

## EXHIBIT A

The habitat improvements described below are agreed to by Institute of American Indian Arts (IAIA), Landowner(s)], the USFWS, New Mexico Community Foundation in a Landowner Agreement dated [09 / 20 / 2022].

### **Description of Habitat Improvement Project and Objectives:**

The objective of this project is to help improve the ecology and biodiversity of the Institute of American Indian Arts (IAIA) campus, and to support outdoor educational programming at the school.

Specific habitat improvement projects across the IAIA campus includes:

- 1) Reducing water and wind erosion
- 2) Increasing water conservation
- 3) Increase the biodiversity of native plants (trees, shrubs, grasses, seeds, etc)
- 4) Increasing healthy soil production
- 5) Improving experiential learning and curriculum development

### **Reducing water and wind erosion**

The biggest issues affecting the health of the land on IAIA campus is erosion (caused by both water and wind). Figure 1 below show two examples of what this erosion typically looks like across campus.



Figure 1. Two Examples of Erosion (both are head-cuts)

There are various ways to help reduce the head-cuts from getting deeper and more severe, which essentially boils down to creating some structure on the ground above (or up gradient) these head-

cuts, which act to slow down the storm water runoff and providing some physical blocking of the sweeping winds.

While this document is a living document, and because there are so many areas of erosion across campus we propose focusing this rock work on several locations of the campus, focused on the up-gradient, or highest elevation areas, which will make a major contribution to helping the land heal itself, and fill the barren head-cut with vegetation.

Across the campus (Figure 2), where the watersheds are relatively flat (eastern area around Hogan, western area near parking lot and dorms, etc), we plan to build a series of grid gardens, one of many Pueblo techniques of caring for the land (see Figure 3).

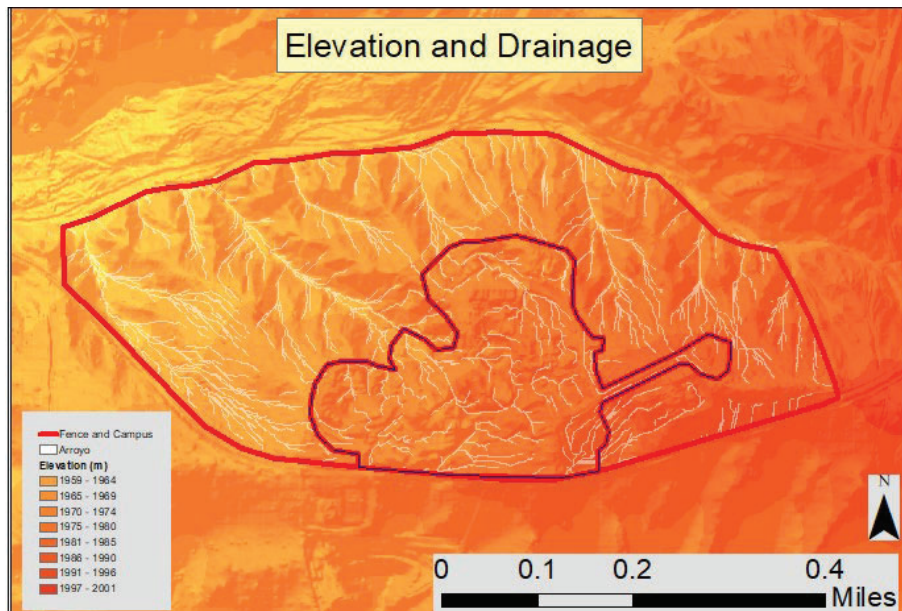


Figure 2. Overview of IAIA campus water shed drainages (the inside fenceline is the built campus)

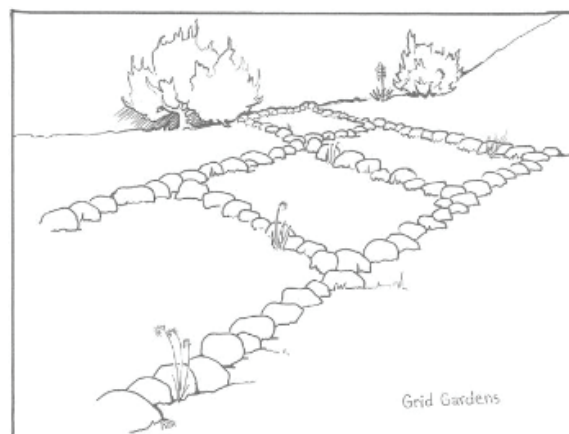


Figure 3. Grid Gardens

The borders of these grid gardens are made with ~2' rock and hardy plants (ie cholla cactus) and act as mini sponges or drainages to slow down the flow and accumulation of water during significant rain events, allowing the water to sink in the earth rather than rapidly accumulate in the

arroyo. They also act to prevent wind damage, especially if cactus or other plants are used as part of the grid garden borders.

