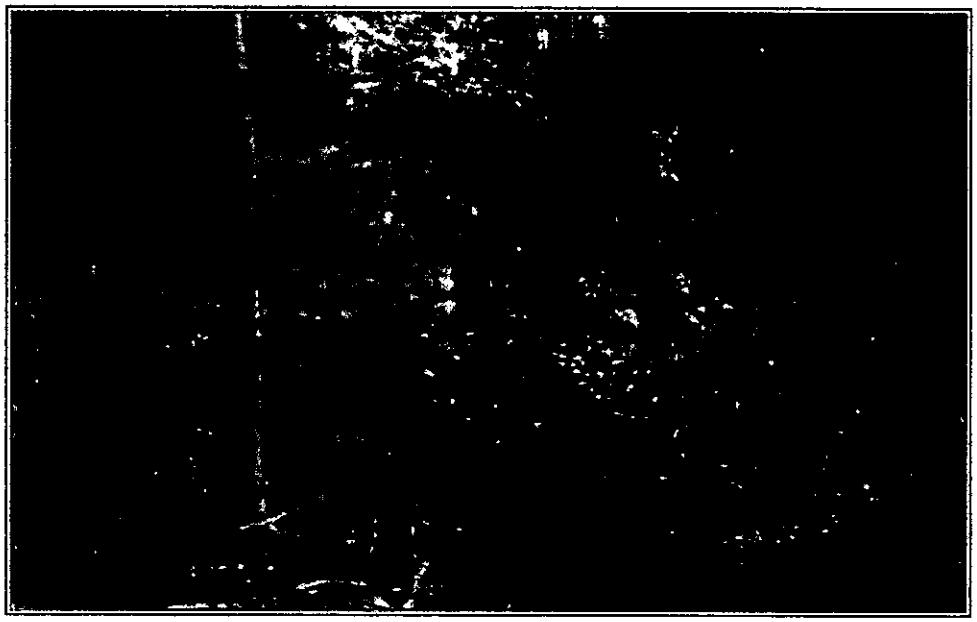


Figure 1. Example of small stream in Connecticut that supports a fish community.

Along a stream continuum, stream flow, hydrology, physical habitat and water quality are factors that determine which fish species are present in a watershed and the abundance and diversity of those species. While Connecticut citizens may readily recognize the negative effects of existing dams on fish passage, many may not be aware that stream crossings, particularly culverts, can permanently block or seasonally impede upstream fish passage.

Fish passage needs are often unrecognized on small watercourses. Small streams account for most of the total stream miles within any watershed (Jackson 2003) with an estimated 70% of stream channel in the United States being comprised of small, headwater streams (Leopold et al. 1964). Many small streams in Connecticut support fish populations, often times a single

species such as native brook trout (Figure 1). Many "problem" or impassable stream crossings were installed before environmental regulations were in place to review stream crossing designs and before there was a full understanding of the negative impacts to fish passage. Consequently, fish populations can become "fragmented" and unable to reach critical spawning, nursery, feeding, or seasonal refuge habitats that are important to the completion of various life history phases. The fragmentation of stream habitat and fish populations can adversely impact fish community diversity, fish population levels and fish survival. The following section describes common steam crossing problems observed in Connecticut.

II. COMMON STREAM CROSSING PROBLEMS

➢ Perched Culverts

The most common stream crossing problems in Connecticut are perched culverts that are situated above the elevation of the stream bottom at the culvert outlet (downstream end) that present obvious physical barriers to upstream fish passage (Figure 2). Perched culvert conditions are the result of improper installation or are created over time by years of excessive scour and erosion of the streambed at the culvert outlet. Freeze-thaw conditions can also lead to culvert perching.

Figure 2. Example of culverts perched above streambed.

➢ Shallow Water Depth

Another common problem are culverts that create shallow water or sheetflow conditions, especially during seasonal low flow periods (Figure 3). Thus, fish cannot swim through these structures due to insufficient water depths.

➢ Excessive Water Velocity

Excessive water velocities can occur within the main body of a culvert at the inlet/outlet sections. Velocity problems are typically observed within smooth bottom concrete box culverts that do not contain natural streambed substrates and lack channel roughness. Excessive velocities or hydraulic jumps can sometimes occur in culverts placed at improper slopes. Many fish species may not be able to pass through culverts with excessive velocities due to exhaustion (Figure 4).

Figure 3. Example of shallow water conditions in a concrete box culvert.

➢ **Debris accumulation**

Debris accumulation is another condition that can block fish passage. Accumulation of debris most often occurs at undersized culvert or multiple culvert situations, usually at the culvert inlet (Figure 5). Debris blockage can cause damage to the crossing structure or possibly lead to flooding. If debris forms a logjam comprised of large woody debris (LWD), which is defined by biologists as logs with a minimum diameter of 4 inches and a minimum length of 6 feet, it may be possible to remove the logjam and re-introduce portions of LWD downstream of the roadway crossing where it does not present any hazard. Refer to Inland Fisheries Division management guidelines within the LWD Factsheet that can be obtained at the DEP website, http://www.ct.gov/dep/lib/dep/fishing/restoration/largewoodydebrisfactsheet.pdf.

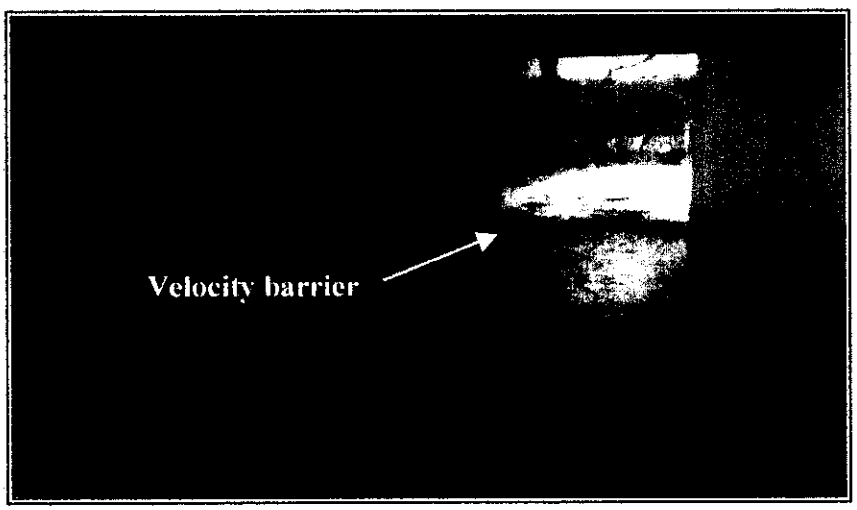


Figure 4. Example of excessive water velocities resulting in a barrier to fish passage.

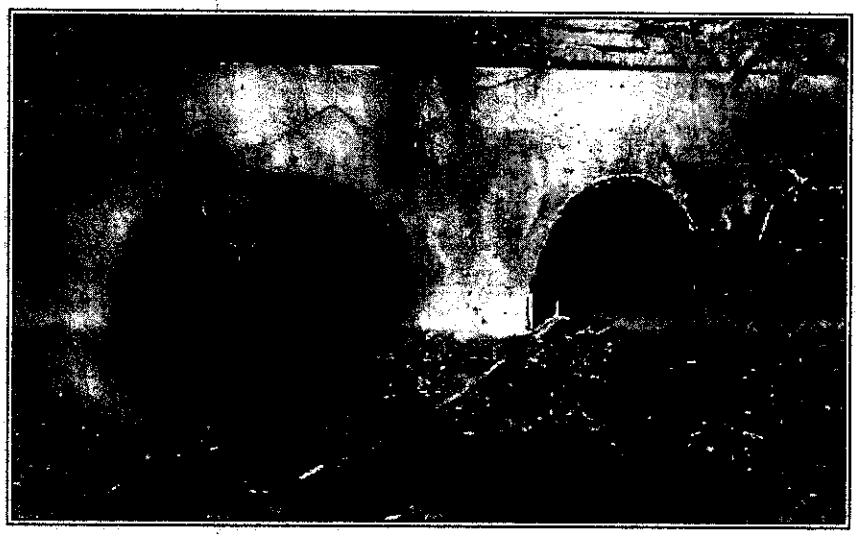


Figure 5. Debris blockage at culvert inlets that blocks fish passage.

III. STREAM CROSSING GUIDELINES

Fish species in Connecticut streams vary greatly in size, and many adult fishes, e.g., blacknose dace, longnose dace and tessellated darter never exceed 4 inches in length. Thus, when designing fish passage at road crossings, consideration must be given to the entire fish community, not just the larger stream fish such as trout and white sucker.

Many of the standards in these guidelines have been adopted from and are consistent with U.S. Army Corps of Engineers Connecticut Programmatic General Permit guidance. Refer to http://www.nae.usace.army.mil/reg/ctpgp.pdf for more details relative to general permit requirements and also contact the DEP Inland Water Resources Division for permit guidance.

Figure 6. Clear span bridges and bottomless arch culverts are preferred stream crossing structures.

For new or replacement stream crossing projects, the Inland Fisheries Division (IFD) typically recommends the installation of **clear span bridges** or **bottomless arch culverts** for the crossing of perennial watercourses (Figure 6). These structures are "fish passage friendly" since they do not create barriers or impediments to fish migration and they best preserve physical instream habitats. Intermittent watercourses are evaluated for fish passage needs based upon the potential for seasonal utilization of the watercourses by fish.

In certain situations, the IFD has accepted the installation of culverts for stream crossings. However, several modifications to culvert design may be required to ensure fish passage and maintenance of aquatic resource integrity. The modifications recommended are as follows:

- **SINGLE CULVERT**
  The invert of a box culvert should be set no less than 1 foot below the existing streambed elevation. This installation technique is referred to as a sunken or embedded culvert. The invert of a round culvert less than 10 feet in diameter should be set 1 to 2 feet below the existing streambed elevation. For round pipe greater than 10 feet in diameter, the culvert invert should be set a minimum of 20% of the pipe diameter below the streambed elevation.

- **MULTIPLE CULVERTS**
  Multiple culverts are discouraged where design criteria can be met with a single culvert. For multiple culvert situations, one or more of the culverts should be installed as per the guidelines for single culverts (Figure 7). Deflectors may need to be installed in the stream to concentrate low streamflows into and through the recessed culvert. Recessed culvert(s) should be installed in the thalweg or deepest section of the channel and be in alignment with the low flow channel.

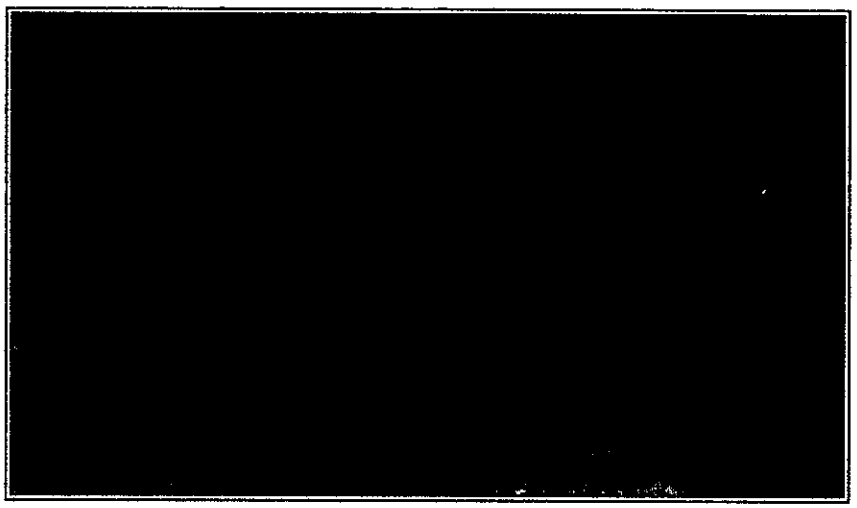


Figure 7. Culvert on left is sunken 1 foot below grade. Culvert at right, installed "at grade" accommodates high stream flows.

- **GRADIENT**
  The culvert gradient should be no steeper than the streambed gradient upstream or downstream of the culvert matching the overall stream gradient as closely as possible. Gradient for sunken culverts should not exceed 3%. Bottomless arch culverts or clear span bridges should be utilized in all cases where gradient exceeds 3%.

- **ALIGNMENT**
  Culvert alignment should be similar to that of the stream and not placed at a skew. This will ensure proper water conveyance and will protect against excessive channel erosion or scour.

- **LENGTH**
  Culvert length should be as short as possible. Vertical headwalls rather than fill slopes are recommended at the culvert inlet and outlet to reduce the total culvert length (Figure 8). Narrowing and lowering the roadway along with steepening embankments can also help reduce culvert length.

- **WIDTH**
  The culvert should have a width that spans an area 1.2 times the bankfull width of the stream. In Connecticut streams, bankfull width equates to the channel width wetted at the 1.5 to 2 year storm frequency flow. This standard also applies to arch (bottomless) culverts.

- **CORRUGATED CULVERTS**
  Corrugated culverts are preferred over smooth culverts since the corrugations create a roughness that aids in the retention of streambed material. Metal culverts are least preferred due to longevity concerns with rusting.

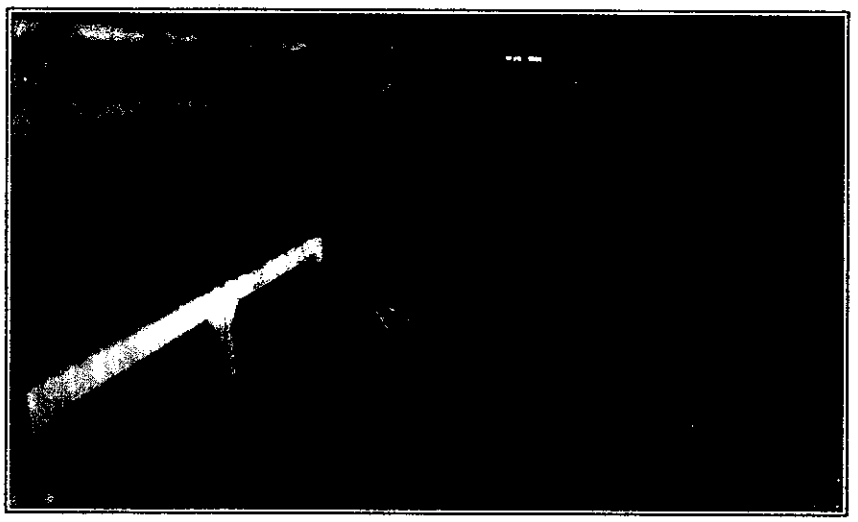


Figure 8. Example of vertical headwater that reduces length of culverts.

➢ **OPENNESS RATIO**

The culvert should have an Openness Ratio of ≥ 0.25. The Openness Ratio (OR) is calculated by dividing a culvert's cross sectional area (height x width) by its length. All measurements are in meters.

Embedded Culverts: $OR = \frac{[(\text{Cross-sectional culvert area pre-embedded}) - \text{Embedded area}]}{\text{Culvert length}}$

Arch Culverts (bottomless): $OR = \frac{\text{Height x Width}}{\text{Length}}$

➢ **PRESERVATION OF STREAMBED SUBSTRATES**

Native streambed material excavated for culvert placement should be stockpiled and replaced within the culvert following its installation. (Figure 9). Streambed material should be replaced in a manner replicating the original stream cross section with a well-defined low flow channel contiguous with that existing in the stream.

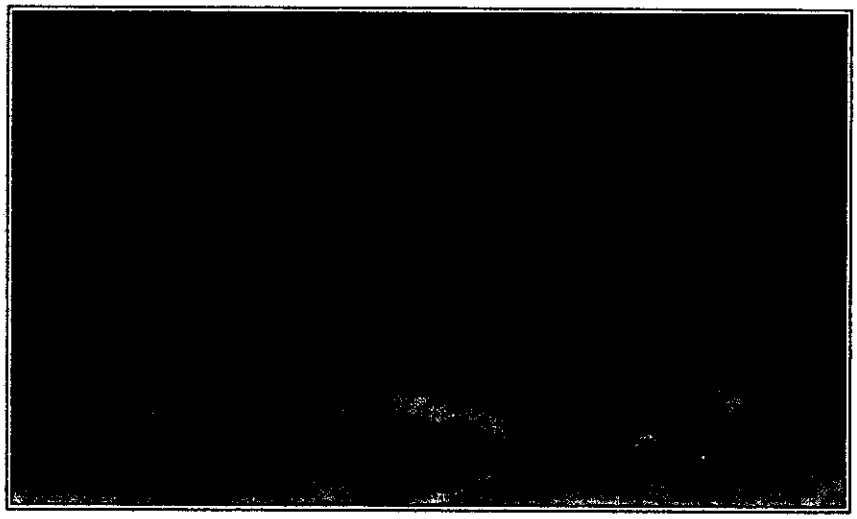


Figure 9. Streambed materials stockpiled for installation within sunken culverts.

IV. OTHER STREAM CROSSING AND HABITAT CONSIDERATIONS

In addition to offering recommendations for structure design, the IFD has developed the following measures to enhance and protect aquatic habitats and resources.

➢ **SEASONAL CONSTRUCTION WINDOWS**

Stream crossing construction projects can severely degrade stream fish habitat and water quality through the production of excessive turbidity and sedimentation levels. Negative impacts of sedimentation to fisheries resources have been well documented (Cordone and Kelley 1961; Reiser and Bjornn 1979; Ritchie 1972). Also, certain construction activities can prevent or delay the migratory movements of resident riverine and anadromous fishes through a project site. Consequently, seasonal construction windows, defined as "time periods during which construction should occur" are often recommended during times of the year when it is easier to control soil erosion and sedimentation and fewer fish are undergoing migrations.

Appropriate construction windows are typically determined on a case-by-case basis, but the following two windows are most often recommended.

1. INLAND RESIDENT FISH CONSTRUCTION WINDOW

In inland waters, unconfined[1] instream construction activities associated with either bridge/culvert installation and rehabilitation projects should only be **allowed** from the period **June 1 through September 30**, inclusive (Figure 10). Conversely this means a prohibition of unconfined instream construction activities from October 1 through May 30. Cofferdam installation may be allowed outside this window if construction techniques do not involve streambed excavation or sheetpile installation. This construction window pertains to perennial streams only. The use of construction windows to protect intermittent streams will be made on a case-by-case basis and their ability to seasonal support fish populations. Contact HCE fisheries biologists for guidance.

A June 1 through September 30 construction timeframe can be utilized as an effective measure for mitigating construction related disturbances for the following reasons: (1) it protects the spawning, egg incubation, and fry development periods of most resident fishes, (2) it does not interfere with seasonal migratory periods of resident fishes, and (3) it limits construction activities such as dewatering, excavation, trenching, and cofferdam placement to the period of low streamflow which coincides with the historic seasonal low rainfall period in Connecticut. In addition, during the June 1 through September 30 low flow period, erosion control measures are most effective and sediment transport can be more easily confined within the immediate construction area.

2. ANADROMOUS FISH CONSTRUCTION WINDOW

In both the tidal portions of rivers and streams and inland waters, elevated suspended sediment concentrations and sound levels produced by certain construction activities may prevent or delay spawning migrations of anadromous fish. The term anadromous refers to a species that lives in the ocean and returns to freshwater to spawn. Species of concern are alewife and blueback herring (collectively known as river herring), American shad and Atlantic salmon. Activities of particular concern are underwater pile driving, demolition of structures such as bridge piers using hoe rams and unconfined excavation and filing. All of these activities may affect the movement of fish through the project site[2]. Preventing migration would result in a complete failure of fish to spawn upstream of the site. If fish could not spawn anywhere below the site, it would cause the loss of an entire year class of fish that would have been produced in the stream. Delaying migration could reduce spawning stress, resulting in the production of fewer fish than would have been expected.

