Ecological sampling

Please answer the following questions:

1. You are working in an agroforestry system attempting to understand where a species of finch occurs across this landscape. The habitat is patchy, with forests comprising 80% of the landscape and fields covering the remaining 20%. You decide to use random stratified sampling to capture finch occupation in both systems proportionally. Given this, how many of your 40 plots will occur in forested habitat? Select one:

    A. 20
    B. 30
    C. 32
    D. 38

2. You are interested in how the abundance of frogs varies across habitats moving away from a local stream. To look at frog abundance as a function of distance from stream, you:

    A. Place 1m^2 quadrats along the stream bank.
    B. Create a grid along stream habitat and randomly assign plots to occur within the grid cells.
    C. Place a 50 m transect running perpendicular to the stream, starting at the stream bank and moving away.
    D. Place a 50 m transect along the stream parallel to the running water.

3. Which of the following sampling schemes will have the lowest sampling error? Select one:

    A. plot per hectare
    B. 5 plots per hectare
    C. 10 plots per hectare
    D. Unable to determine using this information

4. List the data type for each variable below (continuous, nominal):

    - Growth: _____
    - Survival (yes, no): _____
    - Foliar nitrogen content: _____

Once you finish, go with your TA to Sinclair Wash and complete the following activity:

We are going to monitor the impacts of the **Rio de Flag Flood Control Project** on the recovery of Sinclair Wash (also called Clay Avenue Wash) to be compiled over time and provided to the City of Flagstaff. This project has the dual benefit of restoring important ecological habitat along the Rio de Flag, as well as reducing flood risk in historically minority neighborhoods in Flagstaff. The project is a collaboration between the City of Flagstaff and the US Army Corps of Engineers and is projected to take 20 years to complete and cost $122 million dollars.

There are several nice resources to learn about this project, including this resource page. Please watch the following informational video on the project (feel free to watch in groups): A Southside Story. Also, please visit the city project page.

Once you have looked over this information and the downloads provided, if the weather allows, walk out to Sinclair Wash and orient yourself to the site. Walking directions. If the weather is poor, check out what the wash looks like on google and use this view to create your plan. Navigate to the Aerial view of Sinclair Wash, and zoom in until you can see the Rio, which follows the tree line and path (path is hard to see here). Create your plan - you can even import a screenshot into powerpoint or use other applications to map out your sampling strategy.

The question: How are restoration efforts affecting the vegetation along eroded banks along Sinclair Wash?

Write a sampling strategy to address this question**.** Make sure to address how you will incorporate a **control** into your experiment **and identify your target predictor variable and response variable. What data will you actually be collecting, and how will that answer this research question? How would you assess the success of the restoration?**

Components to include (you must address each of these points to get full credit on this assignment):

1. **Explain how you would make sure to collect a representative sample.**
2. **How would you incorporate a control into your study?**
3. **How do you plan to reduce sampling *bias*?**
4. **How do you plan to reduce sampling *error*?**
5. **Your target predictor and response variables (draw a graph of a hypothetical predicted result. What relationship do you expect? Hint: this would likely be a bar plot or)**
6. **Shapes and sizes of your sampling plot/quadrat.**

Draw or make a map of your sampling strategy (on provided paper)