Beaver status, coexistence, and conflict within the Chehalis Basin

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Abstract: Beavers modify landscape morphology and hydrology, thereby creating habitat for diverse species, enabling many ecological processes, and promoting climate change resiliency. Beavers are now rebounding from near extirpation in North America and increasing beaver populations can facilitate restoration goals given beavers' roles as ecosystem engineers. This is especially relevant in the Chehalis Basin in western Washington where beaver is a focal species in the Aquatic Species Restoration Plan (ASRP) which aims to protect and restore critical aquatic habitat. Although beaver can be valuable for restoration, they can also cause conflict with people by damaging trees, flooding roads, etc. Given potential conflict and the role of beaver in restoration, we surveyed landowner perceptions of beaver and collated data on the status of beaver in the Basin. Our landowner survey provides information to begin assessing the Chehalis Basin community's understanding of and desires for beaver. Our study explicitly explored whether negative attitudes towards beaver are positively correleated with an individual's reported conflict with beaver. Notably, we found that landowners experiencing conflict with beaver were more likley to agree with lethal control of beaver and disagree with maintaining beaver-created habitat than landowners not experiencing conflict. This survey's results underscores how proactively addressing human-beaver conflict in the Basin is crucial for avoiding increasing negative attitudes towards beaver and beaver-related restoration. Our survey supports a need for outreach and education on beaver conflict mitigation, particularly related to unwanted tree removal. We also present trends data on recreational beaver trapping in the region and areas of reported beaver conflict. Although robust beaver population data are lacking, we provide a compilation of known beaver occurrences as a baseline for beaver activity, especially near restoration priorities. These beaver status data, in conjunction with our landowner survey data, provide a comprehensive picture of the state of beaver, beaver conflict, and beaver restoration in the Chehalis Basin. Our findings can help guide restoration practitioners in the Chehalis Basin to best capitalize on beaver's habitat restoration potential while mitigating conflict now and into the future.

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Introduction

Beaver

Once nearly extirpated from North America and Europe due to intensive land use and the fur trade following European settler-colonization, the North American beaver (*Castor canadensis*) is now rebounding (Larson & Gunson 1983; Whitfield et al. 2015; Michal Wrobel 2020). Because they extensively modify stream morphology and hydrology, beavers are ecosystem engineers that greatly impact their environment. Beaver activity has a wide range of ecosystem impacts including increased avian and amphibian species diversity and abundance, stream temperature buffering that supports habitat for sensitive salmonids (especially for coho salmon and steelhead), reversal of stream channel incision, increased ground water recharge, and an increase in open water availability during dry summer months and drought (Leidholt-Brune et al. 1992; Pollock et al. 2004; Westbrook et al. 2006; Hood & Bayley 2008; Johnson & Riper 2014; Bouwes et al. 2016; Puttock et al. 2017; Weber et al. 2017; Fairfax & Small 2018; Westbrook et al. 2020). Despite these benefits, there is a concern surrounding possible increases in negative interactions between beaver and people as beaver populations increase and land development expands. Such negative interactions include flood damage to infrastructure and unwanted vegetation removal. A pressing issue in conservation and restoration practice is how to balance the return of beavers and beaver-associated ecosystem benefits with human tolerance of beaver activity as both human and beaver populations continue to expand. Here, we survey landowners in the Washington's Chehalis Basin to understand conflict landowners experience with beaver, what landowner perceptions of beaver and beaver-associated restoration are, and how community attitudes towards beaver can guide education, outreach, and restoration efforts that improve aquatic habitats and flood damage. We couple this survey with compiled information on incidental beaver sign and trapping data to highlight where beaver currently occur and how beaver may increase in the region.