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[1] Unconfined is defined as work not contained within a cofferdam or similar type water exclusion structure.

[2] Although outside the scope of this document, it should be noted that occasionally a project may require the use of equipment or methods that can generate pressure waves sufficient to injure or kill fish, such as the use of high energy pile drivers to drive large support piles, high energy hoe rams for demolition, and blasting. If a contractor requests to use these during a sensitive period, HCE staff recommend a plan be developed and submitted for review and approval that details how impacts to fish will be avoided or acceptably minimized.

Collectively, spawning migrations of river herring, American shad and Atlantic salmon occur between March 1 and June 30. Therefore to protect all of these migratory species, unconfined instream construction activities associated with either bridge/culvert installation and rehabilitation projects should only be **allowed** from **July 1 to February 28th**, inclusive[3]. Conversely this means a prohibition of unconfined instream construction activities from March 1 through June 30 (Figure 10).

Since the migratory period of each anadromous species is different and may vary from stream to stream and only one or two species occur in some streams, an appropriate construction window should be determined on a case-by-case basis and will depend upon: (1) location of the project, (2) which species are known to migrate through the project area, (3) the timing of migration in the system, and (4) the type of construction activities and manner in which they are conducted. IFD Habitat Conservation and Enhancement staff can be consulted to assist with determining the best construction window to protect anadromous fishes.

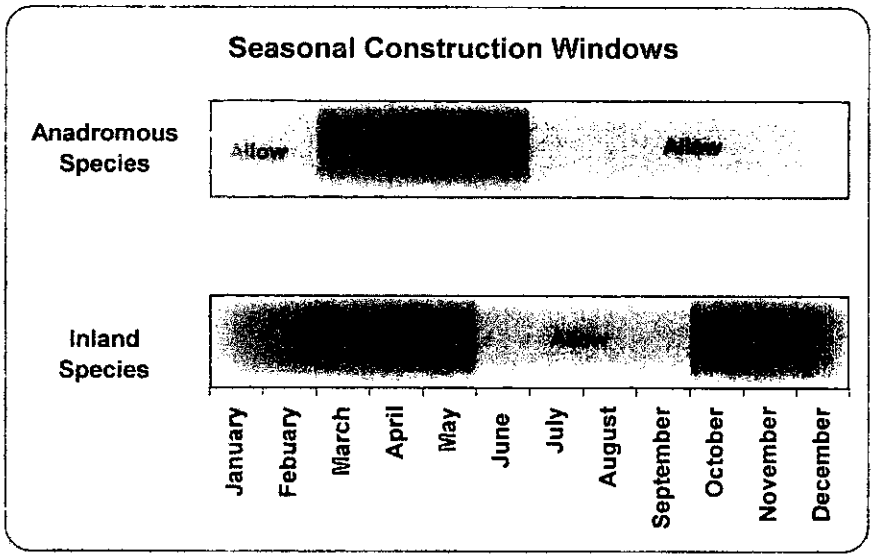

Figure 10. Recommended seasonal construction windows for inland and anadromous fish. *Note that the allowable unconfined work window in streams supporting both anadromous and inland fishes is restricted to the period from July 1 through September 30.*

➢ EROSION AND SEDIMENT CONTROLS

All appropriate erosion and sediment controls should be established prior to and be maintained through all phases of construction. Stream crossing projects should adhere to soil and erosion control best management practices as outlined in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Manual (DEP Bulletin 34).

➢ SCOUR PROTECTION

The placement of scour protection measures should be minimized to the fullest extent possible and should match overall stream gradient as closely as possible. The

[3] Note that for projects in the freshwater portions of streams, where the June 1 through September 30 window might be appropriate, a modification of the window might be necessary if the stream supports a spawning run of one or more anadromous species.

placement of riprap in streams for scour protection is discouraged. If scour protection is required within the streambed, it is recommended that the surface layer of natural streambed substrates should be scraped from the existing streambed, saved and then placed back as a top layer over a "sublayer" of riprap. Typically, this top layer of substrates should be no less than 12 inches in depth. This strategy can satisfy both engineering concerns for scour protection as well as fisheries concerns for preserving and maintaining the habitat benefits of natural streambed substrates. In addition, it is recommended that cross sectional and longitudinal profiles of the channel protected for scour should match pre-construction profiles.

➢ RIPARIAN ZONE PROTECTION

Riparian vegetation disturbed during construction should be re-established in a timely manner upon project completion. The species of vegetation selected for reestablishment should be native to the immediate watershed and be non-invasive. Refer to the Connecticut Native Tree and Shrub Availability List for more information. This list is available on the DEP website at http://www.ct.gov/dep/lib/dep/wildlife/pdf_files/habitat/ntvtree.pdf. Where possible, retaining walls should be utilized in lieu of fill slopes along roadway approaches to stream crossing structures to minimize riparian habitat loss.

➢ HABITAT MITIGATION

Instream habitats can often be lost or modified due to culvert placement. For example, placement of a culvert within spawning habitats can directly impact fish population levels. As a consequence, HCE fisheries biologists assess habitat losses and alterations associated with stream crossings and may recommend installation of instream habitat enhancement structures such as rock vanes, rootwads or boulders to offset or minimize instream habitat impacts. Refer to Maryland Waterway Construction Guidelines Manual for a thorough description of some habitat mitigation practices (MDEWA 2000).

➢ FISHING ACCESS

Stream crossing locations can be popular areas for angling, especially on streams stocked with trout. Often times angler parking access is only available through informal pull-off areas along the roadside. Stream crossing replacements that include roadway improvements may also include the installation of guardrails, which will permanently block off these informal parking areas. While the IFD acknowledges the need for roadway and public safety, it is recommended that roadway improvement design plans consider the retention or improvement of public fishing access.

V. CULVERT RETROFITS

Existing culverts that are not scheduled for replacement but which block fish passage can sometimes be modified or retrofitted to provide effective upstream fish passage. There are several retrofit options that can include gradient control weirs, interior baffles/weirs and even the installation of a fishway. Gradient control weirs are usually constructed with large boulders (Figure 11). They are typically placed downstream of the culvert outlet and are used to back-up water through a culvert or reduce an excessive drop at a culvert outlet. Care must be exercised to ensure that gradient control weirs do not block fish passage during low flows. Baffles or weirs can be used to facilitate fish passage by creating a series of pools with drops to increase water depth and decrease water velocities (Figure 12). There are several different

baffle configuration designs (Robison et. al. 1999, VDFW 2005). Baffles can increase debris clogging and accumulation and therefore require periodic maintenance. Installation of an engineered fishway can be utilized where the above retrofit options are not viable (Figure 13). Culvert retrofit design can be complicated and will usually require the services of a qualified civil engineer as well as review by HCE fisheries biologists. Culvert retrofits are never a substitute for full replacement and in some cases, full replacement can be more cost effective.

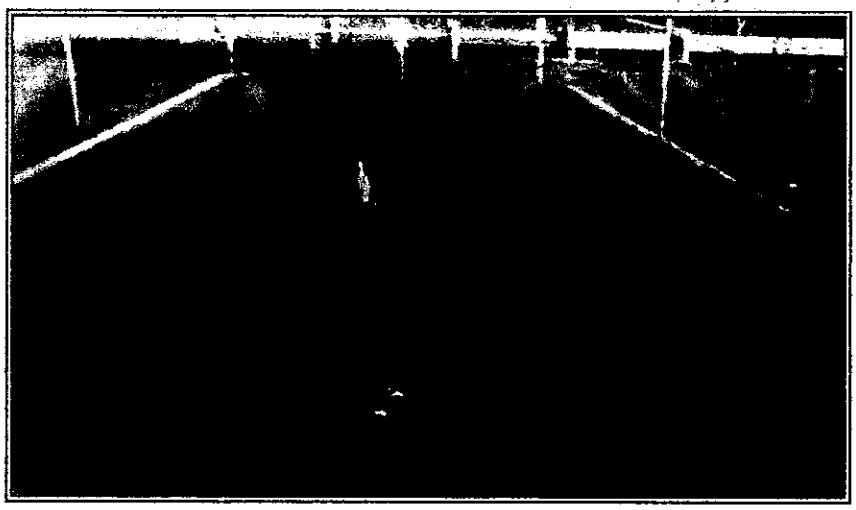

Figure 11. Example of boulder weir installed at outlet to create backwater into a culvert.

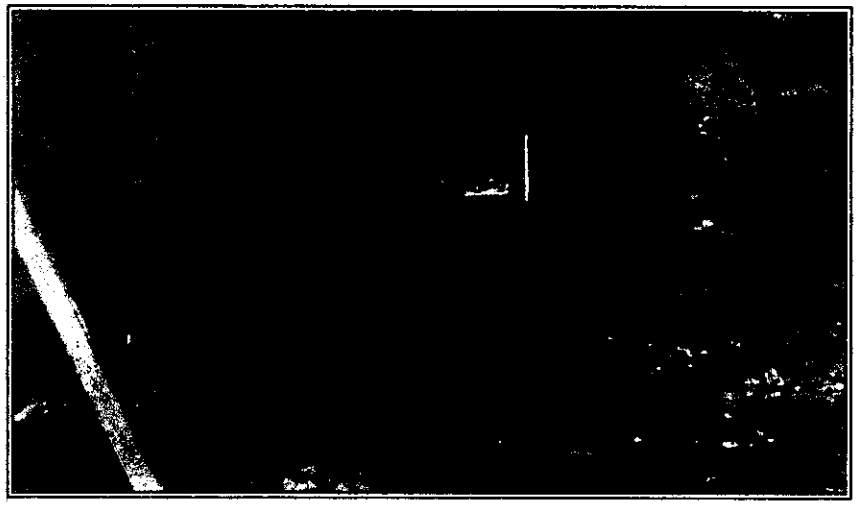

Figure 12. Example of concrete weir system.

Figure 13. Example of fishway installed within a culvert.

CONCLUSION

While this publication provides general stream crossing guidance, each stream crossing project may present certain challenges that have not been discussed. This document is not meant to be a technical design manual. Refer to the several design manuals that have been cited for more technical/engineering information, many of which are available on the internet. HCE staff are available to provide technical guidance relative to fish passage requirements for stream crossings; refer to contact information below.

CONTACT INFORMATION

Technical Guidance
Bureau of Natural Resources
Inland Fisheries Division
Habitat Conservation and Enhancement Program
Hartford Office: 860-424-3474
Eastern Connecticut: 860-295-9523
Western Connecticut: 860-567-8998
Coastal Connecticut: 860-434-6043

Regulatory Guidance
Bureau of Water Protection and Land Reuse
Inland Water Resources Division
Environmental Analysis Section: 860-424-3019

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New England District, U.S. Army Corps of Engineers, Regulatory Division
Openness Ratio Spreadsheet

- Openness Ratio (OR) is calculated by dividing a culvert's cross-sectional area by its length: OR = x-sec area ÷ length
- Along with other criteria, the MA PGP, General Condition 21, states that to qualify for the Category 1 (non-reporting):
  1. New permanent stream crossings must have an OR ≥.25

     OR =.25 = $\frac{\text{(x-sec area)}}{\text{culvert length}}$ or OR =.25 = $\frac{\text{[(x-sec culvert area pre-embed) - embedded area]}}{\text{culvert length}}$

  2. Round culverts must be embedded at least 25%
- The chart below provides the diameter needed to meet the .25 OR for various culvert lengths, accounting for the embedded area, when embedding 25%. All calculations must be done in meters. The conversion to feet is provided.
- The Corps uses the .25 OR as a guide for Category 2 projects reviews.

Required Diameter for .25 OR & 25% Embedment					
Length		Required Open Area		Required Diameter	
(FT)	(M)	(FT^2)	(M^2)	(FT)	(M)
6	1.83	4.92	0.46	2.79	0.85
8	2.44	6.56	0.61	3.23	0.98
10	3.05	8.20	0.76	3.61	1.10
12	3.66	9.84	0.91	3.95	1.21
14	4.27	11.48	1.07	4.27	1.30
16	4.88	13.12	1.22	4.56	1.39
18	5.49	14.76	1.37	4.84	1.48
20	6.10	16.40	1.52	5.10	1.56
22	6.71	18.04	1.68	5.35	1.63
24	7.32	19.68	1.83	5.59	1.70
26	7.93	21.32	1.98	5.82	1.77
28	8.54	22.96	2.13	6.04	1.84
30	9.15	24.60	2.29	6.25	1.91
32	9.76	26.24	2.44	6.45	1.97
34	10.37	27.88	2.59	6.65	2.03
36	10.98	29.52	2.74	6.85	2.09
38	11.59	31.16	2.90	7.03	2.14
40	12.20	32.80	3.05	7.22	2.20
42	12.80	34.44	3.20	7.39	2.25
44	13.41	36.08	3.35	7.57	2.31
46	14.02	37.72	3.51	7.74	2.36
48	14.63	39.36	3.66	7.90	2.41
50	15.24	41.00	3.81	8.07	2.46

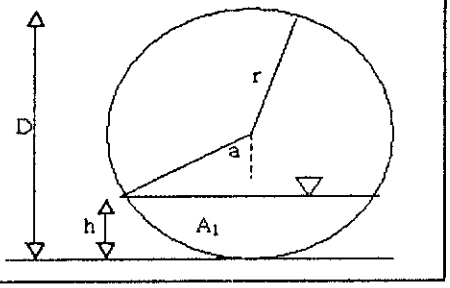
Derivation

1. The MA PGP, Category 1 requires:
   * 25% culvert embedment (=.25 x culvert diameter)
   * .25 openness ratio

2. Embedded area calculated as follows:

$$A_1 = \frac{D^2}{4}\left[a - \frac{\sin(2a)}{2}\right]$$

$$a = \cos^{-1}(1 - h/r)$$



Notes:
   * a is in radians
   * a = 60° = 1.05 radians, if h =.25D
   * A_1 = embedded area

3. OR =.25 = $\frac{\text{[(x-sec culvert area pre-embed) - embedded area]}}{\text{culvert length}}$

where:
   * x-sec area = $\pi D^2 / 4$
   * embedded area for 25% embed = $.62D^2/4 = (A_1)$
   * culvert length = L

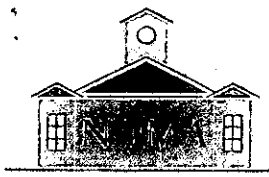
Therefore:

$$.25 = \frac{\pi D^2/4 \; - \; .62D^2/4}{L}$$

or

$$D = .63L^{1/2}$$

1/4/2006



New Hampshire Municipal Association

Submission to the Committee on Public Works

3 March 2011

Relative to HB 621

NHMA believes the stream crossing rules adopted by DES in 2010 violate Article 28-A of the NH creating an unfunded mandate "caused by the modification of an existing program that results in increased local expenditures **without the consent** of the municipality or the provision of funding to accomplish the purpose."

NHMA also believes that DES exceeded its statutory authority by relying on an agreement between the US Corps of Engineers and itself to promulgate these rules rather than specific authority granted it by the General Court. RSA 482-A 11 contains no reference to "stream crossings."

The following handout materials, numbered 1-5, are excerpt from their original documents which speak directly to those concerns:

No. 1: Submission by DES to JLCAR, No. 2009-108 clearly states:

1) "***No federal mandate.***"
2) "To the extent a political subdivision installs or replaces a stream crossing... ***they may have increased costs.***" JLCAR staff (and NHMA) pointed out to DES that this constituted a violation of article 28-a.

> Article 28-A of the NH Constitution, unfunded mandate caused by the modification of an existing program that results in increased local expenditures **without the consent** of the municipality or the provision of funding to accomplish the purpose.

No. 2: Submission by DES to JLCAR, No. 2009-109 clearly states:

1) "***No federal mandate.***"
2) "To the extent a political subdivision installs or replaces a stream crossing... ***they may have increased costs.***" JLCAR staff (and NHMA) pointed out to DES that this constituted a violation of article 28-a.

No. 3: Programmatic General Permit Extract, Paragraph 21, Waterway /Wetland Work and Crossing, subparagraph (c) "All temporary and permanent crossings of rivers, streams, brooks, etc (Here on referred to as "streams") shall conform to the "New Hampshire Stream Crossing Guidelines" ***when the State has adopted these guidelines as regulations.*** The Corps shall review projects under the Minor/Major or IP review procedures if conforming to the Guidelines is impractical. The Guidelines typically require bridge spans, open bottom

25 Triangle Park Drive • PO Box 617 • Concord, NH 03302-0617 • Tel. 603.224.7447 • NH Toll Free 800.852.3358 • Fax 603.224.5406
e-mail: governmentaffairs@nhlgc.org • Web site: www.nhlgc.org

arches or embedded culverts. Bridge spans are generally preferred." Subparagraph (e) states "***Only maintenance or replacement of serviceable crossings with an exact replica crossing (size, material, elevation, etc.) in the same footprint with no expansion or change in use/circumstance is considered as a maintenance project***, and therefore may proceed as a Minimum Impact Project. ***Any deviation deems the crossing as "new."*** Note: The State of NH's maintenance provisions differ from the Corps and will likely require reporting and written authorization from the State."

No. 4: US Army Corps of Engineers, Programmatic General Permit, Appendix B. "Information typically required for stream crossing projects:

- PE stamp on all perennial stream projects ***when required by the State***."

No. 5: NH Stream Crossing Guidelines, University of NH, May 2009

- III. Guidelines for New Stream Crossing, (a) vii. Structure Width, page 14 "***Culverts typically should be no less than 6 (six) feet.*** Six feet is the minimum width needed to properly construct stream simulation; the inside of culverts smaller than this are to small to access and construct the streambed."
- IV. Guidelines for Stream Crossing Structure Replacement, (a) General Considerations, page 29. "***Replacement crossing structures should follow the design guidelines for new stream crossing structures.***"

No. 6: Number of Road Miles Whose Maintenance is the Responsibility of Municipalities Represented by Members of the Committee on Public Works

JAN 20 2010

2/16 N

Final Proposal No. 2009-108

COVER SHEET FOR FINAL PROPOSAL

Date Filed: 1-20-10

#1.

Notice Number 2009-108 Rule Number Env-wt 303, 304, 501, 506, 801, 803, 804 -various sections and paragraphs

1. Agency Name & Address:

Department of Environmental Services
29 Hazen Drive
P.O. Box 95
Concord, NH 03302-0095

Substantive comments p. 1-4 + p. 8 (on the FIS and Part I, Acf. 28-a)

2. RSA Authority: RSA 482-A: 11

3. Federal Authority: N/A

4. Type of Action:

- ☐ Adopt
- ☒ Amendment
- ☐ Repeal
- ☐ Readoption
- ☒ Readoption w/amendment

5. Short Title: Amendments relative to Stream Crossings

6. Contact person for copies and questions:

Name:	Mary Ann Tilton	Title:	Assistant Bureau Administrator
Address:	Department of Environmental Services 29 Hazen Drive P.O. Box 95 Concord, NH 03302-0095	Phone #:	271-2929

7. Yes ☐ No ☒ Agency requests Committee legal counsel review and delayed Committee review pursuant to RSA 541-A:12, I-a

8. The rulemaking notice appeared in the Rulemaking Register on **July 24, 2009, extension granted by letter dated December 18, 2009.**

SEE THE INSTRUCTIONS--PLEASE SUBMIT 2 COPIES OF THIS COVER SHEET AND 2 COPIES OF THE FOLLOWING:
(and numbered correspondingly)

9. The "Final Proposal-Fixed Text", including the cross-reference table required by RSA 541-A:3-a, II as an appendix.

10. The full text of the RSA passage granting rulemaking authority.

11. Yes ☐ N/A ☒ Incorporation by Reference Statement(s) because this rule incorporates a document by reference for which an Incorporation by Reference Statement is required pursuant to RSA 541-A:12, III.

