

***Designing for Aquatic Organism Passage at Road-Stream Crossings
Bedford, Indiana (23 to 27 October 2017)***

Course Objectives

Provide engineers, biologists, hydrologists, and other engaged disciplines the necessary skills to design road-stream crossing structures that will accommodate aquatic organism passage, provide for more natural channel function, and maximize the long-term stability of the structure. The primary design approach is stream simulation.

Monday, October 23

8:30	Welcome and Introductions	TBD
8:40	1. Course structure and objectives	Dale Higgins
9:00	2. Why is ecological continuity at road-stream crossings important?	TBD
9:30	3. History of road-stream crossing design approaches and a simple stream simulation example	Mark Weinhold
10:15	Break	
10:25	4. Fluvial processes and channel characteristics important in stream simulation design	Dan Cenderelli
12:00	Lunch	
1:00	5a. Site assessment: Field measurements and interpretations <ul style="list-style-type: none">• Site maps, channel planform characteristics, longitudinal profiles	Dan Cenderelli
2:00	Break	
2:10	5a. Site assessment: Field measurements and interpretations <ul style="list-style-type: none">• Site maps, channel planform characteristics, longitudinal profiles (continued)	Dan Cenderelli
3:00	Break	
3:10	<i>Exercise 5a. Introduction to exercise and data: Schafer Tributary. Interpreting geomorphic site assessment data: Channel planform and longitudinal profile</i>	Dan Cenderelli All instructors
5:30	Adjourn	

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Tuesday, October 24

8:00	5b. Stream simulation design <ul style="list-style-type: none">• Reference reach concept, project alignment and profile, site suitability for stream simulation	Mark Weinhold
9:10	Break	
9:20	<i>Exercise 5b. Design project profile and alignment</i>	Mark Weinhold All instructors
10:50	Break	
11:00	6a. Site assessment: Field measurements and interpretations <ul style="list-style-type: none">• Channel cross sections and bed material interpretations	Dan Cenderelli
12:10	Lunch	
1:10	<i>Exercise 6a. Interpreting geomorphic site assessment data: Channel cross sections and bed material interpretations</i>	Dan Cenderelli All instructors
2:20	Break	
2:30	6b. Stream simulation design <ul style="list-style-type: none">• Bed material size and arrangement	Bob Gubernick
3:40	Break	Break
3:50	<i>Exercise 6b. Design bed mix, key features, and bed/bank margins</i>	Bob Gubernick All instructors
5:00	Adjourn	

Wednesday, October 25

8:00-5:00	Field Trip	All instructors
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Thursday, October 26

8:00	7. Structure selection and design considerations	Bob Gubernick
9:00	<i>Exercise 7. Structure type selection</i>	Bob Gubernick All instructors
9:50	Break	
10:05	8. Flood hydrology, discharge estimates, and culvert capacity	Dale Higgins
10:45	9. Sediment entrainment and bed mobility/stability analysis	Mark Weinhold
12:00	Lunch	
1:00	<i>Exercise 9: Bed mobility/stability analysis</i>	Mark Weinhold All instructors
2:15	Break	
2:25	10. Final design and contract preparation	Bob Gubernick
3:20	<i>Exercise 10. Final design bed material specifications</i>	Bob Gubernick All instructors
3:50	Break	
4:00	11. Construction	Bob Gubernick
5:00	Adjourn	

Friday, October 27

8:00	12. Monitoring	Mark Weinhold
8:30	13. Lessons learned from a few case studies	Mark Weinhold
9:00	Break	
9:15	<i>Schafer Tributary Exercise: Group presentations and discussion</i>	Dan Cenderelli All instructors
12:15	Wrap-up	
12:30	Adjourn	