The Chehalis Basin

The Chehalis Basin (Figure 1) is home to a growing population of over 140,000 people (2000 US Census) and spans four counties (Grays Harbor, Mason, Lewis, and Thurston) in Western Washington. Large-scale flooding events have impacted the area for years (Mote et al. 2007). One of the most notable recent events was the flood of 2007 which deluged over 0.3m (~ one ft) of rain into the Basin over two days. Consequently, over 300 Chehalis Basin residents were displaced from their homes, prompting the deployment of numerous first responders including the Coast Guard to aid rescues. For four days, 32 km (20 mi) of Interstate-5 were closed due to floodwater spilling onto the roadway (Mote et al. 2007). These massive flooding events have historically been caused in significant part by Atmospheric River (AR) events that are becoming more frequent due to climate change (Warner et al. 2015). Precipitation will increase in the form of AR events, as factors that induce these massive rain events will reach their all-time highs 290% more frequently by the year 2100 (Warner et al. 2015). Long-term flood damage reduction is thus a priority for the Chehalis Basin.

To coordinate the efforts surrounding flood damage reduction and aquatic restoration, the Washington legislature created the Office of Chehalis Basin. The Office of Chehalis Basin has co-produced with regional experts the Aquatic Species Restoration Plan (ASRP) to conserve and restore aquatic species and habitats (ASRP 2019). The ASRP acknowledges that beaver can help achieve the goal of ensuring that aquatic species remain stable and resilient. Restoring beaver and beaver function in the Chehalis Basin would likely have cascading benefits for ecosystems, biodiversity, and in mitigating flood damage. However, leveraging these beaver benefits also necessitates an understanding of beaver-human conflict.

The Basin also provides crucial wetland habitat for many organisms that hold intrinsic, economic, and ecological value to local communities (ASRP 2019). As the largest watershed wholly contained within Washington state, the Chehalis Basin is home to a mosaic of diverse amphibians, fish, invertebrates, birds, and mammals. This biodiversity includes the Oregon spotted frog (*Rana pretiosa)* that is listed as threatened under the federal Endangered Species Act (ESA), the Olympic mudminnow (*Novumbra hubbsi*) that is endemic to Washington, and many Pacific salmon and steelhead species (ASRP 2019). Notably, the Chehalis is the only basin in Washington that does not have an ESA-listed endangered or threatened Pacific salmon population (ASRP 2019). Although the Chehalis Basin is relatively intact ecologically, it provides only a fraction of the wetland habitat that it once did prior to European and American colonization (Beechie et al. 2021).