12. Yes ☒ N/A ☐ The "Final Proposal-Annotated Text" indicating how the proposed rule was changed because the text of the rule changed from the Initial Proposal pursuant to RSA 541-A:12, II(e).

13. Yes ☐ N/A ☒ The amended fiscal impact statement because the change to the text of the Initial Proposal affects the original fiscal impact statement (FIS) pursuant to RSA 541-A:5, VI.

LBAO
FIS 09;113
07/15/09

Fiscal Impact Statement for Department of Environmental Services rules governing Amendments relative to Stream Crossings [Env-Wt 303.02 intro & new (p); Env-Wt 303.03 intro, new (n) & (o); Env-Wt 303.04 intro, (g)-(j), (n), (x)-(z), (ae) & new (ag); Env-Wt 303.05 intro, (a) intro & (f); Env-Wt 304.07; Env-Wt 501.02 new (e), Env-Wt 506 01 (a)(8) & new (c); Env-Wt 506.04 (c); Env-Wt 801.01; Env-Wt 801.03; Env-Wt 803.01 (a) intro, new (b), & (c) intro; Env-Wt 803.03; Env-Wt 803.05; Env-Wt 804.02]

1. **Comparison of the costs of the proposed rule(s) to the existing rule(s):**
   When compared to the existing rules, the proposed rules may have an indeterminable impact on costs to political subdivisions and independently owned businesses to the extent they install or replace a stream crossing.

2. **Cite the Federal mandate. Identify the impact on state funds:**
   No federal mandate, no impact on state funds. The proposed rules will align New Hampshire requirements with federal requirements under the State Programmatic General Permit issued by the US Army Corps that require construction projects provide for aquatic organism passage. The aligning of New Hampshire requirements to the federal requirements may result in a decrease in costs as applicants will not have to meet two separate sets of standards.

3. **Cost and benefits of the proposed rule(s):**

   A. **To State general or State special funds:**
      None.

   See comment on p. 8 to Part I, Art. 28-a statement.

   B. **To State citizens and political subdivisions:**
      To the extent a political subdivision installs or replaces a stream crossing and does not already design for the passage of aquatic organisms and anticipated flows, especially during storm events, they may have increased costs. The alignment of NH requirements with the federal requirements may result in a decrease in costs as applicants will not have to meet two separate sets of standards. There is no impact on state citizens.

   See comment on p. 8.

   C. **To independently owned businesses:**
      To the extent an independently owned business installs or replaces a stream crossing and does not already design for the passage of aquatic organisms and anticipated flows, especially during storm events, they may have increased costs. The alignment of NH requirements with the federal requirements may result in a decrease in costs as applicants will not have to meet two separate sets of standards.

Date and Time: **Tuesday, September 8, 2009, 6:00 p.m. to 8:00 p.m.**

Place: **Keene Public Library, Ruth Huntress Auditorium, 60 Winter Street, Keene, NH**

10. Fiscal Impact Statement (Prepared by Legislative Budget Assistant)

FIS # 09:113 , dated 07/15/09

See Attached.

11. Statement Relative to Part I, Article 28-a of the N.H: Constitution:

The rules do not create, modify, or expand any program in such a way as to require action by political subdivisions and so do not require any expenditures by political subdivisions. The rules thus do not violate Part I, Article 28-a of the N.H. Constitution.

(See comment on p. 8.

Comment to FIS

The fiscal impact statement (FIS) indicates that the proposed rules may have an indeterminable impact on costs to political subdivisions and independently owned businesses, but that there is no impact to state citizens. However, the rulemaking notice describes that the groups that may be affected by the rule include any individual or entity that needs to construct or maintain a stream crossing. Similarly, Env-Wt 303.04(z), (ae), and (ag) all suggest that there may be financial consequences to private citizens contrary to the FIS as a result of the proposed rules.

Comment to Part 1, Art. 28-a Statement

This Statement may be incorrect. There may be a violation of Part 1, Article 28-a because the FIS indicates a fiscal impact on political subdivisions. Also, see conflict with RSA 541-A:25, which also prohibits unfunded state mandates on political subdivisions, even if the function is one the political subdivision may legally choose not to undertake.

#2

2/17

Final Prop. 2009-109
Date Filed 1-20-10

COVER SHEET FOR FINAL PROPOSAL

Notice Number 2009-109 Rule Number Env-Wt 900

1. Agency Name & Address:

Department of Environmental Services
29 Hazen Drive
P.O. Box 95
Concord, NH 03302-0095

Substantive comments p. 8 and on p. 10-11 (to FIS + Part I, Art. 28-a Statement)

2. RSA Authority: RSA 482-A: 11
3. Federal Authority: N/A
4. Type of Action:
   - ☒ Adopt
   - ☐ Amendment
   - ☐ Repeal
   - ☐ Readoption
   - ☐ Readoption w/amendment

5. Short Title: Stream Crossings

6. Contact person for copies and questions:

Name: Mary Ann Tilton
Title: Assistant Bureau Administrator
Address: Department of Environmental Services
29 Hazen Drive
P.O. Box 95
Concord, NH 03302-0095
Phone #: 271-2929

7. Yes ☐ No ☒ Agency requests Committee legal counsel review and delayed Committee review pursuant to RSA 541-A:12, I-a

8. The rulemaking notice appeared in the Rulemaking Register on **July 24, 2009, extension granted by letter dated December 18, 2009.**

SEE THE INSTRUCTIONS--PLEASE SUBMIT 2 COPIES OF THIS COVER SHEET AND 2 COPIES OF THE FOLLOWING:
(and numbered correspondingly)

9. The "Final Proposal-Fixed Text", including the cross-reference table required by RSA 541-A:3-a, II as an appendix.

10. The full text of the RSA passage granting rulemaking authority.

11. Yes ☒ N/A ☐ Incorporation by Reference Statement(s) because this rule incorporates a document by reference for which an Incorporation by Reference Statement is required pursuant to RSA 541-A:12, III.

12. Yes ☒ N/A ☐ The "Final Proposal-Annotated Text" indicating how the proposed rule was changed because the text of the rule changed from the Initial Proposal pursuant to RSA 541-A:12, II(e).

13. Yes ☐ N/A ☒ The amended fiscal impact statement because the change to the text of the Initial Proposal affects the original fiscal impact statement (FIS) pursuant to RSA 541-A:5, VI.

LBAO
FIS 09:114
07/15/09

Fiscal Impact Statement for Department of Environmental Services rules governing Stream Crossings. [Env-Wt 900]

1. **Comparison of the costs of the proposed rule(s) to the existing rule(s):**
   When compared to the existing rules, the proposed rules may have an indeterminable impact on costs to political subdivisions and independently owned businesses to the extent they install or replace a stream crossing.

2. **Cite the Federal mandate. Identify the impact on state funds:**
   No federal mandate, no impact on state funds. The proposed rules will align New Hampshire requirements with federal requirements which may result in a decrease in costs as applicants will not have to meet two separate sets of standards.

3. **Cost and benefits of the proposed rule(s):**

   A. **To State general or State special funds:**
   None.

   See comments p. 10 & 11.

   B. **To State citizens and political subdivisions:**
   To the extent a political subdivision installs or replaces a stream crossing and does not already design for the passage of aquatic organisms and anticipated flows, especially during storm events, they may have increased costs. The alignment of NH requirements with the federal requirements may result in a decrease in costs as applicants will not have to meet two separate sets of standards. There is no impact on state citizens. ← See comment p. 10.

   C. **To independently owned businesses:**
   To the extent an independently owned business installs or replaces a stream crossing and does not already design for the passage of aquatic organisms and anticipated flows, especially during storm events, they may have increased costs. The alignment of NH requirements with the federal requirements may result in a decrease in costs as applicants will not have to meet two separate sets of standards.

(a) The applicant shall propose an alternative design only if installing the structure specified in the applicable rule is not practicable, as that term is defined in Env-Wt 101.69.

(b) To request approval of an alternative design, the applicant shall submit a written request to the department, accompanied by a technical report prepared by an environmental scientist or professional engineer that clearly explains:

(1) Why installing the structure specified in these rules is not practicable, which may include, but not be limited to, that site conditions preclude the installation of a structure allowed by the rules, or the cost of installing a structure as specified in the rules is grossly disproportionate to the overall purpose of the project;

(2) Why the proposed alternative design better meets the intent of retaining natural stream characteristics of the site; and

(3) How the alternative design meets the general design criteria specified in Env-Wt 904.01.

(c) For a new crossing, the department shall approve the proposed alternate design if:

(1) The report submitted pursuant to (b), above, demonstrates that adhering to the rules is not practicable; and

(2) The alternative design meets the general design criteria specified in Env-Wt 904.01.

(d) For a crossing being upgraded pursuant to Env-Wt 904.06, the department shall approve the proposed alternate design if:

(1) The report submitted pursuant to (b), above, demonstrates that adhering to the rules is not practicable;

(2) The modification to the existing crossing proposed by the applicant results in a stream crossing that more closely meets the specific design criteria; and

(3) The alternative design meets the general design criteria specified in Env-Wt 904.01.

(e) The department shall notify the applicant in writing of its decision on the request. If the request is denied, the notice shall specify the reason(s) for the denial. If the request is approved, the permit issued shall include such conditions as are needed to ensure that the project's impacts are minimized.

Comment to FIS

The fiscal impact statement (FIS) indicates that the proposed rules may have an indeterminable impact on costs to political subdivisions and independently owned businesses, but that there is no impact to state citizens. However, the rulemaking notice describes that the groups that may be affected by the rule include any individual or entity that needs to construct or maintain a stream crossing. Similarly, Env-Wt 904.02(a)(1) suggests that there may be financial consequences to private citizens contrary to the FIS as a result of the proposed rules.

Comment to Part 1, Art.28-a Statement

This Statement may be incorrect. There may be a violation of Part 1, Art. 28-a because the FIS indicates a fiscal impact on political subdivisions. Also, see conflict with RSA 541-A:25, which also prohibits unfunded state mandates on political subdivisions, even if the function is one the political subdivisions may legally choose not to undertake,

APPENDIX

Rule Section(s)	Statute(s) Implemented
Env-Wt 900	RSA 482-A:1 & 3; RSA 482-A:11

21. Waterway/Wetland Work and Crossings

(a) All temporary and permanent crossings of waterbodies and wetlands shall be suitably culverted, bridged, or otherwise designed to withstand and to prevent the restriction of high flows, to maintain existing low flows, and to not obstruct the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.

(b) Aquatic Life Movements. No activity may substantially disrupt the necessary life-cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water.

(c) All temporary and permanent crossings of rivers, streams, brooks, etc. (here on referred to as "streams") shall conform to the "New Hampshire Stream Crossing Guidelines" when the State has adopted these guidelines as regulations. The Corps shall review projects under the Minor/Major or IP review procedures if conforming to the Guidelines is impractical. The Guidelines typically require bridge spans, open bottom arches or embedded culverts. Bridge spans are generally preferred.

(d) The requirements to comply with the Guidelines in order to proceed as a Minimum Impact Project as stated in (c) above do not apply to the following:

i. Temporary crossings in place for less than 90 days (the requirements in (a) do apply). Temporary culverts must be embedded unless they're installed during low flow (Jul. 15 – Oct. 1), the appropriate culvert radius is 36 inches or less, and it's placed on geotextile fabric laid on the stream bed to ensure restoration to the original grade;

ii. Constructed drainage systems designed primarily for the conveyance of storm water or irrigation. Also, non-tidal drainage and irrigation ditches excavated on dry land are not Federally-regulated.

(e) Only maintenance or replacement of serviceable crossings with an exact replica crossing (size, material, elevation, etc.) in the same footprint with no expansion or change in use/circumstances is considered as a maintenance project, and therefore may proceed as a Minimum Impact Project. Any deviation deems the crossing as "new." Note: The State of NH's maintenance provisions differ from the Corps and will likely require reporting and written authorization from the State.

(f) Culverts shall be installed with their inverts embedded below existing streambed grade to avoid "hanging" and associated impediments to fish passage.

(g) Culverts at wetland and waterbody crossings shall be installed in such a manner as to preserve hydraulic connectivity, at its present level, between the wetlands on either side of the road. The permittee shall take necessary measures to correct wetland damage due to lack of hydraulic connectivity.

(h) Projects using slip lining (retrofitting an existing culvert by inserting a smaller diameter pipe), noncorrugated plastic pipes, High Density Polyethylene Pipes (HDPP) or retrofit methods increasing flow velocity, are not allowed to proceed as a Minimum Impact Project, either as new or maintenance work.

(i) No projects involving open trench excavation in flowing waters are allowed to proceed as a Minimum Impact Project. Open trench excavation projects may qualify for the PGP if they are reviewed pursuant to the Minor/Major project review procedures and conditioned to protect the aquatic environment [work should not occur in flowing waters (requires using management techniques such as temporary flume pipes, culverts, cofferdams, etc.) and normal flows are

US Army Corps of Engineers
New England District

U.S. Army Corps of Engineers
Programmatic General Permit (PGP)
Appendix B - Required Information and Corps Secondary Impacts Checklist

In order for the Corps of Engineers to properly evaluate your application, applicants must submit the following information along with the DES Wetlands Bureau application or permit notification forms. Some projects may require more information. For a more comprehensive checklist, see www.nae.usace.army.mil/reg/Application_PlanGuidelines.doc. Check with the Corps at (978) 318-8832 for project-specific requirements. For your convenience, this Appendix B is also attached to the State of New Hampshire DES Wetlands Bureau application and Permit by Notification forms.

Required information for all projects:

- 8½"x11" plans: Locus map, plan views of the entire property and project limits with existing and proposed conditions. On each plan show the NGVD 1929 equivalent for the project's vertical datum with the vertical units. Do not use local datum.

Required information for Federal inland (Section 404) wetland/waterway fill projects:

- Complete the "Corps Secondary Impacts Checklist" provided on the following page;
- Each plan should show the ordinary high water (OHW) line in the absence of a contiguous wetland.
- National Wetlands Inventory Map(s) (www.fws.gov/nwi/) showing the impacted wetland system(s);
- For Minor/Major Impact Projects, delineate special aquatic sites (SAS) and special wetlands, including vernal pools [see General Condition (GC) 26].

Information typically required for stream crossing projects (perennial and intermittent unless otherwise specified):

- Rosgen classification for perennial streams. See Applied River Morphology, Dave Rosgen, 1996;
- PE stamp on all perennial stream projects when required by the State;
- Crossing impact analysis of hydraulic capacity, hydrogeomorphic compatibility, watershed size above a crossing, upstream and downstream direct and secondary impacts from a proposed crossing;
- Stream bank full, and bank dimensions, channel dimensions, extent of the floodplain prone area;
- Crossing impact assessment to wildlife and fisheries and aquatic organisms (pre- and post design) including direct and secondary impacts;
- Replacements: an analysis of current crossing compatibility, stability of upstream and downstream channel and bank, recent scour events, systems analysis on hydrology, ecological stability and sediment loading.

Required information for projects in tidal waters:

- Each plan should show the mean high water (MHW), mean low water (MLW), mean lower low water (MLLW), high tide line (HTL) or other tidal datum;
- Delineate special aquatic sites (SAS) and special wetlands (see GC 26);
- Show or state the size of the waterbody;
- Limits of any Federal Navigation Project (FNP) within 100' of the project area and State Plane Coordinates for the limits of the proposed work closest to the FNP;
- Volume, type, and source of fill material to be discharged into waters and wetlands, including the area(s) (in square feet or acres) of fill in wetlands and the areas below the HTL.

#5

UNIVERSITY *of*
NEW HAMPSHIRE

New Hampshire Stream Crossing Guidelines

May 2009

Therefore, although this information is useful, it should be used with an understanding of the limitations of the dataset and the conclusions drawn from the analysis. Simply applying this as a numeric standard for all crossings is not recommended given the amount of geomorphic variability in New Hampshire streams and rivers; however, this numeric value may be useful to those designing and constructing crossings and to those involved with reviewing applications for stream crossings.

Culverts **typically** should be no less than 6 feet and no more than 16 feet in diameter. Six feet is the minimum width needed to properly construct stream simulation; the inside of culverts smaller than this are too small to access and construct the streambed. For projects requiring a culvert 16 feet wide or greater, a bridge/span is likely more practical, but properly designed and constructed culverts may also be a solution in these cases. A stream with a 3 foot bankfull width requires, at a minimum, a culvert that is 6 feet wide at the streambed (3 feet times 1.2 plus 2 feet). A stream with a 12 foot bankfull width requires, at a minimum, a 16 foot wide culvert (12 feet times 1.2 plus 2 feet), or in other words, streams with a bankfull width less than 12 feet are culvertable while those 12 feet or wider typically should be a bridge/span.

viii. Embedding Structures

It is preferable for enclosed structures to be embedded, sloped, and aligned adequately to provide natural sediment transport, structure stability, and passage of water, organic matter and aquatic biota at all levels of flow. Stream stability, gradient, and flow magnitude highly influence the necessary levels of structure embedment. An appropriately embedded structure should have:

- Sufficient conveyance of water and sediment, with velocities suitable to maintain aquatic organism passage.
- Sufficient depth of material within the culvert to achieve stability of the culvert bed material comparable to that of the upstream and downstream channel.
- Sufficient depth of material to prevent dewatering and subsequent aquatic organism passage problems at any flow conditions.
- Sufficient embedment to account for long-term vertical channel adjustment anticipated for the adjacent streambed. In some cases site constraints may limit the degree to which a culvert can be embedded. In these cases, pipe culverts should not be used and pipe arches, open-bottom arches, or bridges should instead be constructed. The footing depths should be determined by the design engineer of record using scour analysis, geotechnical investigations, and/or other appropriate methods.
- Sufficient conditions to ensure adequate ecosystem connectivity and accessibility to both sides of the stream crossing (River and Stream Continuity Partnership 2006).

For general guidance, the following are often used to determine the minimum embedment depths for crossings:

lessens the dramatic ecosystem impacts resulting from these culverts. Each individual stream crossing replacement should be evaluated as an opportunity to improve the overall connectivity of a watershed.

Stream crossing upgrades require careful planning and are not in all instances simply the replacement of a culvert with the same size or larger structure. Even as undersized crossings block the movement of organisms and material, over time rivers and streams adjust to the hydraulic and hydrologic changes caused by these structures, often leading to aggradation on the upstream side of the culvert and the increased potential of crossing failing due to this. Increasing the size of a crossing structure can destabilize the stream and cause head cutting, the progressive degradation of the stream channel, upstream of the crossing. There also may be downstream effects such as increased sedimentation. Crossing replacement can result in the loss or degradation of wetlands that formed upstream as a consequence of constricted flow. In heavily developed watersheds, undersized culverts may impede water to the point that storm flows are diminished in the watershed as a whole. Before replacing a culvert or other crossing structure with a larger structure, it is essential that the replacement be evaluated for its impacts on:

- Downstream flooding.
- Upstream flooding.
- upstream and downstream habitat (instream habitat, wetlands, riparian buffer, riparian areas).
- Potential for erosion and headcutting.
- Channel dimension, pattern, and profile in the vicinity of the structure.
- Sediment transport capacity.
- Stream vertical and lateral stability.

