Blacktail Deer Data Analysis

ESSENTIAL UNDERSTANDINGS

- Sovereignty
- Lifeways
- Treaties w/ the US

LEARNING OUTCOME

- Students will be able to determine the number of blacktail deer tags the Grand Ronde tribe should issue to keep deer population and habitat healthy on the reservation.

ESSENTIAL QUESTION

- How can we determine the number of deer tags the Grand Ronde Tribe can issue to keep the deer population and habitat healthy?

CULTURALLY RESPONSIVE PRACTICES

- Connecting to the lives of students
- Proximity
- Preserving and honoring cultural history
- Student talk, working together and individually

ASSESSMENT

Students will be assessed on their participation in classroom discussions and their proficient completion of the 4 Quadrant Organizer.

Overview

Monitoring and maintaining the animal populations on the CTGR Reservation is a key concept in maintaining a thriving ecosystem. In this lesson, students will analyze, discuss, and ask questions about an authentic statistical table of data regarding blacktail deer population on the Grand Ronde reservation.

MATERIALS

- Blacktail deer data
- Blacktail Deer Background Knowledge for students
- Butcher paper or chart paper
- Examining Data Presentation
- 4 Quadrant Organizer
- Video Notes Part 1
- Computer and projector

LOGISTICS

- Where does this activity take place? **Classroom**

- How are the students organized?

  Whole Class   **Pairs**

  Individually

TIME REQUIRED

50 minutes

VOCABULARY

- **Sovereignty-** inherent authority of indigenous tribes to govern themselves within the borders of the United States**.**
- **Genotypes-** the genetic makeup of an organism.
- **Alleles-** one of the possible forms of a gene. Most genes have two alleles, a dominant allele, and a recessive allele.

Background for Teachers

The Confederated Tribes of Grand Ronde has been working towards regaining and retaining hunting and fishing rights for tribal members since 1983 when the tribe was restored with federal recognition. Today, the tribe has a Natural Resources Department (NRD) that "serves the Grand Ronde tribal membership through responsible stewardship of all-natural resources important to the cultural identity, self-sufficiency, and **sovereignty** (inherent authority of indigenous tribes to govern themselves within the borders of the United States) of current and future generations." Hunting and fishing rights are important to the tribe because it helps promote land management, land conservation and also allows the tribe to continue to practice cultural ceremonies and activities.

The purpose of this study is to obtain reliable blacktail deer population estimates to help the tribe determine how many additional hunting tags should be distributed to tribal members. Currently, the tribe nor the Oregon Department of Fish and Wildlife have an estimate on the deer population in Oregon. The Trask hunting unit is on reservation land and is open to the public. Over distributing hunting tags in the Trask unit could potentially have a negative effect on the habitat on the reservation.

A panel of seven microsatellites and two sexing markers were used to screen all 269 samples. Of the 269 samples, 89 (33%) produced data at five or more loci in Panel 1. Forty samples (15%) failed at all loci, and the remaining 140 samples (52%) amplified at 1-5 loci. The 89 samples that amplified at ≥5 loci were identified as 56 unique deer, of which 40 were female and 16 were male (1 male: 2.5 females). In addition to the 19 deer that were recaptured within the 2017 data set, several deer sampled in 2017 were previously sampled in 2015 and/or 2016. For the sake of this lesson, we will be using table 2, which gives information on 89 samples that were collected.

A team from NRD was assembled to go out on the reservation to collected fresh deer pellets. The surveyed area consisted of habitats that were freshly logged or the trees were only 0-5 years old. The team covered 403 acres of land. The attached excel sheet labeled 2017 Node Locations. The map shows where each node plot is and how many pellets were collected from that node.

In addition to microsatellite loci, each panel contained 2 markers for sex identification. The markers are repeated twice because you get two genes on the allele, one from each parent. The sample ID's (example BTD17.001) represent the fecal samples that were collected. BTD stands for blacktail deer, while the number 17 stands for the year the data was collected, i.e. 2017. The last three digits indicate the sample number. You will notice that there are some missing samples. That is because not all of the samples that were collected were blacktail deer or the quality of the sample wasn't complete enough to determine it's species. The data on table 2 represents all complete locus, which was only 33% of that data.