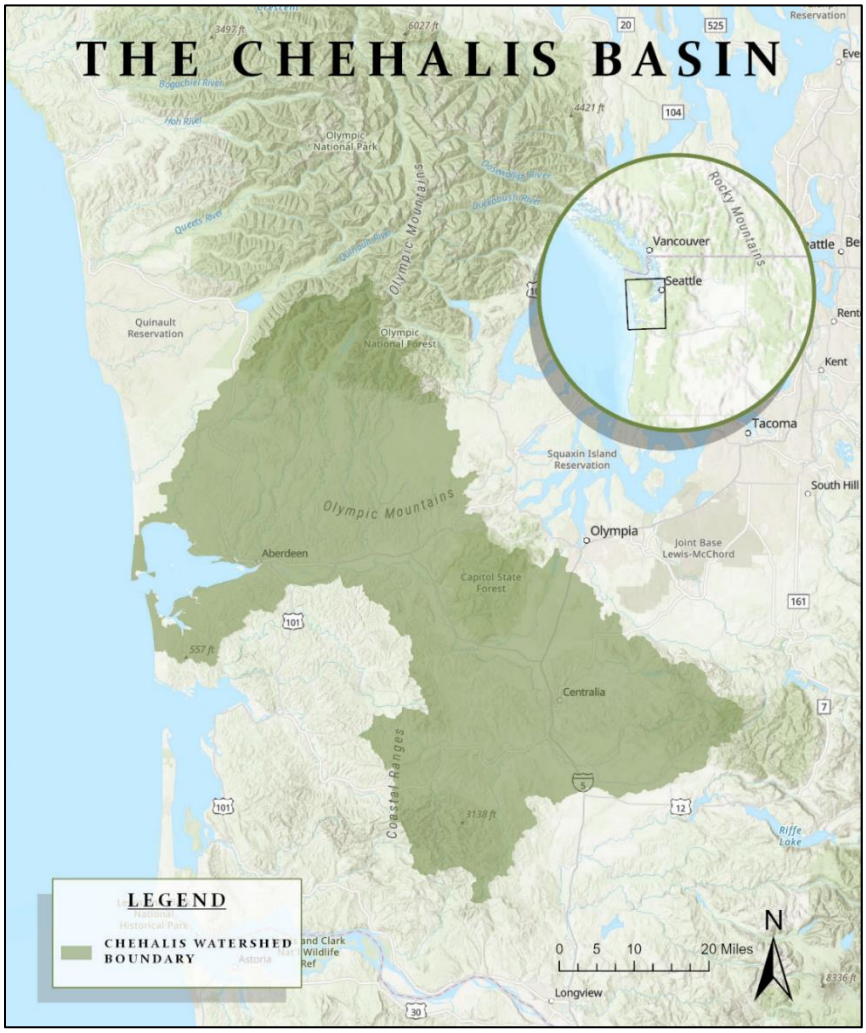

Figure 1 – The extent of the Chehalis Basin in Western Washington

Much of what we know about the Chehalis Basin's ecological past comes from maps (some dating back as far as the 1800s), historical survey notes, contemporary reference sites, and models. These resources have revealed that the Chehalis Basin has experienced a 90% decline of beaver ponds, marshes, and side channels (Beechie et al. 2021). A significant loss of in-stream large wood and standing vegetation has also been documented in the Basin compared to historical conditions (Beechie et al. 2021). This large wood and standing vegetation would have provided increased shading to riparian stream areas, reducing water temperatures in dry summer months, and increasing the quality of salmonid rearing habitat (Seixas et al. 2018; Beechie et al. 2021). Due to these various impacts, it is estimated that the Chehalis Basin has lost more than half of all historic salmonid run sizes to date (Hiss & Knudsen 1993; PFMC 2019). This is a key reason that restoration practitioners are eager to restore and maintain the historic ecoregions in the Chehalis Basin to benefit fish, wildlife, and people (ASRP 2019).

Historically, beaver have played a significant role in maintaining this wetland dominated landscape (Beechie et al. 2021). Because of the basin's proximity to many Hudson's Bay Company outposts,

we can infer that beaver were likely abundant pre-colonization. An abundance of beaver in the Chehalis Basin would have made the region richer in wetland habitat and slow flowing channels spread across the floodplain.

Our Study

Restoration projects, beaver habitat, and private lands are likely to increasingly overlap in the Chehalis Basin. To better understand beaver-human interactions in the Chehalis Basin today and gauge existing conflict, we conducted a survey of landowner perception of beaver, mapped occurrences of reported beaver conflict and evidence of beaver activity, and analyzed recreational trapping data.

Through facilitating a landowner perception survey, stakeholders can begin exploring beaver-related landowner concerns and possible management issues. One of the most important components for successful restoration is collaboration with and support from landowners and stakeholders (Druschke & Hychka 2015). Our survey is intended to bridge the gap between restoration practitioner and landowners in the Chehalis Basin surrounding positive and negative attitudes towards beaver. By assessing the needs, values, attitudes, and behaviors that landowners have in the Basin, our study can help better avoid conflict when pursuing beaver-related restoration.

In addition to our landowner survey, we map occurrences of beaver conflict and beaver trapping data which can be used to further refine ASRP decisions surrounding beaver and beaver-related restoration practices. Specifically, these data help inform where conflict is known to occur and where it is likely to continue occurring. Finally, in the absence of robust beaver population data, trapping trends underscore the likely growth of beaver population in the Chehalis Basin, particularly as restoration practices continue to blossom in the region. Although there are limited formal data from surveys of beaver populations, our compiled data on incidental beaver observations offers important baseline information on where beaver are known to occur.