The replacement crossing will need to be carefully designed in order to maximize the benefits and minimize the potential for negative consequences resulting from the upgrade. In some instances, stream restoration may be needed in addition to culvert replacement in order to restore river/stream continuity and facilitate fish and wildlife passage. Culvert replacement may require attendant structures such as cross vanes, W weirs, and log vanes to ensure stream stability at that location. As with the design and construction of new crossings, the recent publication on stream simulation for stream crossings can be effectively utilized for the design and construction of replacement crossings (USDA Forest Service 2008b). Other tools specifically related to fish passage at culverts are available from a consortium of stakeholders (USDA Forest Service 2008a), from Maine (MEDOT 2004) and Vermont (Bates and Kirn 2008). These fish passage tools may provide fish passage for replacement culverts which are otherwise not impacting aquatic habitat or sediment and wood transport.

a) General Considerations

Replacement crossing structures should follow the design guidelines for new stream crossing structures (see Design Guidelines for New Stream Crossings section). p. 14
With stream crossing replacements, the stream should be surveyed beyond the impact area of the existing crossing, upstream and/or downstream, to where the natural stream

#6

House Committee on Public Works
Road Miles in Member Districts

MUNICIPALITY	ROAD MILES
Bartlett	45.96
Bedford	180.91
Bradford	48.2
Chatham	9.13
Chesterfield	71.43
concord	191.79
Conway	81.64
Easton	4.56
Freedom	43.07
Harts Location	1.05
Henniker	72.28
Hinsdale	30.31
Hooksett	74.28
Hudson	139.64
Jackson	20.41
Laconia	73.38
Landaff	16.18
Lincoln	7.39
Lisbon	39.3
Litchfield	61.84
Manchester	351.21
Monroe	15.76
Nashua	268.6
Ossipee	83.25
Pelham	93.5
Rollinsford	16.94
Salem	168.29
Sandwich	65.16
Somersworth	42.59
Sugar Hill	29.72
Tamworth	61.21
Waterville Valley	6.8
Winchester	58.64
Windham	94.8
	2,569.22
% OF TOTAL	**22.14%**

*** {MOTION ADOPTED}

14. DEPARTMENT OF ENVIRONMENTAL SERVICES
(a) OR 2009-108 Wetlands Programs Amendments Relative to Stream Crossings

VICE-CHAIRMAN PILOTTE: Can we move on to the -- what will probably be a little bit easier, and I say --

SEN. CARSON: I don't know.

VICE-CHAIRMAN PILOTTE: -- with tongue in cheek. With tongue in cheek. Objection response 2009-108 on the Wetlands Programs, Amendments Relative to Stream Crossings, and, Attorney Eaton, the letter that was addressed to the Committee which was passed out also cc'd Miss Olsen. Miss Olsen, have you received a copy of the letter from Representative Spang --

SUSAN OLSEN, Government Affairs Advocate, Local Government Center: No, I have not.

VICE-CHAIRMAN PILOTTE: -- from the Committee of Resources, Recreation and Development?

MS. OLSEN: No, I did not.

VICE-CHAIRMAN PILOTTE: We had a few extra copies of that letter, so if you could work with that, please. Okay. Um -- now, we looked at those, and I think we remember some of the issues at

hand dealing with sizes of -- replacement costs and what type of culverts are to be replaced by what types of culverts.

ATTORNEY LUCAS: I'm going to call the department.

REP. PATTEN: Yeah. See where they are.

ATTORNEY LUCAS: They're out here.

VICE-CHAIRMAN PILOTTE: Okay. So they're in our workroom.

REP. PATTEN: They're working. That works. And it's a very interesting thing in two rules almost together we have input from the Policy Committees that are in total opposition to each other.

REP. BOYCE: Yeah.

REP. PATTEN: Maybe getting input from the Policy Committee is not a good idea. I'd like to let the Policy Committees know that, so maybe they need to talk to one another. I just would like to bring that up.

REP. TAYLOR: Well, one Policy Committee didn't really hear this bill and study it or anything else.

VICE-CHAIRMAN PILOTTE: Okay. And, Attorney Eaton, I believe we have some extra copies of that, and I think the agency might want to take one of those. Okay. So, Attorney Lucas, if you could do what Attorney Morrell did a few minutes ago and go

through this and remind us of all of our approbise in this -- -- in this issue.

ATTORNEY LUCAS: I think I'm hoping to narrow rather than broaden the issues.

VICE-CHAIRMAN PILOTTE: Okay.

ATTORNEY LUCAS: Gretchen, are you going to take both proposals as one?

(Ms. Hamel nods her head.)

ATTORNEY LUCAS: There are different -- -- two different rules here, 2009-108 and 2009-109, and because the issues are so intertwined and the facts are essentially intertwined and the same, we're going to do it as one proposal.

VICE-CHAIRMAN PILOTTE: Okay. Any objections from the Committee members on that?

REP. PATTEN: No. I don't know how we're going to crack it, but that's the way you guys crack it.

VICE-CHAIRMAN PILOTTE: Okay. Thank you.

ATTORNEY LUCAS: We've reviewed both rules -- -- um -- -- namely, the staff of JLCAR, and all the changes that we proposed have been accommodated, leaving two issues at this juncture. One is the fiscal impact statement, and the second is sort of a joint issue now. It relates to both the New Hampshire Constitution, Part I, Article 28-a, which is the unfunded mandate statute, and also a comparable statute dealing with rules, and that is

RSA 541-A:25. And I'd like to take a couple of minutes and just comment on those two matters and then see where things go.

The fiscal impact statement indicates that the proposed rules may have an indeterminable impact on cost, both to subdivisions and independently-owned businesses but no impact to State citizens. However, the rulemaking notice describes that the groups that may be affected by the rule include any individual or entity that needs to construct or maintain a stream crossing. Similarly, Env-Wt 303.04 (z) (ae) and (ag) on pages four and five are referring to a single-family building lot - -

VICE-CHAIRMAN PILOTTE: Now, this would be on 108.

ATTORNEY LUCAS: This is - - this is 108.

VICE-CHAIRMAN PILOTTE: Thank you.

ATTORNEY LUCAS: I'm sorry. It's page nine on 108.

REP. PATTEN: Page nine on the objection response or on our - -

ATTORNEY LUCAS: Objection response. The response to the preliminary objection.

REP. PATTEN: Page nine. Okay. Thank you.

ATTORNEY LUCAS: All right. My apologies. There are similar notations on page 13 of rule 2009-109, but they are basically the same as what I'm

talking about now. In any event, the rule on — — or rules on pages four and five are referring to a single-family building lot suggests that there may be financial consequences to private citizens contrary to the FIS as a result of the proposed rule.

The other comment deals with the New Hampshire Constitution, Article 28-a, and RSA 541-A:25. Excuse me. The statement that there are no violations of 28-a or the rule may be incorrect. There may be a violation of Part I, Article a — — or Article 28-a of the Constitution because the fiscal impact statement reflects the fiscal impact on political subdivisions. Also, see RSA 541-A:25, which also prohibits the imposition of unfunded State mandates on political subdivisions even if the function is one that the political subdivision may legally choose not to undertake.

The Department of Environmental Services' response in its cover letter on pages three and four argues that Article 28-a and RSA 541-A:25 are not violated because the rules do not require new stream crossings, and, two, neither Article 28-a nor 541-A:25 require the political subdivisions be allowed to knowingly install a deficient crossing just because the up-front costs are lower. The issue in number one is arguable, but in number two, while the rules, in the view of the department, may be necessary for public health, safety and the environment, the question for amended rules on existing crossings is one of authority to mandate them on political subdivisions. The department would lack the authority to require compliance by political subdivisions if they necessitate

additional local expenditures for existing crossings unless the State pays for them or the political subdivision votes to do so. It may be unwise and increase the liability of the public subdivision to not follow such rules under Article 28-a and 541-A:25. That would be the political subdivision's choice to make.

VICE-CHAIRMAN PILOTTE: So are we hearing that on the -- at least on the political subdivisions, the rules would say you should do it this way, but if the political subdivision decides not to follow those rules -- um -- it's okay?

ATTORNEY LUCAS: Well, I mean it exposes the subdivisions to -- um -- claims and litigation for not complying with the standards enunciated by the department.

VICE-CHAIRMAN PILOTTE: I think Health and Human Services did not remove Mr. Hobson's horse from the room.

REP. PATTEN: Mr. Hobson's horse. I'm going to have to Google that.

VICE-CHAIRMAN PILOTTE: Hobson's horse is the -- Hobson's choice --

REP. SCHMIDT: Choice. There we go.

VICE-CHAIRMAN PILOTTE: -- is to settle a debt. You say well, you can have the first horse. It's in the barn, except that doggone horse has got everything wrong with it that you could possibly have go wrong with it.

REP. PATTEN: All right.

VICE-CHAIRMAN PILOTTE: So that, you know, I do agree that I owe you a horse. Do you want this one? And that's your choice. It's the only horse I got. Not always nice, but - -

ATTORNEY LUCAS: Not everything is wrong with these rules, but there is a - - there is a conflict of power in truth.

VICE-CHAIRMAN PILOTTE: Okay. Please.

GRETCHEN HAMEL, Administrator, Legal Unit, Department of Environmental Services: Gretchen Hamel, Administrator of the Legal Unit for the Department of Environmental Services, and with me is Rene Pelletier, who is the Assistant Director for the Water Division at DES. And I just have a question before I launch into my remarks, which is do you want us to address the 28-a issue? I know there are other people who would like to testify. And then come back up to address those other issues or would you like us to defer to the public testimony and then address everything at once?

VICE-CHAIRMAN PILOTTE: Well, why don't we address the issues that have been identified by staff first, and then - - not leave the room, and then we'll have you get back to address any of the issues that are brought up by others.

MS. HAMEL: That's fine.

VICE-CHAIRMAN PILOTTE: If it's okay with you.

MS. HAMEL: That's fine. Yes. I just – –

REP. PATTEN: Need to know.

MS. HAMEL: Need to know. We have addressed the – – the two issues that have – – or the issues that have been identified by Attorney Lucas in our letter responding to the – – um – – preliminary objection. I think it is – – I don't think it's debatable or I wouldn't have recommended that we say it in the letter that municipalities and other political subdivisions have an unfettered right to trash the environment and put public health at risk. I just don't see that anywhere in our Constitution. They may not like the possibility of having to spend a little more money up–front – – um – – and if you think that is really a violation of Article 28–a, then you will vote accordingly, but I think you have to balance that against what the rules do, what the rules have been modified to accommodate, and then make your decision.

The rules as revised, based – – as part of our response to this objection contain provisions now for repairing or rehabilitating existing crossings. They contain provisions for replacing Tier 1 or Tier 2 crossings – – um – – that were specifically incorporated – – um – – I think primarily at the urging of the New Hampshire Department of Transportation, but certainly it applies to any crossing that exists not just State–owned crossings. The existing provisions in the rules for – – um – – maintaining roadway crossings – – um – – with no permit at all and no fee at all are being maintained. That allows anyone to replace a

crossing with a – – replace a culvert with a culvert up to twice as big up to 36 inches in diameter. Again, without a permit, without a fee, without any review at DES. I haven't – – um – – heard of any concrete example of where this is going to raise an unfunded mandate – – um – – or provoke an unfunded mandate at – – at the State level. I also want to make sure that – – that we all understand that the requirements that are reflected here are – – reflect the Federal requirements that are going to apply whether or not we adopt these rules.

The Army Corps of Engineers has jurisdiction over all the crossings we're talking about that are covered by these rules. They have a very transparent process now because we have the State programmatic general permit, and if a permit is issued that complies with the requirements that they've already agreed to – – the Corps has already agreed to under the PGP, then they typically won't pull it out for separate permitting, although they do still retain the jurisdiction to do that. So if these rules go away, the same standards are going to apply to political subdivisions. And they'll just be dealing with a Federal agency instead of with us.

VICE-CHAIRMAN PILOTTE: Um – – Miss Hamel, I remember a discussion on having large culverts, but I also remember someone making a tremendous case on a different type of culvert that was bottomless or something or other being mandated or required where the cost differential was substantial and where the gentleman, and I don't recall who he represented, said it could be addressed by just even making the culvert larger, which would still allow for sediment to settle in the culvert and not – – not impede

the – – the – – um – – the migration of wildlife or fish specifically or amphibians. Could you address that, please?

MS. HAMEL: I would be happy to. On page eight of the rule piece of our objection response.

VICE–CHAIRMAN PILOTTE: Page eight of your rules of the objection response.

MS. HAMEL: For OR 2009–109.

VICE–CHAIRMAN PILOTTE: Okay.

REP. PATTEN: Page eight.

VICE–CHAIRMAN PILOTTE: Page eight of your response or – –

MS. HAMEL: Of the rules that were attached to the response letter.

REP. PATTEN: Objection response 2009–109, and we're on page eight. We have two of these.

MS. HAMEL: At the top it says, "Added text in bold italics. Deleted text struck through." OR 2009–109.

VICE–CHAIRMAN PILOTTE: Okay. Yeah.

REP. PATTEN: There is an objection response to 09 and an objection response to 08. What she is talking about right now is the 09 on page eight.

MS. HAMEL: On page eight. And specifically

Env-Wt 904.02, which starts at the top of that page, and if you read down to the middle of the page, there are annotations. The paragraph used to be paragraph (d). It's now been made to be (b) (3). That was where the requirement was that there be open-bottom with stream simulation or closed-bottom with stream simulation. All of those requirements have been deleted. So a Tier 1 crossing is somebody wants to put in a straight bore culvert. They're allowed to under these rules as long as they're meeting the general design criteria which are the considerations of passage of water and aquatic life.

VICE-CHAIRMAN PILOTTE: Okay.

MS. HAMEL: So I believe that issue for Tier 1 crossings has gone away.

VICE-CHAIRMAN PILOTTE: Okay.

MS. HAMEL: For Tier 2 crossings -- I'm trying to figure out where they are -- um -- you can use any type of structure, but if it's closed-bottom, we want to see the stream simulation for a new Tier 2 structure.

VICE-CHAIRMAN PILOTTE: You want to see the stream --

MS. HAMEL: Simulation.

VICE-CHAIRMAN PILOTTE: Okay.

MS. HAMEL: And that's actually what all of the guidelines and BMPs call for. They call for installing basically a larger culvert and then --

but sinking it so that the bottom part of it is filled with natural streambed material.

VICE-CHAIRMAN PILOTTE: Okay.

MS. HAMEL: That's for new. And then replacement can be what was there or better.

VICE-CHAIRMAN PILOTTE: Okay. Thank you. Questions? Okay. Yes, Representative Schmidt.

REP. SCHMIDT: I just wanted to say that I think that the only issue is not whether -- whether the Newfounds or -- are entitled to trash the environment because they aren't. The law forbids them to do that, but if they did it and subjected it, they would fully subject themselves to subsequent lawsuits and punitive actions. The only question is whether -- whether the rules impose something on them that 28-a forbids, and the fact that the Feds have jurisdiction here and require exactly the same thing, to me, is a more persuasive argument that you are merely implementing that which the Federal rules require, and the question is then whether it's a reasonable proposal to which there should be no objection. So we're going to hear from the public whether they agree with that, but not that the municipalities have a right to trash the environment.

VICE-CHAIRMAN PILOTTE: Which is probably a poor choice of words.

REP. PATTEN: We have heard that before.

VICE-CHAIRMAN PILOTTE: But it was a little bit

stronger, just a bit stronger. Okay. Please don't leave the room. Could I ask for a Jasen Stock, please, and he's from New Hampshire Timberland Owners Association.

REP. KIDDER: Is that Stock or Stark?

MR. STOCK: Stock.

VICE-CHAIRMAN PILOTTE: O-C-K.

JASEN STOCK, Executive Director, New Hampshite Timberland Owners Association: I think I put on my card less than two minutes, and I certainly anticipate adhering to that. For the record, my name's Jasen Stock. I'm the Executive Director of the New Hampshire Timberland Owners Association, and I wanted to speak to these rules specifically as they relate to forest management. Um -- they do have an impact on -- or they do -- um -- impact the rules for stream crossings as they relate to forest management, and I should also note wetlands crossings as well. If you're in the woods, and you're crossing a brook to access the backside of your wood lot, you need to put in a crossing device of some sort, these rules -- that's where these rules apply.

Specifically, the -- the 303.04 and the changes reflected in there -- um -- I've -- so my comments are going to be just restricted to that section, and I -- I'm coming today and speaking in support of them. We had worked with the department quite a bit in developing the rules, again, specific to the forestry operations and looking at some -- what I'll call in-woods operations and how these

rules apply, both in terms of theory but also in practice, and had a couple field trips out into the forest and looked at a real world situation, and -- um -- the department, I think, did a very good job at accommodating what occurs in the forest and modified the rules accordingly so that -- and really -- and in the process clarified a number of things that are in the current rules today that have always been kind of ambiguous and, as a regulated community, difficult for us to interpret, and so I just wanted to come and voice our support. And the rules -- and I guess I'll reference. There was a letter, March 3rd, 2010. This was the last time -- I think it was the last time the department had met with you folks and made some conditional -- and part of their request for conditional approval they made -- it was that version of the rules that I speak of specifically.

VICE-CHAIRMAN PILOTTE: That is the conditional approval request on this, on 108.

MR. STOCK: So I'm not going to belabor the point. If the Committee would like specifics, I can point to specific instances in the rules where things were modified, but I wanted to just come today and just point that out, that the rules have implications certainly on the municipal perspective, the D.O.T., but there also is this in-woods piece, and as it relates to that piece, we are -- we are quite satisfied and pleased with what is being presented.

VICE-CHAIRMAN PILOTTE: Thank you. Any questions for Mr. Stock? Okay. Could I ask a Gary Abbott from the Associated General Contractors, and

Mr. Abbott is speaking in opposition.

GARY ABBOTT, Executive Vice President, The Associated General Contrators of New Hampshire, Inc.: I'm going to pass this out to everyone.

VICE-CHAIRMAN PILOTTE: Asking for changes is -- generally I'm not happy with them.

MR. ABBOTT: For the record, my name is Gary Abbott. I'm the Executive Vice President of The Associated General Contractors of New Hampshire. I come to you today mostly in regards to section 109 that you're considering, but I've handed out -- -

VICE-CHAIRMAN PILOTTE: Now, we're on 108 now. We have agreed to work on both 108 and 109 with the department. Do we -- are we willing to -- -

SEN. CARSON: Yeah.

VICE-CHAIRMAN PILOTTE: -- address questions on 109 at this point?

SEN. CARSON: Yeah.

VICE-CHAIRMAN PILOTTE: Okay.

MR. ABBOTT: Great. Thank you. I've handed out two pieces of paper. As these rules have developed, I have gone to our organization which represents commercial and industrial contractors, subcontractors suppliers, and the paper that you've got was presented to the Public Works Committee when they held those two meetings. Um -- it was at the

second meeting. It became apparent to us to make sure that everyone involved in the rules understood that the cost of going to an open-box bottom culvert was much more expensive than it was, and we have the people that install those, and they gave me the numbers anywhere from four to six times the
— —

VICE-CHAIRMAN PILOTTE: Mr. Abbott, the objection response, because I believe Miss Hamel addressed that question earlier — —

MR. ABBOTT: Okay.

VICE-CHAIRMAN PILOTTE: — — in response to my question.

