Analyzing Long-Term Data

In Oregon, cutthroat trout make streams their home. During floods, water flows very fast, causing sediment from the bottom of the stream to move around. When sediment is floating in the water, trout have a harder time seeing, eating, and breathing. Young, juvenile trout also have a hard time swimming in such strong currents.

Although floods can be dangerous for trout, they are important for creating new habitat. Floods make streams wider and add more space. Floods also move boulders, small rocks, and logs into the stream, adding new places for trout to hide.

Researchers at the H.J. Andrews Experimental Forest are collecting data on cutthroat trout populations after winter flood events. Specifically, researchers want to know whether floods impact the survival of trout. Since flooding can make life difficult for trout, they expected trout populations to decrease after major flooding events.

To study how floods affect trout populations, researchers used three sets of data:
Juvenile trout population size
Adult trout population size
Stream discharge (Liters of water per second)

Researchers decided to look at the population size of both juvenile and adult trout since they occupy such different parts of the stream. Adult trout live in pools near the center of streams. Juvenile trout prefer habitats at the edges of streams that have rocks and logs where they can hide from predators and swim in slower water.

In order to answer their question, researchers compared trout population data with stream discharge data. Stream discharge is a way to describe how fast water was flowing in the stream. Stream discharge is higher after flooding events.

Will trout populations decrease after high stream discharge? Graph the data to find out!

Materials needed:

- Printed graph templates (attached)
- Pencil

Step-by-step instructions:

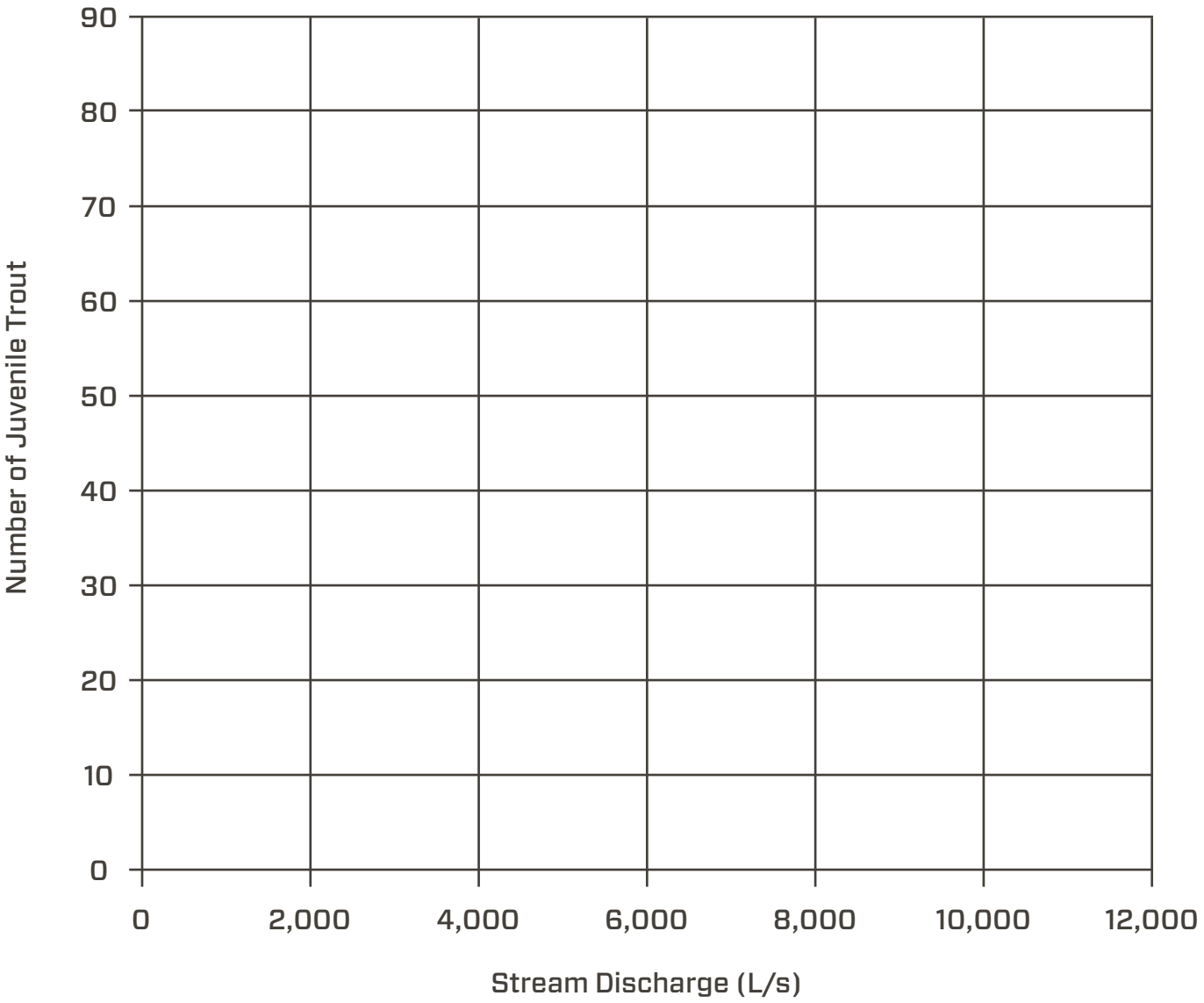
1. Read the atatched “Trout Study Background” data set.
2. Print blank graph templates.
3. Using the data set, graph juvenile trout populations against stream discharge.