The data in the body of the excel sheet show the specific alleles the microsatellite primers target. Meaning if that allele shows up, we know it's a blacktail deer and that the number is unique to that individual. For example, BTD17.001 matches BTD17.005 which shows us that it's the same deer because their alleles are the same. The alleles also show us which deer are male and which ones are females. This helps us identify the ratio of female to male deer on the reservation.

Opening

Hand out the data sheets to students. Using 5 minutes for individual think time, ask students to record as many things as they can about the data. *What do they notice? What do they wonder about?*

Activity

1. Have students form groups of 4 to share their thinking. Assign each student as 1, 2, 3, and 4. As they share, have students record on a t-chart what they noticed and what they wondered.
   a. Student 4 will write on the "notice" side
   b. Student 3 will write on the "wonder" side.
2. Come back together as a whole group and begin whole class discussion. Record what the class as a whole noticed and wondered so that everyone can see the information.
   a. Have Student 2 in each group share out what their group noticed
   b. Have Student 1 in each group share out what questions their group had
3. Read the background information on this study. The information has been divided into four paragraphs. Each person in a group of 4 gets a different paragraph. Allow time for students to read their section. Have students circle any vocabulary they don't understand and write questions or important information in the margins or on the back of the section.
4. Assign each corner of the room a number (1-4). Have students go to corners based on the paragraph of the article they read. Allow students time to discuss their information. Have them jot down what new information they learned and the answers to any questions generated by the class previously.
5. Students will return to their table groups (original groups of 4) and share the information from their discussions and reading.
6. As a table group, students will fill out a 4-quadrant poster. In each quadrant they will answer one of the following questions:
   a. *Where and by whom was this data collected?*
   b. *How was it collected?*
   c. *What was the purpose of the data?*
   d. *How was it analyzed?*
7. Play "[Part 1 Interview with Lindsay Belonga, Grand Ronde Biologist](#)". Have students take notes using the Video Notes Document.
8. Have students add relevant questions and create a summary of what they know now about the data to process what they learned today.

Closure

Students share their 4-quadrant posters with the class.

Differentiation

- If students do not feel comfortable working with a small group, this lesson can be completed independently.

Extension

- **Anticipatory Set Suggestion - make an artifact box that includes things that relate to the blacktail deer study.** Students would explore the artifact box before being given the background knowledge information and datasheet. Items could include but are not limited to; map of Trask unit, map of Grand Ronde reservation, a short video clip about the Grand Ronde tribe, collection containers, a small bottle/sample of 95% ethanol, items related to the habitat, deer pellets, video clip from Grand Ronde Biologist Lindsay Belonga, etc.

Notes/Other

Jan Michael Looking Wolf's or Grand Ronde Canoe Family audio tracks can be played as background music while students are working. These audio tracks can be found on Spotify or Apple Music.

Jan Michael Looking Wolf: Spotify and Apple Music
Grand Ronde Canoe Family: Spotify and Apple Music

Appendix

Blacktail deer data:
https://drive.google.com/file/d/1ebvcIvkin0K8Qxq8X2NEfu7GXM-PVopy/view?usp=sharing

Blacktail Deer Background Knowledge for students:
https://drive.google.com/file/d/1z4Ch5-HMOCgGO9r-nLUMcEPNbPsDQPCF/view?usp=sharing

Blacktail Data Presentation:
https://docs.google.com/presentation/d/1QzjjqNPj-DdlRCoLhHvQcfYxm2ssnmZja6enoR_KzEU/edit?usp=sharing

4 Quadrant Organizer:
https://drive.google.com/file/d/1h8fPCTjZwzq-4V8fNev-gLi2nhJf6Cnu/view?usp=sharing

Video Notes Part 1:
https://drive.google.com/file/d/1brv8ZL4z-kP-s0ZOekTMWZZPKUbHGKnr/view?usp=sharing