MR. ABBOTT: Okay.

VICE-CHAIRMAN PILOTTE: Did her answer address your concerns or not?

MR. ABBOTT: No, it didn't.

VICE-CHAIRMAN PILOTTE: The fact that these have been, you know, tweaked? No?

MR. ABBOTT: No.

VICE-CHAIRMAN PILOTTE: Okay.

MR. ABBOTT: I guess that's where I'm coming to.

VICE-CHAIRMAN PILOTTE: Okay.

MR. ABBOTT: Our organization had concerns of the high cost of -- -- basically what these rules do, from our perspective, is they put in place a much higher standard to meet from the get-go. And the out is an alternative design that's accepted if you have trouble meeting that, either cost or you want to put in something that is less expensive that currently is being allowed today.

So that leads me to the second piece of paper which is under 109. So what we're saying today is that if you're going to go forward with what's presented as you have, then we're looking at it in a very technical manner to look for issues that we may have with those technical pieces, and that's what this second piece does. We went through those rules for the alternative design. So if we have a project that we think does not have to have the open-box type culvert, which is going to be very costly, we want to propose another design. What we found is some inconsistencies, so on that 904.09, which is page 13 of the document that you just looked at with -- -- with Gretchen that had a previous -- -- when you go to 904.09 -- --

VICE-CHAIRMAN PILOTTE: So you're talking about the objection response?

MR. ABBOTT: That's correct.

VICE-CHAIRMAN PILOTTE: Okay. On page what?

MR. ABBOTT: Page 13.

VICE-CHAIRMAN PILOTTE: Okay. Thank you.

REP. SCHMIDT: It's referenced in that. It's referenced in here.

SEN. CARSON: Yep.

VICE-CHAIRMAN PILOTTE: Oh, okay. Sorry.

MR. ABBOTT: Yeah. And basically what I'm going to do is just go through that. What happens is we're finding some technical difficulties that if you're going to have an alternative design, but in that alternative design under those rules they refer back to the design standards of having an open box. So we find a dilemma in the sense that some of that criteria needs to be modified, so it's a very simple request that the criteria that is okay, and there are items that are okay, those should be met, but those criteria that you can't meet, and I'll just -- I'll use as an example, and as you can see in the -- if you go to -- um -- 904.05 --

REP. PATTEN: It's on page 10 of 09 objection response.

MR. ABBOTT: That's correct. And on page 10 it starts to relate to like the stream crossing guidelines from the University which have a lot of items which deal with the open box. Item number (c), provide a vegetated bank on both sides of the water course, if it's for that area in which we're going to put in a culvert that doesn't have the open box, that may not apply. But, clearly, (d), the natural alignment and gradient of a stream channel to accommodate the flows, we would not be able to meet. So -- and (f), to simulate a natural stream channel, if we're going to put in a pipe instead of

an open box, we think those items -- and what we're really asking for is that, you know, somewhere in the alternative design that it makes clear that those criteria that make it an open box not be applied. The next item is page seven.

REP. SCHMIDT: Can I -- can I --

VICE-CHAIRMAN PILOTTE: Please.

MR. ABBOTT: Sure.

REP. SCHMIDT: Gary, on those issues that you're raising, have you had discussions with the department with regard to this or is this the first time --

MR. ABBOTT: No, I have provided it to the department --

REP. SCHMIDT: Okay. Thank you.

MR. ABBOTT: -- this week. On page seven of this same item, under 90 -- 904.01 under (f), restore watercourse connectivity and where, of course I'm dealing with contractors and applicants who are trying to do a project, and when we read this we're not so sure exactly what this means, if it was -- previously was disrupted by human activity. So I'm coming into a new project, and it's basically asking me to build something that may not have been there, and I don't know for how long it's been blocked or to what extent. So we're finding a lot of subjectivity in that item to just what exactly would satisfy that requirement. We recognize what's being done, but we're also looking

at this as the standard to meet if you were trying to do it as an applicant.

VICE-CHAIRMAN PILOTTE: Hmm.

MR. ABBOTT: On page 12, 904.08, very similar -- I'm sorry -- 904.08 on page 12?

VICE-CHAIRMAN PILOTTE: Right.

SEN. CARSON: Yep.

REP. SCHMIDT: We got it.

MR. ABBOTT: Okay. What I -- both -- first, I'll direct you to (b) even though my paper directs you to (a). (B), again, refers to the 904.05 as we had talked about in the first one, and under (a) it has that same stream crossing guideline, so if there is a technical issue, it's also under this one as well.

And the last one on page 13 -- um -- definitely, as an applicant, "maximum extent" -- um -- we already have a standard which is practicable, but those words in front of the two sections that have "maximum extent practicable," not so sure what that standard is. It sounds like a different standard than the definition of practicable, and I'm not sure what that is intended to mean from an applicant's point of view. So those are -- those are technical -- because I also have, in case you want, under 101.69, which is not part of the rule -- it's part of the definitions of practicable, there are three items that you have to -- that they take into consideration, cost,

existing technology and logistics in light of overall project purposes. So those three standards are already in practicable, but I'm not really sure what "maximum extent" — — I know the department has told me it's guidance for the applicant, but I represent applicants, and we're not sure what that means, so.

REP. PATTEN: Can I just have a follow—up on that?

VICE—CHAIRMAN PILOTTE: Yes.

REP. PATTEN: Gary, you have those three things that go to practicable. Where are those? You just read them. Are they in these rules?

MR. ABBOTT: I'll just pass it out because I did make copies.

REP. PATTEN: Okay.

(Mr. Abbott passes out a document.)

MR. ABBOTT: It's under the definitions of the Wetlands rules already because practicable had to be defined under other sections of the statute. So it's under 101.69, but it's not in your packet. It's part of the regular rules.

REP. PATTEN: All right. Thank you. Can I just ask one more?

VICE—CHAIRMAN PILOTTE: Please.

REP. PATTEN: Has the department — — have you

– – apparently there is no – – in those Wetlands rules, there is no definition for "maximum extent."

MR. ABBOTT: Not that I could find.

REP. PATTEN: Okay. Thank you.

REP. SCHMIDT: Gary, you realize all the trees we're saving you're killing.

VICE–CHAIRMAN PILOTTE: Okay. Other questions? Did I see a question from you, Representative Kidder?

REP. KIDDER: No.

VICE–CHAIRMAN PILOTTE: No. Okay.

REP. SCHMIDT: Again, if I could just follow up?

VICE–CHAIRMAN PILOTTE: Please.

REP. SCHMIDT: And you've discussed all these things with the department?

MR. ABBOTT: Well, what happened is is I've met with Rene Pelletier earlier this week, reviewed this section, because here – – here's what I've come to grips with. One, the rules are going through. You're gonna have this higher standard, so I have to make sure, from our point of view, that the alternative process is really there and available to us to use in those cases. So we looked at that alternative process. That became our focus this week is to look at the alternative process to make

sure there wasn't things in there that would stop the real -- -- the real use of the alternative process, because that is the -- -- if the cost is six times -- -- if your project is going to normally cost, under the current conditions, 20,000, and it's suddenly going to be 120,000, you want to be able to have that -- -- as that's been touted as why you would let these rules is that if you had a practicable issue, and it included costs, that it cost too much, this is the avenue you would take. So we just want to be sure if that's the avenue we take, with something that like today would be okay, and the department would be -- -- would review it, that those standards are in place, that it just doesn't loop you back to the same higher standard that you couldn't meet and be denied.

VICE-CHAIRMAN PILOTTE: Follow-up?

REP. SCHMIDT: Right. My question is whether all these issues that you've just raised with us are ones that you raised with the department, so that they will have some kind of a response, not on the fly but, rather, something they've been able to think through and as to each one of these issues.

MR. ABBOTT: They did respond to me on these issues.

REP. SCHMIDT: Um-hum.

MR. ABBOTT: But I think they were a quick response. I have -- -- I asked them in an E-mail to take a closer look at it, and that's how I left it Wednesday.

REP. SCHMIDT: Okay.

VICE-CHAIRMAN PILOTTE: Mr. Abbott, I have one question for you, and that is the issues you've addressed have been on 109. When we take a vote on these rules, I'm going to have to take a separate vote on 108 and 109. 108 you have no problems with.

MR. ABBOTT: Well, I think they're all -- I think you're correct in the sense that they are very similar and interconnected, so I -- as far as I see, but that's really up to you guys for your policy decision.

VICE-CHAIRMAN PILOTTE: But the issues that you flagged have been on 109.

MR. ABBOTT: That's correct.

VICE-CHAIRMAN PILOTTE: So my question is on 108, you have no specific --

MR. ABBOTT: I have no specifics like I do on 109.

VICE-CHAIRMAN PILOTTE: Thank you. Okay. No other questions? Okay. Could I ask Richard Roach, and Mr. Roach represents the U.S. Army Corps of Engineers.

RICHARD ROACH, U.S. Army Corps of Engineers, New England District, Regulatory Division: Good morning. I'm Richard Roach. I work for the U.S. Army Corps of Engineers, New England District in the Regulatory Division, and I deal with a lot of New Hampshire projects, often with New Hampshire D.O.T.

and often with municipalities through the infrastructure of projects. And I came up this morning to, again, exhort this group to support the stream crossing rules. I think it's very important that -- that the DES is sort of the primary contact on these issues. I think that the rules have been made clear, more flexible, and my fear is that if we don't have some rules adopted, we're going to have, more often than we would like, situations where resource agencies will ask the Corps of Engineers to intercede and try to force a situation where someone would do a bigger culvert than they would like, and we'll have to look at it individually and -- -- um -- -- subject a lot of people to a lot of difficulty.

It's going to be very hard for us to do that in a number of instances. It's going to be very frustrating for the D.O.T. and municipalities to have to have this sort of separate Federal permit. I mean we give a permit under the State program general permit. We generally give these permits, and I think in many instances where they appeal to us, while we may find that it's impracticable to do a larger culvert or a natural-bottomed culvert, but just the time and the difficulty of deciding that is going to be sort of frustrating. It seems to me it's a lot better for the streams and for the citizenry to have reasonable rules that would apply so that they can -- -- they can decide how to do things, and if they get their State permit, they don't have the Federal Government coming in and saying well, now we want to apply some higher standard which would be trouble for them and for us.

VICE-CHAIRMAN PILOTTE: Mr. Roach, one of the issues that we're going to be put to the mettle on

here — —

MR. ROACH: That's all right. That's why I came.

VICE-CHAIRMAN PILOTTE: We do have a section in our Constitution that says that the State cannot impose a standard on a municipality without paying for it. In many cases, and it happens frequently in the DES sphere, they're basically past rules of requirements at the Federal level where the agency has no input. You heard Representative — — Miss Hamel earlier say that if — — if an agency — — or if a municipality decided not to comply with the rules because of the 28-a issue, it was her understanding that your requirements — — or the Federal requirements would kick in, which are going to be just as stringent or more so. Is that true fact?

MR. ROACH: I think that in most cases is going to be true, that we're going to — — we're going to really be forced — — well, now, this is where — — where there's some real difference, where it matters, where it matters to the aquatic life and things like that. We're going to be applying standards that aquatic life have to get back and forth, but we do have under Executive Order 11988 a requirement not to exacerbate flood damages, so there's going to be a lot of pressure on us to — — to apply, you know, rather high standards, and we're not going to relent. And this is going to cause, I think, a lot of consternation on the part of municipalities, but the fact of the matter is there's going to be, you know, people tugging at us on both sides, and we're liable to say you need a permit, and here's — — here's what our standards

are, and they are the same as you've heard.

We have to permit the least damaging, practicable alternative, and we have to consider the cost and technology and things, but you could just imagine doing that on a case-by-case basis all over the place, pretty soon there would be a terrible backlog. I mean a lot of arguments about -- about whether -- what meets the standards. Those standards that you heard come out of the 404(b) guidelines, they are Federal rules, and they're the substantive rules for our permit decision-making, and we're going to hear from the Environmental Protection Agency that this is what you have to apply, so I really -- you know, I think that -- that municipalities and other State agencies are going to do better in dealing with their own State bureaucrats rather than Federal bureaucrats.

VICE-CHAIRMAN PILOTTE: But you wouldn't see it as trashing the environment?

MR. ROACH: No, I don't. I don't assume that the D.O.T. or -- or municipalities, you know, have hostility towards their environment. We all understand how critically important, you know, a good environment is to New Hampshire.

VICE-CHAIRMAN PILOTTE: Thank you. Representative Patten.

REP. PATTEN: Thank you, Mr. Chairman. The -- there's what -- the 404(b) guidelines, also talk about Tier 1 and Tier 2 crossings and streams --

MR. ROACH: No.

REP. PATTEN: -- or are you just on a Tier 3?

MR. ROACH: No. The guidelines apply to all our permit decision-making, so they're going to -- they would apply to anything that we decide we're going to take an individual look at. So if -- because it's Tier 1, it's not necessarily excused. But, as a practical matter, you know, if the State has set standards, and the environmental interests are generally satisfied with them, these things are going to get permits from the State, and the Corps is going to say well, that -- that will do. We've -- we're satisfied with that. We needn't inject ourselves into this situation in order to get something more favorable for the environment.

We don't have these tiers -- um -- but I think they're a good idea at the State level to make it simple. To things that aren't going to make a difference to the environment, there's really no point in spending more money than one has to if it's of no real benefit to the environment, but we don't have that. Our standards apply to all our permit decision-making.

REP. PATTEN: Okay.

VICE-CHAIRMAN PILOTTE: Follow-up?

REP. PATTEN: Follow-up on that one. And can you tell me, as you have read both -- you know -- or familiar with 108 and 109, that these standards that they have are no more stricter than what you have at the Fed level?

MR. ROACH: No. No. I think that they're consistent with what — —

REP. PATTEN: That they're even with where you are.

MR. ROACH: Yeah.

VICE—CHAIRMAN PILOTTE: Okay. Other questions? Thank you, Mr. Roach. Could I ask Paul Sanderson from the New Hampshire Municipal Association, and Mr. Sanderson indicates he is opposed to the rules.

PAUL G. SANDERSON, ESQ., Staff Attorney, New Hampshire Municipal Association: Yes. Thank you, Mr. Chairman. My name is Paul Sanderson. I'm a staff attorney at the New Hampshire Municipal Association, and, as you indicated, I'm here speaking in opposition to the rules. My opposition relates to the staff comment that you heard earlier, which is a problem under Article 28—a and RSA 541—A:25. And our problem stems from the fact that we believe that the Commissioner really conceded in the letter that they wrote to you on page three when they said, "The proposed rules are likely to increase the cost of installing new stream crossings and replacing at least some existing stream crossings." Okay. That's on page three of the Commissioner's letter of April 19th. That, to us, raises a prima facie case that there's a problem under Article 28—a.

VICE—CHAIRMAN PILOTTE: And could you give us a little bit more? I mean, you know — —

REP. PATTEN: We have three of eight. Do you know about where it is?

MR. SANDERSON: Yes, it is on page three of eight, and it is the -- one, two -- it's the third sentence in the third paragraph, and the paragraph starts, "Response: The FIS Requests submitted by the Department" --

VICE-CHAIRMAN PILOTTE: Okay.

MR. SANDERSON: And it is the third sentence there.

VICE-CHAIRMAN PILOTTE: Yep. Thank you.

MR. SANDERSON: That, to us, raises a prima facie case of a problem under Article 28-a and 541-A:25. I'm really not here to suggest to you that the department is trying to do something that may not be good public policy. However, 541-A:25 and Article 28-a do not contain an exception for good ideas. They don't contain an exception for things that might improve health and safety into the future. And that's why this argument is so dangerous for you, okay. Because to the extent that you say violations of the statute and Constitution are excused by good public policy, that they're excused by giving credit for things that might or might not happen into the future, that totally emasculates the provision of the Constitution and the strength of the particular statute in question.

The other excuse that we've had here today is that because of bureaucratic resource difficulties at both the State and Federal level, we may get more

prompt review or there may be somewhat slightly different standards or that you had a better deal at the State than you do at the Federal level. Those really are not excuses under these particular provisions. If in fact they have a cost, and it is being mandated, and it is being passed down, we believe that there's a violation. If there's anything that's unrelenting, it's our Constitution and our statutes. And so for those particular reasons, we believe that there should be a final objection entered on this particular ground. Again, I'm not suggesting that these are bad rules from the standpoint of public policy, but this is an unrelenting provision of our Constitution and statute, and so, therefore, we advocate a final objection on that for that reason.

VICE-CHAIRMAN PILOTTE: Representative Schmidt, followed by Representative Taylor.

REP. SCHMIDT: Thank you, Mr. Chairman. I appreciate your argument, but I don't think that's really the case that the State is making. The agency is not saying that we're imposing this because it's a better idea -- um -- whether it is or not, but because the Federal rules essentially require this, and it's a pass-through, and the State is merely articulating the standard in a way that makes it understandable or attempt at understandability anyway, and so -- but you haven't addressed that aspect at all in your remarks, so I'm wondering whether you're saying that the Federal rules don't require this, and the State is just kind of like doing it because it's easier for -- the two arguments that you made are both -- don't go at the argument that the agency really made, as I

understand it.

MR. SANDERSON: Yes. Thank you, Representative. And to that extent, if you take a look at each of these particular rulemaking proceeding requests and look at the table of statutes implemented at the end of each of these rulemaking proceedings, both 108 and 109, you'll see that they refer to various sections of RSA 482-A. They do not refer in any way to a Federal statute or to a Federal rule. Okay. So the department itself in its own rulemaking submission is not suggesting that they are implementing a Federal mandate.

And if we're to take that to its logical extreme, if this truly were the imposition or the pass-through of a Federal mandate, okay, then perhaps we should be dealing directly with Army Corps and not have the interim view here of having DES involved. That, in fact, is the view that USCPA has taken under the NPDES Phase II Storm Water Regulations. DES does not implement those. We deal directly with USCPA. And so I don't think that that's accurate when they say that they're simply passing through something that's a mandate. As Mr. Roach has indicated to you, yes, there are standards under the Clean Water Act, and yes, we can look at these either under the State general programmatic permit or we can look at them on an individual case, but he did not cite any particular provisions of Federal law or rule saying we're asking DES to implement these for us. Okay. So I don't think it's accurate to say that they are passing something through. If they were passing something through, they should have identified it in the Table of Statutes Implemented. They didn't do

so.

VICE-CHAIRMAN PILOTTE: Okay. Representative Taylor.

REP. TAYLOR: Thank you. My question is more about 28-a, and that's the State cannot pass down to the municipalities.

MR. SANDERSON: Yes.

REP. TAYLOR: But what if it's a Federal mandate? If the Federal rate increases their standards and says the municipalities must do something, is there -- don't municipalities have to do it?

MR. SANDERSON: Yes, we do, although there are provisions under Federal law relating to unfunded mandates coming from Congress. It's just that the financial amounts that trigger the Federal law is substantially higher than those would be -- would be involved in any particular project here. But if it's a Federal mandate, okay, then we should probably be dealing directly with Army Corps on these questions.

REP. TAYLOR: Thank you.

VICE-CHAIRMAN PILOTTE: Okay. Other questions? Thank you very much.

MR. SANDERSON: Thank you.

VICE-CHAIRMAN PILOTTE: Could I ask Mr. Kevin Nyhan from the New Hampshire Department of

Transportation. I hope I didn't massacre your name.

KEVIN T. NYHAN: Environmentalist, Department of Transportation: No. That's great.

VICE-CHAIRMAN PILOTTE: Thank you.

(Senator Carson leaves the room.)

