

ES458/558 Small Group Worksheet
Landscape Analysis Harpham Flat to Maupin City Park

You will experience the last leg of your raft excursion on the Deschutes River this afternoon, floating from Harpham Flats to Maupin City Park. The objective of this worksheet is to make observations of the river landscape around you, and place those observations in the context of rafting dynamics.

Examine the two topographic map sheets that cover the Deschutes River reach from Harpham Flat to Maupin (pages 173C and 173D). You will be floating through Wapinitia and Boxcar rapids on this stretch. Working in small groups, use the attached topographic maps and your own field observations to answer the following questions.

1. Standing at Harpham Flats, make landscape observations, before boarding the rafts:
 - a. In which direction is the Deschutes River flowing?
 - b. Do you see layers of bedrock exposed on the hillslopes of the canyon walls, look both to river left (west) and river right (east).
 - c. Are the hillslopes on river left and river right equally as steep? Are they equally as high from the valley floor to the observable canyon rim? Which side would be easier to hike up to the canyon rim?
 - d. Is there abundantly thick soil and vegetative cover on the hillslopes? Or are they sparse and thin?
 - e. What is your general sense of the climate in this region? Dry or wet? What are your indicators?
 - f. What type of earth material are you standing on at Harpham Flats: hard bedrock or loose unconsolidated sediment? If the latter, what is the dominant size: sand? Pebbles? Cobbles? Boulders?
 - g. How wide is the valley-bottom of the Deschutes River in this area? Greater than 1 mi? Between 2000 and 3000 feet? Between 1000 and 2000 feet? Less than 1000 feet?
 - h. How deep is the river channel? Which of the following best describes the river hydraulics you observe: highly turbulent white water, flat “lake water”, swiftly flowing pools and riffles?
 - i. What is the flow volume (i.e. “Discharge”) of the Deschutes like today? Almost dry? Low? Medium? High? Flood stage?

- j. What is the water temperature like today? Hot tub? Warm? Cold and refreshing?
- k. It is now late July in central Oregon, the dry fire season. Given this fact and your answers in 1e, 1i, and 1j above, does the river discharge seem like it matches what you might expect given the climate and season in central Oregon? Explain your reasoning.

2. Floating through Wapinitia and Boxcar rapids:

- a. Note the hillslopes on river left and river right. Do you see traceable layers of bedrock exposed on the hillslopes of the canyon walls on each side? If not what type of material do you see?
- b. Looking at the topographic map, what do you observe about the contour line patterns and river left? Even and parallel or wavy and irregular?
- c. Are the hillslopes on river left and river right equally as steep? Are they equally as high from the valley floor to the observable canyon rim? Which side would be easier to hike up to the canyon rim?
- d. When floating through the rapids, what types of physical barriers caused the whitewater turbulence that you experienced? Rock-layer water falls? Large boulders? Large log jams?
- e. Which of the following best describes the river hydraulics you observe: highly turbulent white water, flat “lake water”, swiftly flowing pools and riffles?

3. Floating from Boxcar back to Maupin City Park:

- a. Note the hillslopes on river left and river right. Do you see traceable layers of bedrock exposed on the hillslopes of the canyon walls on each side? If not what type of material do you see?
- b. Looking at the topographic map, what do you observe about the contour line patterns and river left? Even and parallel or wavy and irregular?
- c. Are the hillslopes on river left and river right equally as steep? Are they equally as high from the valley floor to the observable canyon rim? Which side would be easier to hike up to the canyon rim?
- d. How deep is the river in this stretch? Which of the following best describes the river hydraulics you observe: highly turbulent white water, flat “lake water”, swiftly flowing pools and riffles?

4. Based on your observations above, write a two-paragraph summary hypothesizing what geologic materials and processes are controlling the hillslope morphology on this river stretch, and what processes have resulted in the creation of Boxcar and Wapanitia rapids.