As we move north across the campus (Figure 2), the watersheds become steeper. Along these steeper parts of campus we will look to place one rock damns across arroyo, and possible shaving back existing headcuts and reseeded, and doing zuni bowls or other rainwater harvesting features, such as contour terracing, media lunas, and other features.

Rainwater harvesting across the campus, especially at the flatter “top” of the watershed, will allow water to slow down and seep in the earth, reducing the process of erosion and letting vegetation establish themselves. All these features can also be strategically placed to work with the new walking path, which will highlight this work for people passing by, as well as be artistic and creative. We propose that the grid gardens work start with the eastern and western areas of campus as they are easily accessible to people and to stage materials (ie seeds, rock, etc).

#### Increasing water conservation

In addition to the storm water practices mentioned above in the undeveloped areas of the campus, this project will implement more rooftop harvesting of stormwater within the built areas of campus. This involves harvesting rainwater from rooftop gutters and storing this water in above ground and/or below ground tanks where feasible (Figure 4). This work will also include servicing and reviving existing above and below ground storage tanks that already exist on campus (Figure 5). The placement of these tanks will help the land-grant program develop additional garden/growing space or supplemental water for existing growing spaces. The details, design, and planning will be developed with a rainwater harvesting contractor and relevant IAIA departments.



Figure 4. A tall building with a large metal cistern to collect stormwater runoff from the roof. From the Environmental Protection Agency.





Figure 5. Existing rainwater tanks with below ground tanks in foreground (only shown are tanks access points).

#### Increase the biodiversity of native plants

Much of the earth and rockwork across the campus, which helps slow and sink and spread the stormwater will allow vegetation to get reestablished in eroded areas. In addition, various structures can be seeded and planted with grasses and forbs, and shrub species, and some of the rooftop harvested water can also go toward watering additional plants closer to the built campus. The greenhouse on IAIA's campus will be used if required to start plants early, and also to develop local seed sources of native plants if and when feasible.

#### Increasing healthy soil production

Besides the rock and earth work to reduce erosion, there are additional steps to produce healthy soils on campus. One is protecting area that already have lots of biocrust, also called cryptogammic crust, which essentially acts on the earth as a scab acts on our skin. Biocrusts are made up of algae (which you can see in the photo), fungi, and many other soil microorganisms, and are one of many amazing examples of symbiosis in action (Figure 6). This living skin is the first sign of land healing itself, and is actually the first step of soil creation in desert areas limited by water and nutrients.



Figure 6. Close up IAIA's living and healing skin

As such, these areas need to be protected, and designated as such. Temporary signage, or some form of signage, map, etc. should be put up alert people that these areas should be avoided. During the UNM class project, they made the following map of areas that need such protection (Figure 7). In addition, there are things we can do to encourage biocrust to spread in areas that are disturbed (and that will get disturbed from our restoration work) but we will have to research this application more.

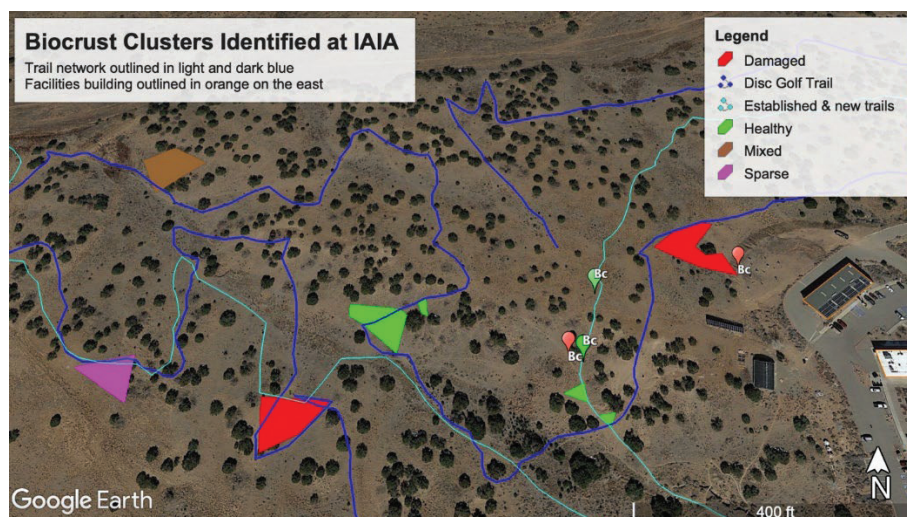


Figure 7. Biocrust mapping and delineation done by the UNM class. Small patches of healthy biocrust were identified but there were large areas where the biocrust was damaged or sparse.

### Improving experiential learning and curriculum development

In general, all of the aforementioned work (ie. grid gardens, rock dams, rainwater harvesting tank installation, biocrust soil protection mapping and signage, etc) are all perfect learning work projects. The grid gardens, in particular, would be an excellent community educational hands-on learning event hosted by the Land Grant program at IAIA. This educational event would be an opportunity to share this work with the rest of the campus and outside community, and could be an excellent community developing experience. The work will be continued throughout the year in smaller work crews they have during the summer and school year.