MR. NYHAN: Thank you. For the record, my name is Kevin Nyhan, and I am here representing the Department of Transportation and in support of the rules. Um — — I'm here to reiterate some comments by Commissioner Campbell in his April 13th letter to JLCAR. At the March 5th meeting, the department had agreed with the — — some of the objections to the rules on costs. Since — — since that time, we have worked with the Department of Environmental Services on 108 and 109. We support both 108 and 109. We did work with the Department of Environmental Services to come up with those sections that were discussed on repair and rehabilitation, in-kind replacement and replacement, and we feel that those additions and changes do address our concerns.

At the same time we did also have concerns with the fiscal impact statement that was submitted, and — — um — — and, similarly, the rules' changes do address our concerns that we — — that we had in that regard. As part of our initial submission, we included a table that detailed some costs of projects that we had — — um — — and as well as what it would have cost to implement the rules. And, in reviewing that, we do feel that — — that the rules represent a cost-effective way to build projects that do — — that are permitable by the Army Corps of

Engineers and the Department of Environmental Services, so we feel that the rules, the way they're presented to you today, do address all of our concerns. And -- and the flexibility that's available in the alternative design section doesn't result in -- um -- you know, a mandate on us to go out and spend more money on every project.

We do want to thank DES for sitting down with us and coming up with these -- developing these changes as they have with their other partners, and the one request that we do have, and I'm not sure if that's been articulated or if it's been presented to you in writing, that we would request that the rules, if they are in fact approved, have an approval date or an implementation date of July 1st at the earliest so that we have time to -- um -- sort of clean out the queue of projects that we have in the works so that we can come up to speed with the rules when they are implemented. So I guess that -- the bottom line is that 108 and 109, as you move forward, are supported by the Department of Transportation.

VICE-CHAIRMAN PILOTTE: Attorney Eaton, is that an option that we have, to --

ATTORNEY EATON: If you approve it or accept the response, approve the rules, you can make a recommendation, but it's not --

VICE-CHAIRMAN PILOTTE: That would be up to the department?

ATTORNEY EATON: Yes, actually.

VICE-CHAIRMAN PILOTTE: Okay. Representative Patten.

REP. PATTEN: Thank you. Thank you, Mr. Chairman. When we go through the D.O.T. on your big project, and I'm not -- I'm assuming you don't -- very rarely do you have one stream that you deal with in -- sometimes you do. But on your large projects, do you get -- where is your primary permit coming from, the Corps of Engineers or from DES?

MR. NYHAN: Well, for all of our projects we're applying -- or we need to obtain two permits. The first is through the State, Environmental Services, and the second is through the Corps of Engineers. By and large, 98 percent of the time -- 95 percent of the time the Corps permit is through the State program general permit that Mr. Roach alluded to. For those other -- that other two percent -- it may be even less these days as we move towards a maintenance phase in the department's programs -- um -- we are applying for an individual Corps permit as well as for the -- um -- for the State permit, and that individual Corps permit -- um -- is just a higher regulatory review on the Federal level. So -- so, to answer your question, Representative Patten, it's both.

REP. PATTEN: Okay. Thank you.

VICE-CHAIRMAN PILOTTE: Okay. Other questions? Thank you. Thank you, Mr. Nyhan. Could I ask for Kenneth Roberts from the Town of Alton. Mr. Roberts indicates that they support the rules.

KENNETH ROBERTS, Highway Agent, Town of Alton, NH: Good morning, ladies and gentlemen. My name is Ken Roberts. I'm the Highway Agent for the Town of Alton. I've been at my job for about 17 years. In those 17 years, what I've tried to do is squeeze a -- you know, squeeze a quarter out of a dime. You know, that's what we do as highway agents. We're trying to build something for nothing and try to safe the taxpayers money. Technology changes. I can't say I've always been a good boy with the Department of Environmental Services. I probably had my hands slapped more than once, but through education from DES as well as from the Local Government Center and other people, you know, I had learned what it was all about. And, like I say, I got 17 years of learning this.

About a year and a half ago, I was invited to sit down in a meeting, and it had to do with the stream rules. I sat down, and the first presentation that came out would have cost my town close to a million dollars a year. Needless to say, I'm not a happy person, and I'm a good old country boy, and I voiced my opinion. Well, the opinion went across very well. It was understood, it was discussed, and things were changed. What the change came down to is what you see here today. You know, I can swallow this. I can accept this as a town.

You know, everybody talks about unfunded mandates. There's so much money running around outside there, it's very hard for myself as a highway agent or even the town administration to understand how much is out there. In the last couple of years, I've got $230,000 for some of these crossings through Emergency Management. I just

applied for another one through New Hampshire DES. There's a lot of funding out there that I don't know about that I know that it's there. I've been very fortunate. I have a soil scientist that works with the town and has directed me in a lot of different ways.

Last year I had a big problem. We already -- we were doing a crossing, twin culverts. I had an opportunity through a contractor to get a box culvert for the same job. We had already awarded the bid, went through everything. What were we going to do? They're getting ready to start in several weeks. They're getting ready to break ground. I approached the contractor. They're willing to do it for the same price. They're willing to give me the box culvert for the same price. Is it better for the environment? Of course it is, the natural bottom that we could possibly put in it, so I pressed the rules even though they're not passed.

My soil scientist went back to DES, and in seven days we had approval to do a box culvert. That's amazing, a seven-day turnaround. And not to downplay the Army Corps of Engineers, as it was said earlier, if I had to go through the Army Corps of Engineers for it, it would have taken me three months. I would have put in a set of twin culverts because it didn't make a difference to me, but it was better for the environment. And I think that's what a lot of this is about, you know. And, like I say, you know, to squeeze a dime out of everything, you know, you can't have everything absolutely perfect, and I've learned that. Embedded culverts. I've learned a lot over the years, you know, and

we're trying to implement them.

But as far as the protection of the environment, I hunt and fish, and, gees, it's pretty bad when you go to put in a box culvert, and you're standing at the other end, and you're looking for fish in the pool below it. You know, because Fish and Game came by and decided it was a big enough pool to drop a couple trout in, but there's an understanding there. Are they perfect? Nothing is perfect in this world. I learned that a long time ago. But I think what we see here today is acceptable. I can go back to taxpayers, and it's not costing me a million dollars a year.

I mean I'm pro to this thing because I was in the ground floor to sit in and be able to listen to all the pros and cons from all different directions that came in on the floor, and, believe me, some of them were pretty bad, and we all shook our head, and Public Works stepped in and said a few things, and a lot of things were changed, and compromise was made. And I think that's one of the biggest things I can say about DES today is that they're willing to work with you.

I have another project on the books that I'm working right now. We just had a meeting -- um -- and Rene Pelletier happened to be there. Is it perfect? No, it isn't. Is it better for the environment? It's a lot better situation which is out there today. It's a costly project, but it's better for the environment, and we all understand that. It's not perfect, but there's a compromise there. And I think that's what a lot of people aren't seeing is that everybody thinks this is cut

and dry, but I'll tell you since I learned what DES was all about and been working with them more and more through my soil scientist that I found out that there's compromise. They're willing to work with you. They know it's not going to be perfect, and I think that's what we have to understand about the rules. You know, rules are great. It's a black and white thing, but, again, if there's no compromise there, then we go nowhere, but if there is compromise and people to work with, we can go a long ways.

VICE-CHAIRMAN PILOTTE: Thank you. Representative Patten.

REP. PATTEN: Thank you. When you had your last project that you just said it's going to be a little bit more. It's environmentally friendly. When you were going through your budget process back before Town Meeting, did you get to the point where you were being able to say this is -- this is going to be more, but I'm going to put it in the budget, and so, therefore, the townspeople will end up voting on the extra amounts of money that I'm putting in my budget for my -- um -- you know, maintenance or whatever?

MR. ROBERTS: I've been very fortunate. What we put it into, we put it into a fund called road reconstruction, and what we do is we do everything through that road reconstruction, and it's kind of up to the Board of Selectmen which projects they're going to pick and pull, but one thing I do have to say is a lot of these projects that I've received funding about were major issues through rain storms that we lost roads.

I was in the State of Florida at the time we had the big rains several years ago, and I lost 33 roads. Thirty-three roads in a town puts it into gridlock. I mean that really closes things down. But we looked at this thing. What can we do to improve it? Let's start pulling grants. Let's start getting everything we can get out of everybody. You want to give it to me, I'm open hand. And they gave it to me. And we've really corrected the -- the last rains we had, I happened to be in Florida again over the heavy rains. Seein' my mom now.

REP. SCHMIDT: Stop going down there.

MR. ROBERTS: It wasn't sunshine, but I was down seeing my mom. But, you know, I contacted my crew by Nextel all day long. The heavy rains that came through, and when FEMA came down to say what did you lose, well, you know, actually I lost a couple truckloads of gravel, some edge washing. I have 89 miles of road I maintain. And that's all I ended up with, a couple truckloads of gravel. I think we've attacked it, and we've attacked it well. So we have an idea of what that is all about. And through some of these rules is what's going to help us in the long run, even as justification, to be able to stand up and say what do you want? We live on Lake Winnipesaukee. Gees, if we're not going to protect that place -- that's where the money -- that's where the big money is at. I'm sorry. All around the state you got lakefront property. It's a lot of good money. Do you want to protect it? And I guess that's a big issue.

REP. PATTEN: And just to follow up, so in your road reconstruction, that amount of money that you're going to put into that pot that the Selectmen are going to pull out, you get that approved at the Town Meeting every year?

MR. ROBERTS: Yeah. Yeah. Laurie is from the Town of Alton.

REP. PATTEN: I'm just asking the question. So that you do get -- -- when you're doing it, and you're getting into maintenance, that is reflected in your budget.

MR. ROBERTS: Yes. And one thing I kind of mention, and I'm not going to say it's me, but I guess it's the attitude of the town. We started this several years ago. We had 500,000. We went to 750,000. When we went to default budgets and almost everything failed, guess what passed overwhelmingly? $750,000. When 5,000-dollar items fail, I sit back, and I was like in shock saying wow, you know, this big item went through. There was no questions. Because people want to see that done. They want to see the plus side of it done, and I think you as individuals even driving on your roads in your own towns is like gees, if they're out there doing it, we're going to give them money to do it, and I think that's where they see it being done.

REP. PATTEN: Okay. Thank you very much.

VICE-CHAIRMAN PILOTTE: Thank you. Thank you, Mr. Roberts. Glenn Normandeau from the New Hampshire Fish and Game, and Mr. Normandeau also

speaks in favor.

GLENN NORMANDEAU, Executive Director, Fish and Game Department: Good morning. For the record, my name is Glenn Normandeau. I'm the Executive Director of New Hampshire Fish and Game. I'm here to speak for these rules. I'm not a constitutional scholar, so I really can't speak to the -- to that issue to you. Although it would seem to me that as well as wildlife, these rules are designed to help with stream flow related to these extraordinary events that we seem to -- be occurring on a regular basis these days, so perhaps in the long haul it's actually a money saving to a town as opposed to -- because it costs money continually to replace these washed out culverts. It's -- um -- probably my people who started with the million dollars that it was going to cost Alton because obviously my folks are -- um -- focused in -- strictly in from a fish and wildlife aspect, not really on what things cost. However, we've spent a lot of time with DES on this, and we believe -- certainly I believe that these rules now allow flexibility and -- um -- and -- um -- well, allow flexibility and reasonable costs for the public while at the same time doing a good job at allowing for the stream connectivity, the movement of fish and wildlife that we're looking for.

VICE-CHAIRMAN PILOTTE: Thank you. Questions? Representative Schmidt.

REP. SCHMIDT: Thank you, Mr. Chairman. Do you also see that there's a -- that -- a strong give and take between the department and the stakeholders and other agencies involved so that the department

does in point of fact react to expert input from road agents, from stakeholders, from contractors and so forth, and say this theoretical language that we have doesn't fit the practical world, and, therefore, we modify the language to accomplish the same objective but in a way that fits the reality of contractors or road agents?

MR. NORMANDEAU: I do. And, you know, I mean historically before I was convinced to take this position, I ran a heavy construction company for 19 years. I'm pretty familiar. I -- I was -- I had an intimate relationship with DES in my prior life -- um -- as being someone who's being permitted as opposed to being sort of on the other side. I think this is a good balance in that respect. Um -- Fish and Game owns -- owns or controls about 60,000 of the acres of land in the state, and we have miles of our own roads that we -- especially up in the North Country, so we are -- at the same time as we are commenting on these rules, we are also a -- there are certain conditions, a regulated -- um -- community also, and -- and, like every other State agency, we're scrambling around for pennies on the ground, so, you know, in my position I can see both sides of those issues.

Um -- obviously, in fact, when we had those Mother's Day floods of a couple years ago, we lost several of our stream crossings in the Connecticut Lakes Natural Area, which is a 25,000-acre parcel we own. We are obligated to keep those roads open for the public. We get -- um -- something on the order of $28,000 a year out of the -- um -- um -- out of the -- um -- fund to do maintenance up there, which, you know, as you know, is like a drop

in the bucket. So, you know, I certainly understand the financial aspects involved, and I think that the DES has really done the mileage to try to go as far as is possible to ameliorate the financial concerns while at the same time handling the environmental side of it, I mean -- um -- and keeping a set of rules together that actually does something as opposed to, you know, watering it down so much that there was -- that it -- you know, they weren't effective in any improvements.

VICE-CHAIRMAN PILOTTE: Thank you. Other questions? Thank you, Mr. Normandeau.

MR. NORMANDEAU: Thank you.

VICE-CHAIRMAN PILOTTE: Can I ask for Chris Albert from the New Hampshire Association of Natural Resource Scientists.

CHRIS ALBERT, Legislative Chair, NH Association of Natural Resource Scientists: I do have written testimony to give out, also.

(Mr. Alberts passes out a document.)

MR. ALBERT: Again, Chris Albert, for the record, representing the New Hampshire Association of Natural Resource Scientists, abbreviated as NHANRS. I'm not too sure if any of my predecessors have come here before, but we're a nonprofit group of wetland scientists, biologists, soil scientists, both from the private and academic facilities throughout the state. We've been actively engaged in this rulemaking process for the past three years, and it's taken a long time to see the documents that

you're seeing today, the final version. You know, we endorse the rules that are there. Really we're really looking at — — you know, from a storm water quality — — um — — the scientific approach that's come through for methodology, it does work. This has been downplayed quite a bit. You'll see a lot of the italics that's worked back and forth with Fish and Game, D.O.T — — um — — the different agencies. Some of the municipalities are for it, and some are against it, as you can see today. But we feel that it's long overdue. It's necessary.

Right now you're looking at rain events from 2005 till now. I think the '06 and '07 rains were ranked number one and number two, and the one in 2010 was ranked fifth for the Lamprey River stream gauges, so you're seeing a lot of catastrophic rain events occurring in the state at this point. From the NHANRS' perspective, I wanted to try to digress a little bit to my own personal consulting. I'm working for the Town of Epping. Um — — in that town in 2007, a road was washed away. We were retained to look at the hydraulics and come up with a recommendation for a new culvert. That cost was approximately $90,000 to have it put out to bid. The town, of course, didn't have the funds to do that. Well, in 2010, they lost it again in February. They lost it again in March. They finally sat down with us, and the town road agent did it themselves for $50,000.

So when you look at the fiscal impact — — um — — that's been discussed today, you know, having roads washed out, having communities have to travel five miles to get home to their houses — — um — — that's only going to keep happening throughout the

state, and these rules are a base guideline to get a plan going for all these catastrophic events. We're just going to keep going. Really, you know, from Rich Roach and Corps and EPA, a lot of this comes back to Clean Water Act for antidegradation to the rivers, and I represent a lot of different towns and -- well, a lot of different committees, and this pressure from the State, Federal Government is going to keep going as far as the water quality to these rivers.

Um -- so this is really, again, just a first step to get, from a design standpoint, those cross-culverts. I know there was discussion about the NPDES storm water permits through EPA. Those were a two-page form that has to be done with a storm water management plan on file. So -- you know, through the EPA on one-acre sites. I would much rather do those all the time than have to deal with DES on the AOT site specific permits for that time that gets involved, but I'll take questions, I guess, at this point.

VICE-CHAIRMAN PILOTTE: Thank you. The second person in the last two speakers who mention the fact that since we're having hundred-year floods, we're probably -- everybody in this room is over 200 and some odd years old by now. I have no desire to live to be 900, so. Okay. Thank you so much. Are there questions? Thank so you very much.

MR. ALBERT: Thank you.

VICE-CHAIRMAN PILOTTE: Any other persons who would like to address us? Miss Hamel, Mr. Pelletier, could I ask you to come. And you've

heard some of the objections, the one from Mr. Sanderson that -- um -- 28-a means 28-a. This is one that we're going to have to look at a lot. But the other concerns from Mr. Abbott and the specifics about whether or not -- how the designs -- and this deals primarily with the 109s, and I know you were listening, and I know you dealt with them, et cetera. Could you address those issues for the Committee, please.

MS. HAMEL: Certainly.

VICE-CHAIRMAN PILOTTE: Do you have his comment?

MS. HAMEL: Yes.

VICE-CHAIRMAN PILOTTE: Yes. Thank you.

MS. HAMEL: Well, starting with the 28-a issue, because, that's -- you know, it's so much easier to deal with, I just want to point out that the language that Mr. Sanderson read from our response letter was quoted from the fiscal impact statement request that we filed in July of 2009. That was as applied to the original rule. These rules, you know, look something like those -- um -- but have had extensive revisions since those statements were made. I don't -- I think the conclusion that I would reach is the same, which is some may be more, some may be less, and we don't really have a way to tell what's going to happen where, but, you know, in terms of an admission by the department, I would -- I guess I would take that with a grain of salt.

I don't think that we ever intended to assert

that we were trying to impose costs on anybody through these rules, that we were trying — — what we were trying to do, as we stated originally, was to consolidate all of our requirements into one place for stream crossings because right now when you look at our rules they're hard to find. If you want just to do a stream crossing, it's very hard to find what applies to them. So now it's easy to find. They're going to be in one chapter.

We are trying to make it clear that our standards are the same as the Army Corps of Engineers applies. Because, as you've heard, they have jurisdiction over the same stream crossings, and we think that it is — — um — — in the public interest to make that process as transparent as possible for all of the projects that would qualify in the programmatic general permit, and despite Mr. Sanderson's testimony — — um — — I — — I think it unlikely that a great many municipalities would rather deal with the Army Corps on these crossings than with DES. If he — — you know, if he — — if you really think that's true, then perhaps we should start a rulemaking to, you know, say that municipalities have to apply theirs. They can't use these. I don't know what the answer to that is, but I just think that it's — — I'm not sure his position would be well-served by that statement.

VICE-CHAIRMAN PILOTTE: Representative Schmidt.

REP. SCHMIDT: Thank you, Mr. Chairman. I listened carefully to Mr. Sanderson's testimony, and, as I understand it, it comes down to that — — two things. Number one is, you know, you're not allowed to violate the Constitution just because it

would be better to do it this way. And -- and that Army Corps is -- is an alternative that towns did deal with the Army Corps, but the nub of his argument is that you don't in any place in the rules assert that you are passing through and doing what the Federal standards require. You're only citing State statutes, and that's -- that's not sufficient basis to address the 28-a issue. So that, to me, is the central issue. Can you please speak to that?