Methods

Landowner Perception Survey

We assessed landowner perception of beaver through a survey (Appendix A) that relied on cognitive hierarchy theory (Fulton et al. 1996; Vaske & Donnelly 1999). Cognitive hierarchy assumes that values follow a specific chain of events that explain resulting behaviors (Figure 2). For example, Vaske and Donnelly (1999) examined public support for environmental preservation in Colorado state by looking at the connection between value orientation, attitude/norms, and behavioral intentions, finding that specific value orientations were associated with behavioral intentions. Specifically, if a survey respondent displayed a more biocentric value orientation, they were more likely to exhibit behavioral intentions of voting for increased environmental preservation. Accordingly, values that individuals hold for beaver in the Chehalis Basin may indicate how they react towards beaver and beaver restoration, as well as wildlife management more broadly (Figure 2)

Our survey was modeled on prior beaver perception surveys used in New York (Siemer et al. 2004), Massachusetts (Jonker et al. 2006), and Thurston County, Washington (Smillie 2019). Dr. Sandra Jonker (WDFW) provided permission for use of this modified survey. These prior beaver survey studies found support for the hypothesis: "People's tolerance for beaver will decrease and their attitudes towards beaver will become more negative as negative interactions with beaver increase." We predicted that this same hypothesis will be supported in the Chehalis Basin. There have been few peer reviewed beaver perception studies to date (Siemer et al. 2004, Jonker et al. 2006, Siemer et al. 2013). Components of these previous surveys incorporated into ours include:

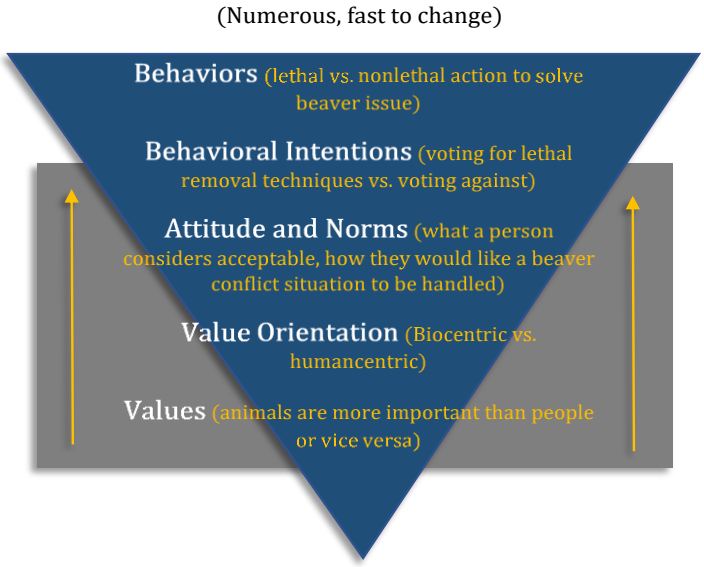

Figure 2 - The Cognitive Hierarchy Theory for Human Behavior
From the bottom, we have values – which are few and not easily changed – to the top – where we have behaviors which are far more prevalent in amount and change more readily. In yellow are beaver related examples of each step along this hierarchy. This triangle was adapted from Fulton et al. (1996) and Vaske and Donnelly (1999).

i. Attitudes Towards Wildlife Generally and Beaver Specifically

Attitudes may be an indicator of future actions. By not only asking for responses to attitude statements related to beaver, but also related to wildlife, our survey approach can investigate whether survey participants have attitudes and behaviors that are unique to beavers or are generalizable across wildlife broadly. Included in the survey are 11 beaver-related attitude statements and 19 broader wildlife-related attitude statements.