Trout Study Background

Year	Number of Juvenile Trout	Number of Adult Trout	Stream discharge (L/s)*
1987	26	53	2373.2
1988	18	35	3920.0
1989	18	35	3832.5
1990	22	59	6685.4
1991	44	47	3894.1
1992	33	53	3940.7
1993	44	58	4324.4
1994	31	67	2864.5
1995	38	52	4767.5
1996	81	52	9793.2
1997	81	60	7200.0
1998	73	80	5240.1
1999	41	61	5942.3
2000	43	56	9557.2
2001	26	70	1525.6
2002	36	48	5858.4
2003	66	42	4784.8
2004	44	55	4517.9
2005	30	68	4704.4
2006	48	64	6950.7
2007	68	58	6943.7
2008	37	80	4226.7
2009	83	70	6398.7

Trout Study Background

Use this template to graph the number of juvenile trout against stream discharge:



Trout Study Background

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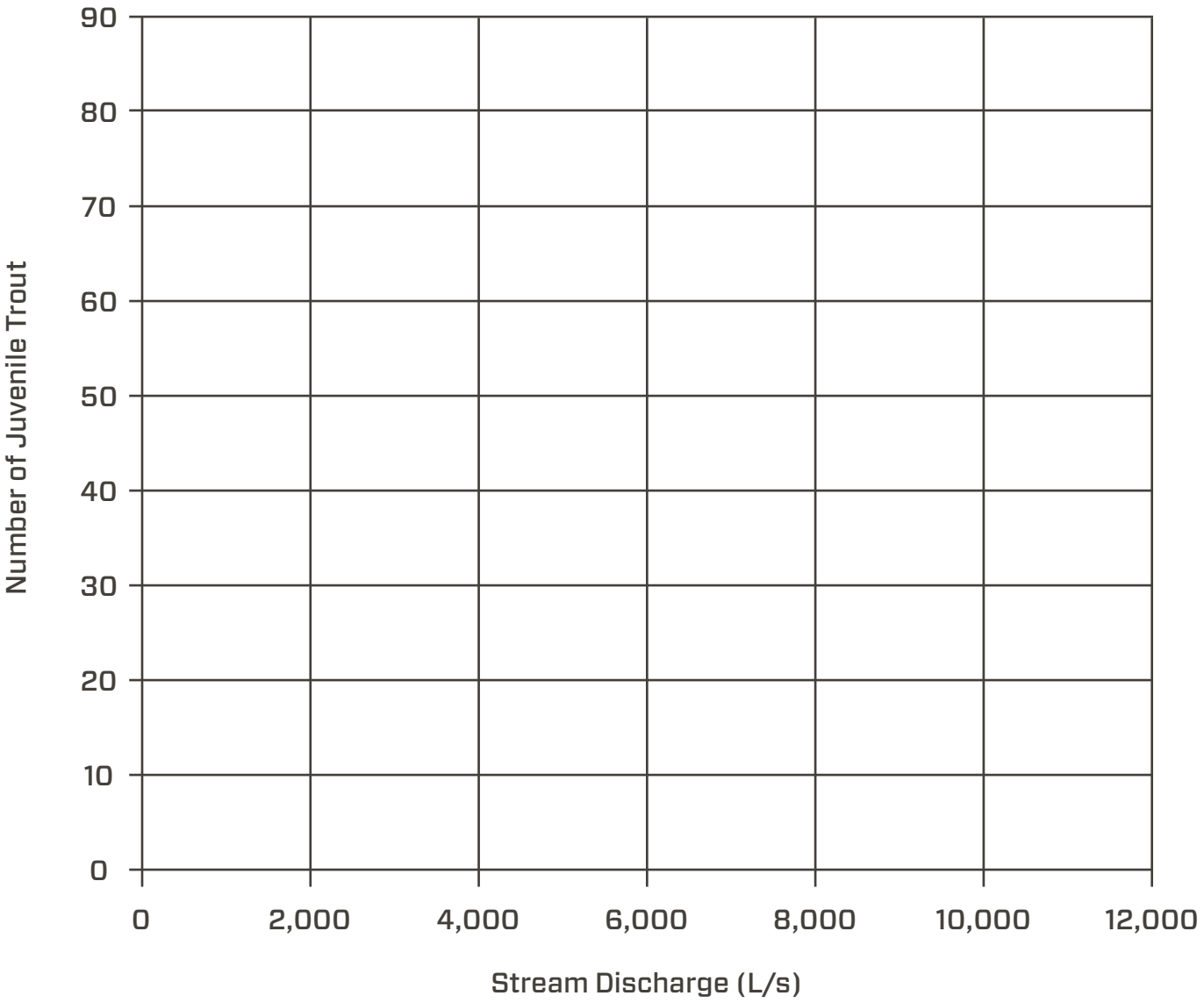

Additional explorations:

- This activity was based on data and a lesson plan from Data Nuggets
  http://datanuggets.org/?s=trout

Discussion questions:

- Do you think flooding events affected trout populations?
- Did floods cause adult or juvenile trout populations to decrease? Increase? Why do you think that happened?
- Could you graph the data differently? How?