MS. HAMEL: Certainly. I -- the lack of a column for Federal requirements on our appendix, I think, is unfortunate, but I don't think it has a substantive impact on the underlying truth, which is that these do reflect the Federal requirements and that those requirements apply whether we adopt them in these rules or not. Um -- I -- we can put forward a new appendix, if you would like to see that, with all of the programmatic general permit and 404, whatever the citations are, and the rest of it in the third column. Um -- as a legal matter, it doesn't change anything.

VICE-CHAIRMAN PILOTTE: Attorney Eaton, is that an option that the department has currently?

ATTORNEY EATON: Yeah, an appendix is simply something to be editorially changed. They could change it at the time of adoption, add Federal requirements if they wanted to.

VICE-CHAIRMAN PILOTTE: But they do have -- in the appendix, they can reference the EPA or the Corps or others? That's the question.

ATTORNEY EATON: Yeah, it's supposed to

identify Federal law if implementing Federal law. I thought the argument, however, was more like if they were doing much the same thing. And if they didn't do the same thing, then the Federal Government would step in, which isn't quite the same thing as implementing Federal law. In practical terms, it seems like it may in fact be so, but legally it's not quite the same thing, but it's all editorial anyway. If the department concludes that that's what they're really doing, they can, you know, add it at the — — um — — adoption stage to their appendix.

VICE-CHAIRMAN PILOTTE: But the fact that — — or underlined by Representative Schmidt that Mr. Sanderson's objection was that the Table of Reference refers only to the State statutes and not to the Federals, therefore, the pass-through cannot be considered a pass-through or — —

ATTORNEY EATON: Well, leaving aside — — I thought that the appendix simply recognized what the department's original conclusion was, is that they're not, strictly speaking, administering a Federal mandate like one implements the Clean Water Act or the Clean Air Act, but that their requirements, if not carried through, would result in the Federal Government stepping in. So, in practical terms, it seems as if they're implementing the Federal mandate, but they're not doing it on behalf of the EPA like they do — — as I understand it, like the Clean Water Act or the Clean Air Act, and, therefore, strictly speaking, you wouldn't normally see it in a cross-reference table because they're not really implementing the law, so it's more a question of practical versus legal effect

here.

VICE-CHAIRMAN PILOTTE: Thank you. Yes, Representative Patten.

REP. PATTEN: Yes. Thank you. Going along with that, I know that I have perhaps been here too long, and in the appendix always I have seen if there's been a CFR or whatever, so that what happens is if I wanted to find out where you get the authority to do what the Feds are telling you, that I could do that, and always it has been amicable to the department to put that in whether it's yours or another so that we can see it. I know that they're not -- you're not really implementing them, but if this -- there's part of me that wants to look at the RSAs and find out where in the world is your authority for the Tier 1, 2, 3, and that has apparently been answered to the stakeholders, except to the municipalities, and I'm not sure. I think that perhaps the citation to the Fed regulations would be good, even though perhaps we're not -- you're not legally doing them, and I realize that the programmable is what -- got another two years to be there so that you've got time to do that or, you know, to -- you know, to put those in. It's not like you can't have time to do that, but I think the appendix is not -- you know, is an important part of your rules. I go there a lot to find out where your statutory authority is.

VICE-CHAIRMAN PILOTTE: Okay. Other questions? Okay. Yes. I'm sorry. Representative Millham.

REP. MILLHAM: I'm trying to be a little

devil's advocate on that. If they are citing that as a reference, but it really isn't a reference, is that confusing to the person who's looking at it?

REP. BOYCE: And if they're setting that, are they going to have to – – have to go by that rule? If our State is restricted, other ones, I think it would be a problem.

VICE–CHAIRMAN PILOTTE: Okay. Yes, Representative Schmidt.

REP. SCHMIDT: Perhaps we've spoken at this point enough about the 28–a issue – –

VICE–CHAIRMAN PILOTTE: I'm sure.

REP. SCHMIDT: – – but some people obviously are a little bit up in the air as to whether you sufficiently addressed it or not, but Mr. Abbott's specific objections to specific aspects, I think, are important.

VICE–CHAIRMAN PILOTTE: And that's where we're going next.

REP. SCHMIDT: Yeah.

MS. HAMEL: Certainly. First of all, I – – um – – the – – one of the first documents that he handed around that's dated April 1st – – um – – I believe was presented to the House Public Works and Highways Committee, as it says on there. I'm taking that as true. And can't possibly reflect the rules as we proposed 'em in the objection response because they weren't done yet on April 1st. In particular,

there is no 25-acre limit in the tier structure anymore. There's no slope requirement in the tier structures.

REP. SCHMIDT: If I could just interrupt. I don't take a document from April 1st as anything more than background to give us an idea of where the contractors were on April 1st before the House Committee, and the process is a lot further down the road right now, so I am not sure that you need to knock down all the points that he raises there.

MS. HAMEL: Okay. I just -- I felt compelled to because you specifically asked him whether the changes we made address the concerns in this letter, and he said no.

REP. SCHMIDT: No. This was the document I was referring to --

MS. HAMEL: Okay.

REP. SCHMIDT: -- where he specifically --

MS. HAMEL: Apparently I wasn't there.

REP. SCHMIDT: -- and he talked just to these issues --

MS. HAMEL: Okay.

REP. SCHMIDT: -- and said that these were technical objections specific to 109. That's where I'd like to go.

VICE-CHAIRMAN PILOTTE: Okay.

MS. HAMEL: And these we saw, I believe, initially earlier this week, so they were not received in time to be able to address in the objection response, but I am happy to address them now because I don't believe -- um -- that the problems that he's seeing are really there. The first one on page 13, 904.09, alternate designs -- um -- the (c) (2) is one of the criteria for approving an alternative design for a new Tier 2 crossing, a replacement Tier 2 crossing that can't meet the replacement criteria, which was that it was legal, and it's not been causing flooding problems, or a newer replacement Tier 3 crossing.

Those are the same crossings that are covered by 904.05, which is the design criteria for Tier 2 and Tier 3 stream crossings, which, if you look at page 10, now says new Tier 2 stream crossings, replacement Tier 2 stream crossings that do not meet the requirements of the replacement sections and new and replacement Tier 3 crossings. So there is no inconsistency there. Those are the crossings that are required to -- um -- that are required to meet those design standards, the specific standards. And those are the same one in paragraph three.

And the maximum extent practicable, I -- I have to tell you that the intent -- and I don't -- I don't know why it's confusing because I think I know what it means, I guess. The intent is that if you're submitting an alternate design because complying with all of the standards is not practicable, you can't just not comply with any of them because you don't feel like it. You have to meet as many of them as you can. So that is what

all that language says.

REP. SCHMIDT: If I may?

VICE-CHAIRMAN PILOTTE: Yes, please.

REP. SCHMIDT: As I said, you heard me ask him several times whether he had discussed each and every one of these issues with you before this morning. In other words, whether he had raised these issues with you before this morning, so I'm wondering whether you see the possibility that a reasonable person could misunderstand some of the language of your proposed rules to the extent that he or she would then have these -- these objections that are raised, and, if so, whether you see in the interim, since he first raised them with you until today, whether some improvements in the language might be -- might be advisable or -- or feasible or whether you think that it's -- that if they merely consult with the department, you can clarify what you're characterizing as a misunderstanding of your intent in the language.

MS. HAMEL: Well --

RENE PELLETIER, Assistant Director, Water Division, Department of Environmental Services: I responded to that.

MS. HAMEL: Go ahead.

MR. PELLETIER: If I might, Representative Pilotte.

VICE-CHAIRMAN PILOTTE: Please.

MR. PELLETIER: Gary did send me that E-mail. I think it was a day or two ago. We in fact sat down and evaluated his concerns that you see in front of you. I did respond to his E-mail, basically explained why we did not agree with what he was stating in the -- and tried to clarify and further explain why we felt that we couldn't agree with his opinion. So he has gotten a response from the agency. I think some of it may have been a misunderstanding, but I think at the end of the day, just to be succinct about this, is the issues that he raises in all three or four of those items, we felt a significant change that was made about a month or so ago was the section 904.09, which was the alternate design section which he speaks to.

REP. SCHMIDT: Um-hum.

(Senator Carson returns to the room.)

MR. PELLETIER: And when we talk about maximum extent practicable, if you go to 904.05 in the rules, it talks about criteria that you're looking to try and achieve when you're putting in a new culvert or replacing a culvert. 904.09 gives a -- an opportunity -- let's say when they talk about stream connectivity, and what that talks about is you don't place a culvert in a water body, so you juxtapose it. So instead of it being free flowing where wildlife habitat or fish can travel the passage, that if you juxtapose it, then the discharge is going into a bank. We have some concerns about that because it creates bank erosion.

So – – but if you get in a situation – –.let's say that you were going to replace or put in a new culvert, and one of the parts in 904.05 talks about stream simulation, and you're putting in a culvert in bald-face ledge. Well, 904.09 allows you to come in and say section (c) – – and I don't remember which particular one is – – it's (d) actually, I think, connectivity, that you can't meet it because in fact there's ledge on the ground. This is the best you can do.

Section (b), I think, speaks to the vegetation issue. Well, if you get into a situation where there's no vegetation or it's impracticable because of slope or soil that vegetation can be able to be retained, then 904.09 gives you the alternative design option of stating why you can't meet that criteria. So all of the issues from his top four all seem to reflect back to 904.05 relative to 904.09. We, by design and after a lot of input in the last month or two, significantly since we went before the Public Works Committee, put in 09 because we understand that in situ situations are really going to rule the day, and what that section does is it gives anyone an opportunity to come in, look at 904.05 and tell us why they can't meet it, and it opens the door. Prior to the last month or two, that section wasn't in here.

MS. HAMEL: Well, it was, but it didn't say that.

MR. PELLETIER: Well, a little differently, right. So we feel that all of the issues on his letter that he talks about, he's doing a lot of reflecting back to 04, 05, and the stream rules talk

about box culverts. We've heard that conversation today. That's a pretty voluminous document. You know, it talks about open-box culverts. We have adapted the stream rules so if you get in a situation other than perhaps Tier 3, which is a square mile of watershed, so if you might imagine in your mind's eye how much water will come off one square mile.

We've looked at Tier 1s, Tier 2s and Tier 3s. The reason we chose to go to that approach, because we felt it made it a lot more simpler and understandable for the regular layperson because D.O.T. and towns aren't the only people that use these rules. Developers use them. Individual homeowners use them. There is a vast array and a large audience of whom have to comply with these. So we went to the Tier 1s, that zero to 200 acres. It's pretty easy for a homeowner to figure out, you know. And when you get into that situation there's no PE required. There's no requirement you spend $5,000 to have an analysis of the watershed because the stark reality is in most 200 or less watersheds, you're probably going to look at a maximum diameter of 42 inches when you do the hydrology.

You know, so you look at a stream crossing, and probably the worst case scenario is going to be in that 42-inch range maybe. Depending on slope, you may get into 48-inch, but they're pretty small culverts, which, I might add, that I would guess 85 to 90 percent of municipal culverts probably fall in that three-foot diameter range, and Ken could probably speak to that better than I, but I want you to keep in mind that if that's the case, they don't even file an application. They file a notice of

replacement, anything that's three feet or smaller. So the vast majority of culverts are going to be done pretty innocuously as far as the regulatory process goes. When you get into the Tier 2s, which is 200 acres up to 640 acres, that's when you see a significant amount of water that's going to go down the stream thread.

It's those situations where we believed, and the Corps believed, because they were part and parcel to this three-year process, that albeit initially if someone went in eyes wide open, they would put in the right-size culvert, but when you look at the fiscal impact of this, and historically we know because we issue emergency permits, many in the last two years, as you might imagine, and many of those permits are -- 99.99 percent have been issued because of poor culvert design. The thing you have to think about is what worked 30 years ago in a road culvert may have worked for the last 20 years prior to the last two or three-year storm events.

What's happened, though, dramatically is watersheds have changed. Buildings have been built. Driveways have been paved. FEMA is remapping all of the flood plains in the Northeast because the hundred-year flood plain is no longer the hundred-year flood plain, and the reason being is there is a lot less wooded area that in fact attenuate that kind of volume of water that we get. So all of these issues I firmly believe because I'm there, and we look at the issues. Towns, many times, and I think Mr. Roberts spoke to this, have thrown good money away to bad because they've chosen to look at what was installed 30 years ago. We get

another anomaly, a major storm event, and the road is gone again. So there is some rhyme and reason, not only from the public safety perspective and environmental perspective but of cost perspective.

So these rules allow all of that to be considered. They can look at what's required. And if there is the maximum extent practicable, and if that's if the cost is outrageous, that's if they got geology that doesn't permit following 904.05, they can come back at us. So there is a lot of negotiation in many cases, but, again, 90 percent of the municipal culverts we don't see.

VICE-CHAIRMAN PILOTTE: Mr. Pelletier, could I ask you, in dealing with maximum extent practicable - -

MR. PELLETIER: Um-hum.

VICE-CHAIRMAN PILOTTE: - - to the - - where practicable.

MR. PELLETIER: Yep.

VICE-CHAIRMAN PILOTTE: Now we've added to the extent practicable. What have we added?

MR. PELLETIER: I think, as Gretchen - -

VICE-CHAIRMAN PILOTTE: And you can see my next question is to the maximum extent practicable, what's being added? What advantages are there to using the extra words other than practicable?

MR. PELLETIER: I think our intention, and we talked about this quite a bit actually because it's sort of like beauty is in the eyes of the beholder. The term practicable is pretty broad, and I think we have had situations -- -- because we've had practicable in our rules, the Wetlands rules for quite a while.

VICE-CHAIRMAN PILOTTE: And the definition we've been given is means available, capable of being done after taking in consideration costs, existing technology and logistics in light of overall project purposes.

MR. PELLETIER: Right.

VICE-CHAIRMAN PILOTTE: So I see that and then see to the extent practicable and to the maximum extent practicable, and I'm wondering what we've added by using extra words.

MR. PELLETIER: I think that's a very good question, and I think the reason that we've made that perceptibly a little stronger is because on the application end of the process there's been a wide array of what people consider practicable. And I think Gretchen articulated that earlier is that when you look at (a), (b), (c), (d) and (e) on 904.05, there are some people out there that believe practicable is eliminating (a), (b) and (c) and trying to meet with (d) or (e). And I think it was our attempt to make sure that, you know, look at all five, you know. And if you can meet three of the five, then you've reached that maximum extent possible. If you can meet three of five, and you come in and meet one of five, then that's where you

get the gray area in this term practicable. So we felt that it would help clarify. Our goal with all of our rules is we try and get it so people can get it right the first time around.

VICE-CHAIRMAN PILOTTE: Okay.

MR. PELLETIER: And that's our hope.

VICE-CHAIRMAN PILOTTE: Thank you.

REP. SCHMIDT: Helpful having that on the record.

VICE-CHAIRMAN PILOTTE: All right. And that is particular to 109. Okay. Other questions from the Committee? Okay.

MS. HAMEL: Mr. Chairman - -

VICE-CHAIRMAN PILOTTE: So now in motions, however. I'm terribly sorry. Gretchen, I'm terribly sorry.

MS. HAMEL: There was one item on Mr. Abbott's list that we hadn't talked about. I didn't know if you wanted to address it. The watercourse connectivity.

REP. PATTEN: Connectivity, yes.

MS. HAMEL: In the general design criteria.

VICE-CHAIRMAN PILOTTE: I'm sorry.

MS. HAMEL: Well, I don't - - just in case you,

you know, left and said oh, I never heard about that. The general design criteria, I think I mentioned earlier -- or in the letter explains that we -- the language has been revised to more closely track that that's in the -- in the Army Corps' requirements and the programmatic general permit. So that's where you see -- um -- that was the basis for some of the revisions.

Paragraph -- and now I'm looking at page seven of OR 2009-109 response, the rule at the bottom of the page. The previous requirement was actually in (d), which is preserve or restore connectivity. We broke that out so that it was clear that if the connectivity is there, you'd have to preserve it, and then (f) is intended to address where it's not there already, and the standard is that you restore it basically if it makes sense to do that and if it was disrupted because of something that a human being did already.

So if the -- you know, if there's a culvert there with the end that hangs down so that nothing in this pool can get into the culvert to go upstream, that's clearly a manmade disruption in connectivity. And if that is needed -- um -- to benefit aquatic life or water passage, then we're going to ask you to restore it. But if in the case -- for instance, as one of the ones that Rene gave, if this is, you know, on ledge, and there's nothing in the water that could have gotten up there anyways, then we're not going to -- we're not going to look at that one. That would not be a case where we would ask you to restore the connectivity. So I -- the changes to that were an attempt to clarify that we're not going to try to make you do something

that's just not realistic to do.

VICE-CHAIRMAN PILOTTE: Okay.

MR. PELLETIER: Mr. Chair, I'd like to speak to connectivity just quickly.

VICE-CHAIRMAN PILOTTE: Yes.

MR. PELLETIER: Mr. Roberts from Alton had mentioned that he had gotten some FEMA grants, and when we were writing these rules and we talked about the concept of connectivity, you need to know that if you're going to apply for a FEMA grant, then one of the criteria that they look at for funding a project if you reach that threshold is connectivity.

VICE-CHAIRMAN PILOTTE: Okay. So where are we? At the point of being open for a motion on 2009-108. And 108 seems to be the one that had the issues that were addressed today. We did have a conditional approval request for 108 that was dated March 3rd, and I will ask again, Attorney Lucas, in the conditional approval request all of the staff issues have been addressed; is that correct?

ATTORNEY LUCAS: That's correct, except for the two -- --

VICE-CHAIRMAN PILOTTE: I'm sorry.

ATTORNEY LUCAS: Except for the two notes that I talked about, the comments of the fiscal impact statement and/or the comment to 28-a and 541-A:25.

VICE-CHAIRMAN PILOTTE: Yes.

ATTORNEY EATON: The conditional approval request changes are simply part of the objection response.

VICE-CHAIRMAN PILOTTE: Okay. So - -

REP. PATTEN: So we're not - - we wouldn't need to do - -

VICE-CHAIRMAN PILOTTE: So, in other words, if the motion accepts the objection response, it incorporates the conditional.

ATTORNEY EATON: Yeah, to the extent the department included them, but I understood it - - it all became part of the response.

VICE-CHAIRMAN PILOTTE: Okay. We are open to a motion.

** REP. SCHMIDT: Mr. Chairman, at this time I will move approval of - - um - - 2009-108.

VICE-CHAIRMAN PILOTTE: That includes acceptance of the objection response and approval of the underlying rule; is that correct?

REP. SCHMIDT: Correct.

VICE-CHAIRMAN PILOTTE: Yes. And Representative Taylor seconds. Any questions or comments?

REP. PATTEN: Mr. Chairman, I have been listening. I - - um - - do believe that there will

be costs to the municipalities in the strict sense of we shouldn't pass it on. I'm not going to be able to vote for the response. I do want to say thank you to the department and for all the stakeholders that have worked so hard. I just still have a problem with the -- with the 28-a issue. I thank you for what you have done. You've made the rules as best as they can be.

VICE-CHAIRMAN PILOTTE: Okay. Other questions or comments? Okay. All in favor of the rules? Opposed?

REP. PATTEN: No.

SEN. CARSON: No.

REP. BOYCE: No.

REP. KIDDER: No.

VICE-CHAIRMAN PILOTTE: Okay. We have to have a show of hands here because -- -

REP. SCHMIDT: I think we should have a roll call.

VICE-CHAIRMAN PILOTTE: Okay. Fine.

(Attorney Eaton hands a document to Representative Pilotte.)

VICE-CHAIRMAN PILOTTE: Thank you. So this is on 108. Representative Patten?