ii. Wildlife Acceptance Capacity

Wildlife acceptance capacity (WAC; not to be confused with Washington state's 'Washington Administrative Code' [WAC]) is described as the "maximum wildlife population level in an area that is acceptable to people," (Decker & Purdy 1988). WAC generally is in reference to a particular species or group of species rather than all wildlife in general. To assess beaver-specific WAC, our survey included the multiple-choice question, "Which number below best represents your preference for the future population of beavers in the Chehalis Basin?" The respondents' choices listed were no beaver, 50% less, current beaver, 50% more, and twice as many. This question helps inform which and how many individuals in the Basin have had their WAC exceeded.

iii. Socially Acceptable Beaver Mitigation Techniques (Norms)

In line with previous surveys (Siemer et al. 2004; Jonker et al. 2006; Smillie 2019), gauging which mitigation techniques are appropriate to use based on the severity of inflicted beaver damage can provide insight into how to initiate socially acceptable beaver management. An important aspect of our survey is capturing the relationship between the attitudes individuals hold towards beavers and wildlife and how these attitudes influence their normative beliefs. For instance, our survey can

capture individuals' levels of comfort with certain beaver damage mitigation techniques based on the severity of a particular kind of damage (e.g., beaver seen in yard versus flooded road caused by beaver).

The mechanism we used to measure this normative belief assessed connections between four beaver scenarios with three separate possible action statements. The four scenarios were "a beaver is seen in my yard," "a beaver floods a public road," "a beaver damages my private property (trees, well, etc.)," and "a beaver carries disease that is harmful to humans." The action statement the respondent chose based on the scenario included no action, control water levels, and lethal control (these action statements are in line with past surveys). Respondents ranked answers from "strongly agree" to "strongly disagree" depending on which action they thought was appropriate in response to each of the four scenarios.

Additional Aspects Explored in our Survey

To further assess how beaver conflict influences respondents' beliefs, we further stratified responses into two categories: those who answered "yes" to the question, "Have you ever experienced a problem at or around your home that resulted from beaver or beaver activity?" and those who answered "no". Although our beaver Conflict, Presence, and Scarce groupings (see below) helped stratify respondents initially, this additional stratification allowed us to classify respondents based on whether they actually report conflict with beaver and not whether we inferred conflict prior to the survey. By stratifying these two groups, we examined responses to the "Wildlife managers should…" statements as well as responses to the question, "In your opinion, what best describes the extent of beaver damage in your area over the last five years?" (Figure 4). Strongly (dis)agree were combined into one category "Agree" and "Disagree". By examining how yes/no groups answered survey questions, we can begin to analyze different opinions individuals hold based on experience with beaver conflict.

Survey Stratification and Implementation

To better assess the Chehalis Basin's general population's opinion of beaver, we first mailed survey materials to addresses in three pre-stratified demographic categories: beaver conflict areas (Conflict), beaver present areas (Present), and beaver scarce areas (Scarce). Although previous studies targeted specific geographic regions based on human population density, our survey targeted individuals based on inferred exposure to and experience with beaver based on several criteria (Table 1). This allowed us to assess landowner perception of beaver based on their experience with beaver, independent of population density. As such, the area a survey respondent lives in may be in suburban or agricultural landscapes, but this habitat could also lie within a city. Because of this, each of the survey groups (Conflict, Present, and Scarce) could include individuals from across

Group	**Buffer Distance**	**Points Buffered From**	**Mailed Surveys (n)**
Beaver Conflict (Conflict)	Within 30.48 meters of points	Only conflict points	344
Beaver Present (Present)	3.22 km from points	All observed beaver sign points	600
Beaver Scarce (Scarce)	8.05 km from points	All observed beaver sign points	600

Table 1 – Criteria used to identify groups surveyed for landowner perception of beaver.

the Basin in differing geographic locations, as suitable beaver habitat often does not discriminate based on land use composition.