REP. PATTEN: No.

VICE-CHAIRMAN PILOTTE: Representative Millham?

REP. MILLHAM: Yes.

VICE-CHAIRMAN PILOTTE: Representative Boyce?

REP. BOYCE: No.

VICE-CHAIRMAN PILOTTE: Representative Taylor?

REP. TAYLOR: Yes.

VICE-CHAIRMAN PILOTTE: Representative Kidder?

REP. KIDDER: No.

VICE-CHAIRMAN PILOTTE: Senator Carson?

SEN. CARSON: No.

VICE-CHAIRMAN PILOTTE: The Chair votes yes. It is four to three.

REP. SCHMIDT: You didn't call me.

REP. TAYLOR: Right.

VICE-CHAIRMAN PILOTTE: I'm sorry, Representative Schmidt. I'm sorry. Representative Schmidt?

REP. SCHMIDT: Yes.

VICE-CHAIRMAN PILOTTE: Four to four, and so that motion does not carry. Is there another

motion? Attorney Eaton, I'm going to need some direction on this. Where are we at? Where does this leave us?

ATTORNEY EATON: Okay. Well, the clock is still running as far as the opportunity before the agency can adopt the rules. The Committee's deadline to take some action on this is June 8th. If you cannot take action until after that date, then the agency after June 8th is free to adopt no matter what you do. June 8th is your deadline to vote to sponsor a joint resolution. That option is what keeps the agency from adopting the rule at this point. So at this point you can either do another motion — — um — — otherwise, it will just roll to the next meeting as an item that has not yet been dealt with by the Committee.

VICE-CHAIRMAN PILOTTE: And at the next meeting the transcript of today's deliberations would be available to anybody who wants it?

ATTORNEY EATON: I'd have to check with the LBA as to whether it would be available by that time, but yeah, certainly if it is ready, we can provide it.

REP. PATTEN: And that's when? When do we have — — May 7, 14, 21?

ATTORNEY EATON: Yeah, your next meeting date is May 21st. Two weeks from today.

VICE-CHAIRMAN PILOTTE: Okay. And that would be the — — the continued meeting for that one would be on June what?

ATTORNEY EATON: Fourth.

ATTORNEY MORRELL: Fourth.

VICE-CHAIRMAN PILOTTE: Fourth.

REP. PATTEN: We have two meetings.

VICE-CHAIRMAN PILOTTE: So there are two meetings, the continued meeting -- the next meeting and then the continuation. Okay. So we can try to move, but it will be -- it can be addressed at our next meeting?

ATTORNEY EATON: Yeah, you still have --

VICE-CHAIRMAN PILOTTE: Let me then --

REP. PATTEN: Yeah, because, Mr. Chairman --

VICE-CHAIRMAN PILOTTE: -- mention to all the members that are here that all other things being equal, this will be taken up at the next meeting, so if -- if, you know, you had hoped to not be here and wanted to have your vote in because of today, make sure you're here, okay. Representative Patten.

REP. PATTEN: I'm not going to make a motion to do that because I think we're locked, so we might as well just leave it as four to four on 108.

REP. SCHMIDT: I have a question for Attorney Eaton.

VICE-CHAIRMAN PILOTTE: Yes.

REP. SCHMIDT: The same situation applies to 109 or does it?

ATTORNEY EATON: Well, 109 you've taken no vote yet.

REP. SCHMIDT: No, no, but the – – the same comments – –

VICE–CHAIRMAN PILOTTE: Same deadlines?

ATTORNEY EATON: Same deadlines, yes.

VICE–CHAIRMAN PILOTTE: Okay.

REP. SCHMIDT: Yes. If I would make a motion on 109, it would be equally fruitless, so we should postpone it.

REP. PATTEN: No, I – –

VICE–CHAIRMAN PILOTTE: Well, I will still take a vote on 109, and then – – you know, with the same – – whatever. So I would take – – we are open to a motion.

** REP. SCHMIDT: I will move approval of – –

VICE–CHAIRMAN PILOTTE: Accepting the objection response.

REP. SCHMIDT: – – accepting the objection response and approve the final proposal on FP 2009–109.

REP. BOYCE: Second.

VICE-CHAIRMAN PILOTTE: And seconded by Representative Boyce. Okay. Okay. Do we wish to have a roll call on this one or - -

REP. SCHMIDT: Certainly.

REP. PATTEN: Yeah.

VICE-CHAIRMAN PILOTTE: If we could, please.

(Attorney Eaton hands a document to Representative Pilotte.)

VICE-CHAIRMAN PILOTTE: All right. Representative Schmidt?

REP. SCHMIDT: Yes.

VICE-CHAIRMAN PILOTTE: I apologize to you. Representative Patten?

REP. PATTEN: No.

VICE-CHAIRMAN PILOTTE: Representative Millham?

REP. MILLHAM: Yes.

VICE-CHAIRMAN PILOTTE: Representative Boyce?

REP. BOYCE: Yes.

VICE-CHAIRMAN PILOTTE: Representative Taylor?

REP. TAYLOR: Yes.

VICE-CHAIRMAN PILOTTE: Representative Kidder?

REP. KIDDER: No.

VICE-CHAIRMAN PILOTTE: And Senator Carson?

SEN. CARSON: No.

VICE-CHAIRMAN PILOTTE: The Chair votes yes on this one. This one will carry five to three. Okay. Thank you very much.

*** **{MOTION ADOPTED}**

VICE-CHAIRMAN PILOTTE: And -- um -- do we need a break? I think at this point, yeah, would you want a -- I believe the next item on the -- for the Committee will be to look at the drafting procedures manual proposal, changes that are being made, so that's what we'll be working with when we come back.

(Recess taken at 11:39 a.m.)

(Resume at 11:52 a.m.)

12. Discussion on Amendments to Drafting and Procedure Manual for Administrative Rules

VICE-CHAIRMAN PILOTTE: Okay. Can we come back, please. What we're going to be looking at really again if you have your -- the draft manual -- um -- drafting manual changes from last time,

Additional HB 621 testimony.

QUANTUM CONSTRUCTION CONSULTANTS, LLC
27 LOCKE ROAD, CONCORD, NH 03301-5417 TEL: 603-224-0859 FAX: 603-224-3625

TOWN OF NORTHFIELD, NH
SILVER LANE - 60" CMP CULVERT
CULVERT REPLACEMENT PROJECT

PERMIT FEE ESTIMATE
November 9, 2010

TASK DESCRIPTION	WORK HOURS					TOTAL HOURS
	PM	PE	E	D	TT	
NHDES Environmental Permit Applications						
Hydrology / Hydraulic Evaluation	1		5			6
Wetland Impact Plan & Erosion Control Details		1	7	8		16
Shoreland Protection Permit Application	Not applicable					0
Army Corps of Engineers Plan Submittal	1	1	4	8	1	15
Wetland Permit Application Preparation	1	2	15	16	2	36
Respond to NHDES comments	1		4	4	1	10
Subtotal Environmental Permit Work Hours	**4**	**4**	**35**	**36**	**4**	**83**

ESTIMATED ENGINEERING COSTS

	Work Hours	Hourly Rate	Estimated Costs
Principal*/Sr. Project Manager	4	* 120.00	480
Sr. Project Engineer III	4	120.00	480
Assoc. Project Manager/Project Engineer	35	85.00	2,975
Sr. Project Designer I	36	85.00	3,060
Technical Word Processing	4	60.00	240
	83	Total Fully Burdened Labor	$ 7,235
		Estimated Direct Costs	$ 500
		QCC TOTAL ESTIMATED DESIGN COST =	**$ 7,735**
		Wetland Scientist	**$ 750**
		Survey	**$ 1,200**
		TOTAL ESTIMATED PERMIT COST =	**$ 9,685**

* Principal rate capped

This is AN Actual quote for Engineering Services to complete the application only! One culvert. AFTER STREAM CROSSING rules put in place....

Testimony for HB 621

Dear, Ted Diers 2-19-2008

I am writing with a constructive response to my concerns to the Wetlands Program Improvement Initiative (WPII).As the Deputy Director of The Public Works Department for The Town of Bow, I have been honored with the roll of instructing Proper Drainage training sessions with the UNH T2 program for more than six years .This program leads New Hampshire Municipal and State Employees in Proper Construction and Maintenance procedures to keep the State Road System Safe and Structurally Sound.

I feel now is the time for me to voice my utmost opinion about the DES procedures in place at this time. The Environment is important to me and the future of the world .As a Professional Road Manager I strongly feel that many flood events of the past two years could have been prevented, if Public Works Employees who have been trained properly were released from the scrutiny of the DES . Road Managers all through out the State have been "Gun shy" when it comes to maintaining the infrastructure they are responsible for. Many Road Managers in the State feel very uncomfortable, due to the concern of fines and red tape that they are overwhelmed with, when it comes to keeping culverts and water drainage areas maintained .I feel more wetlands and wildlife in NH could have been saved from the siltation an erosion that was caused in the flood events the past few years ,than if culvert repairs and maintenance was properly done in an as needed fashion.

Let me not forget to mention the devastating damages to Public and Private Property that was effected. The amount of time and money spent rebuilding and repairing the State of New Hampshire would have been minimized if they were maintained by the men and women who are in charge of keeping our beautiful State Safe for all of us to enjoy .

Now is the time for changes for all New Hampshire Road Agents and Public Works Managers to be able to make proper judgement calls for doing the job that they were hired to do. Maintain a Safe Infrastructure for the Citizens of New Hampshire, while also understanding the impact that could happen to Wetlands and Wildlife , if they did not do their jobs.

Thank you . Timothy Sweeney

Town of Bow

Timothey Sweeney
Director of Public Works
dpwdir@bow-nh.gov

10 Grandview Road
Bow, NH 03304
www.bow-nh.gov

Office (603) 228-2207
Shop (603) 228-1201
Fax (603) 228-2209

HB 621-FN-LOCAL – DRAFT AMENDMENT

STATE OF NEW HAMPSHIRE

In the Year of Our Lord Two Thousand Eleven

AN ACT relative to the authority of the department of transportation.

Be it Enacted by the Senate and House of Representatives in General Court convened:

1 Amend all after the enacting clause and replace it with the following:

Administrative Rules Suspended. Env-Wt 300-500-800, miscellaneous sections, "*Amendments Relative to Stream Crossings*" and Env-Wt 900, "*Stream Crossings*" are suspended.

Committee Established. There is established a committee to study whether certain rules adopted by the department of environmental services dealing with stream crossings.

2 Membership and Compensation.

I. The members of the committee shall be as follows:

(a) Two members of the senate, appointed by the president of the senate.

(b) Four members of the house of representatives, appointed by the speaker of the house of representatives.

II. Members of the committee shall receive mileage at the legislative rate when attending to the duties of the committee.

3 Duties. The committee shall study whether these rules 1) violate Article 28-a of the New Hampshire Constitution, Mandated Programs; and 2) have the underlying statutory authority for their promulgation. The committee may seek comment from experts as it deems necessary to complete its work.

4 Chairperson; Quorum. The members of the study committee shall elect a chairperson from among the members. The first meeting of the committee shall be called by the first-named senate member. The first meeting of the committee shall be held within 45 days of the effective date of this section. Four members of the committee shall constitute a quorum.

5 Report. The committee shall report its findings and any recommendations for proposed legislation to the president of the senate, the speaker of the house of representatives, the senate clerk, the house clerk, the governor, and the state library on or before November 1, 2011.

6 Effective Date. This act shall take effect upon its passage.

Voting Sheets

HOUSE COMMITTEE ON PUBLIC WORKS AND HIGHWAYS

EXECUTIVE SESSION on HB 621-FN-LOCAL-(2)

BILL TITLE: **relative to the authority of the department of transportation.**

DATE: March 10, 2011

LOB ROOM: 201

Amendments:

Sponsor: Rep. Jonathan S. Maltz — OLS Document #: 2011 0130

Sponsor: Rep. Mark McConkey — OLS Document #:

Sponsor: Rep. — OLS Document #:

Motions: OTP, (OTP/A), ITL, Interim Study (Please circle one.)

Moved by Rep. Mark McConkey

Seconded by Rep. Franklin T. Tilton

Vote: 15-0 (Please attach record of roll call vote.)

Motions: OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep.

Seconded by Rep.

Vote: (Please attach record of roll call vote.)

CONSENT CALENDAR VOTE: 15-0

(Vote to place on Consent Calendar must be unanimous.)

Statement of Intent: Refer to Committee Report

Respectfully submitted, Kevin Waterhouse

Rep. Kevin Waterhouse, Clerk

HOUSE COMMITTEE ON PUBLIC WORKS AND HIGHWAYS

EXECUTIVE SESSION on HB 621-FN-Local

BILL TITLE: relative to the authority of the department of transportation.

DATE: 2/11/11

LOB ROOM: 201

Amendments:

Sponsor: Rep. McNeil — OLS Document #: 2011-0180

Sponsor: Rep. McKinney — OLS Document #:

Sponsor: Rep. — OLS Document #:

Motions: OTP, (OTP/A), ITL, Interim Study (Please circle one.)

Moved by Rep. McKinney

Seconded by Rep. Tilton

Vote: 15-0 (Please attach record of roll call vote.)

Motions: OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep.

Seconded by Rep.

Vote: (Please attach record of roll call vote.)

CONSENT CALENDAR VOTE: Yes 15-0

(Vote to place on Consent Calendar must be unanimous.)

Statement of Intent: Refer to Committee Report

Respectfully submitted,

Rep. Kevin Waterhouse, Clerk

OFFICE OF THE HOUSE CLERK 2011 SESSION

PUBLIC WORKS AND HIGHWAYS

Bill #: HB 621-FN-A Title: Relative to the authority of the department of transportation.

PH Date: 02/24/11 Exec Session Date: 3/11/11

Motion: OTP/A Amendment #: 2011-0130

MEMBER	YEAS	NAYS
Chandler, Gene G, Chairman	✓	
Seidel, Carl W, V Chairman	✓	
Smith, Edwin O	✓	
Graham, John A	✓	
Gionet, Edmond D	✓	
McConkey, Mark E	✓	
Tilton, Franklin T	✓	
Waterhouse, Kevin K	✓	
Kolodziej, Walter	✓	
Buxton, Michael P	✓	
Maltz, Jonathan S	✓	
Smith, Molly J		
Terrio, Ross W	✓	
Bouchard, Candace C W		
Campbell, David B		
Long, Patrick T	✓	
Sprague, Dale R	✓	
Ramsey, Peter E	✓	
TOTAL VOTE: 15-0		

Printed: 1/4/2011

Committee Report

CONSENT CALENDAR

March 15, 2011

HOUSE OF REPRESENTATIVES

REPORT OF COMMITTEE

The Committee on PUBLIC WORKS AND HIGHWAYS to which was referred HB621-FN-L,

AN ACT relative to the authority of the department of transportation. Having considered the same, report the same with the following amendment, and the recommendation that the bill OUGHT TO PASS WITH AMENDMENT.

Rep. Mark E McConkey

FOR THE COMMITTEE

Original: House Clerk
Cc: Committee Bill File

COMMITTEE REPORT

Committee:	**PUBLIC WORKS AND HIGHWAYS**
Bill Number:	**HB621-FN-L**
Title:	**relative to the authority of the department of transportation.**
Date:	**March 10, 2011**
Consent Calendar:	**YES**
Recommendation:	**OUGHT TO PASS WITH AMENDMENT**

STATEMENT OF INTENT

This bill, as amended, expands the issuance of a permit by notification by the department of environmental services for the repair, replacement or maintenance of stream crossings and culverts from the present diameter limit of 36" to 48". Secondly as suggested by NH Municipal Association establishes a committee to study certain rules recently adopted by DES concerning stream crossings. The duty of the committee is to determine: 1.) if the above mentioned rules as adopted violates Article 28-a of the NH Constitution. 2.) If DES had the authority to implement those rules.

Vote 15-0.

Rep. Mark E McConkey
FOR THE COMMITTEE

Original: House Clerk
Cc: Committee Bill File

CONSENT CALENDAR

PUBLIC WORKS AND HIGHWAYS

HB621-FN-L, relative to the authority of the department of transportation. **OUGHT TO PASS WITH AMENDMENT.**

Rep. Mark E McConkey for PUBLIC WORKS AND HIGHWAYS. This bill, as amended, expands the issuance of a permit by notification by the department of environmental services for the repair, replacement or maintenance of stream crossings and culverts from the present diameter limit of 36" to 48". Secondly as suggested by NH Municipal Association establishes a committee to study certain rules recently adopted by DES concerning stream crossings. The duty of the committee is to determine: 1.) if the above mentioned rules as adopted violates Article 28-a of the NH Constitution. 2.) If DES had the authority to implement those rules. **Vote 15-0.**

Original: House Clerk
Cc: Committee Bill File

HB 621-FN-Local relative to the authority of the department of transportation.

This bill, as amended, expands the issuance of a permit by notification by the department of environmental services for the repair, replacement or maintenance of stream crossings and culverts from the present diameter limit of 36" to 48". Secondly as suggested by NH Municipal Association establishes a committee to study certain rules recently adopted by DES concerning stream crossings. The duty of the committee is to determine: 1.) if the above mentioned rules as adopted violates Article 28-a of the NH Constitution. 2.) If DES had the authority to implement those rules.

Rep. Mark McConkey
For the Committee
15-0 OTP/A <2011-0130> CC

HB 621-FN-Local relative to the authority of the department of transportation.

This bill, as amended, expands the issuance of a permit by notification by the department of environmental services for the repair, replacement or maintenance of stream crossing and culverts from the present diameter limit of 36" to 48". Secondly as suggested by NH Municipal Association establishes a committee to study certain rules recently adopted by DES concerning stream crossings. The duty of the committee is to determine: 1.) if the above mentioned rules as adopted violates Article 28-a of the NH Constitution. 2.) If DES had the authority to implement the rules.

Rep. Mark McConkey
For the Committee
15-0 OTP/A <2011-0130> CC

GMC

HB 621 as Amended expands The issuance of a Permit By Notification, By the Dept. of Env. Servs ~~for~~ or The Repair, Replacement or Maintainance of Stream crossings & Culverts from the present Diameter limit of 36" ~~to Diameter~~ to 48".

Secondly as, suggested By N.H. Municipal Association establishes a Committe to study certian Rules recently adopted By DES. concering stream crossings.

The duty of The Committie is to Determine

1) If The above mentioned Rules as adopted: Violates Artical 28a of The NH. Constitution ~~and if~~

2) If DES had The authority to impliment Those Rules

Submitted By ~~the~~ Rep McConkey for The Committe of Public Works + Hyhways

Motion O.T.P. 16?-0

520-8275 MARK McConkey

COMMITTEE REPORT

COMMITTEE: Public Works and Highways

BILL NUMBER: HB 621-FN-L

TITLE: Relative to the authority of the department of transportation.

DATE: March 9, 2011 CONSENT CALENDAR: YES [X] NO [ ]

- [ ] OUGHT TO PASS
- [X] OUGHT TO PASS W/ AMENDMENT
- [ ] INEXPEDIENT TO LEGISLATE
- [ ] INTERIM STUDY (Available only 2nd year of biennium)

Amendment No. 2011-0130h

STATEMENT OF INTENT:

See Blurb Attached

COMMITTEE VOTE: 15-0

- Copy to Committee Bill File
- Use Another Report for Minority Report

RESPECTFULLY SUBMITTED,

Rep. Mark McConkey
For the Committee

Rev. 02/01/07 - Yellow