The Conflict survey group represents individuals who have presumably had direct conflict with beaver and therefore offer input from individuals who were most impacted by beaver related damage in the Basin. For the Conflict group, we compiled 344 addresses within 30.48 m (100 ft) of known areas where negative human-beaver interaction occurred. We chose this buffer distance to ensure the conflict point was representative of an individual or household at a given location who had experienced conflict with beaver. Conflict points were established by assessing data from Special Trapping Permits (STP) and Hydraulic Project Approvals (HPAs). Special Trapping Permits are issued to applicants (including landowners and Wildlife Control Operators) who demonstrate an animal problem that cannot be mitigated or resolved by nonlethal means. These permits started requiring location data as of 2015. For this reason, STP data used for the purposes of this survey comes from 2015-2020 (n=369). HPA data were queried from WDFW instances of permits being granted for the notching or extraction of beaver dams to mitigate flooding damage. HPAs also permit pond leveler devices and beaver exclusion fencing (see Discussion for more details); however, we considered these actions as coexistence and did not include them in the Conflict group's points. HPA data available for this report encompasses HPAs granted from 2014-2020, with a total of 34 data points.

The Conflict group has the lowest number of potential survey respondents because of our relatively strict criterion that each individual has experienced and acted in a beaver conflict situation by obtaining a permit. Because of this, we mailed our survey to each address identified as intersecting with the 30.48 m buffer from these conflict points. We recognize that this represents only a subset of the community who has experienced beaver conflict as conflict may have gone unreported. For this reason, this Conflict group is somewhat different from respondents described above who selected "yes" or "no" to having experienced a beaver conflict interaction. This is because individuals we classified as the Conflict group responded to a beaver conflict situation by requesting certain permits, as opposed to experiencing it and not necessarily responding to it. This distinction may provide further detail on individual landowner differences when experiencing beaver conflict situations, including differences between those who choose to act and those who did not.

Addresses for the beaver Present group respondents were chosen using all data reporting sign of beaver presence. This includes STP and all HPA data (including coexistence points), as well as data gathered from incidental sign of beaver recorded during other unrelated, largely basin-wide surveys conducted by WDFW. These surveys include western toad (Tyson et al. 2021), stream-associated amphibian (Gygli et al. 2020), freshwater mussel (Douville et al. 2021), off-channel intensive (Hayes et al. 2019), off-channel extensive (Hayes et al. 2015; Holgerson et al. 2019), and egg mass surveys (Hayes et al. 2015). We used these surveys as an additional source for identification of potential beaver presence because of the consistency of information collected and study areas that were of focus. Although these specific survey data are not complete as they were incidental and not focused on beaver *per se*, they represent the most comprehensive data on beaver presence in the Basin to date. We identified all addresses within 3.2 km (2 mi) of each beaver presence point and randomly selected 600 from 2,346 to include in the beaver Present group. This buffer distance represents individuals who may not necessarily have had direct conflict with beaver but who live near beaver. Although this is the most ideal way to identify individuals in the Present

group, it is possible that individuals in this group never interact with beaver or experience beaver conflict that was not captured using our approach.

The final group of survey respondents, the Scarce group, were chosen in a similar way to the Present group, except the buffer distance from all beaver presence points was 8.05 km (5 mi) instead of 3.22 km (2 mi). This buffer distance represents individuals who we assume live further from beaver and who have likely had the least interaction with the species. 600 addresses of 10,243 were randomly sampled for this group and mailed survey instructions. All areas surveyed for beaver perception are shown in Figure 3.

We acknowledge that our pre-survey stratifications are based on inferences from available data and not necessarily from actual experience for beaver. For instance, individuals may be stratified as Conflict but may not personally have experienced beaver conflict. Similarly, individuals may live in beaver Present strata and have experienced unreported conflict or individuals may live in beaver Scarce strata but actually have beaver nearby that are undocumented. Despite these possible limitations, our three stratifications provide a tractable first step in understanding how exposure to beaver and beaver conflict shape individuals' attitudes towards beaver and beaver management.

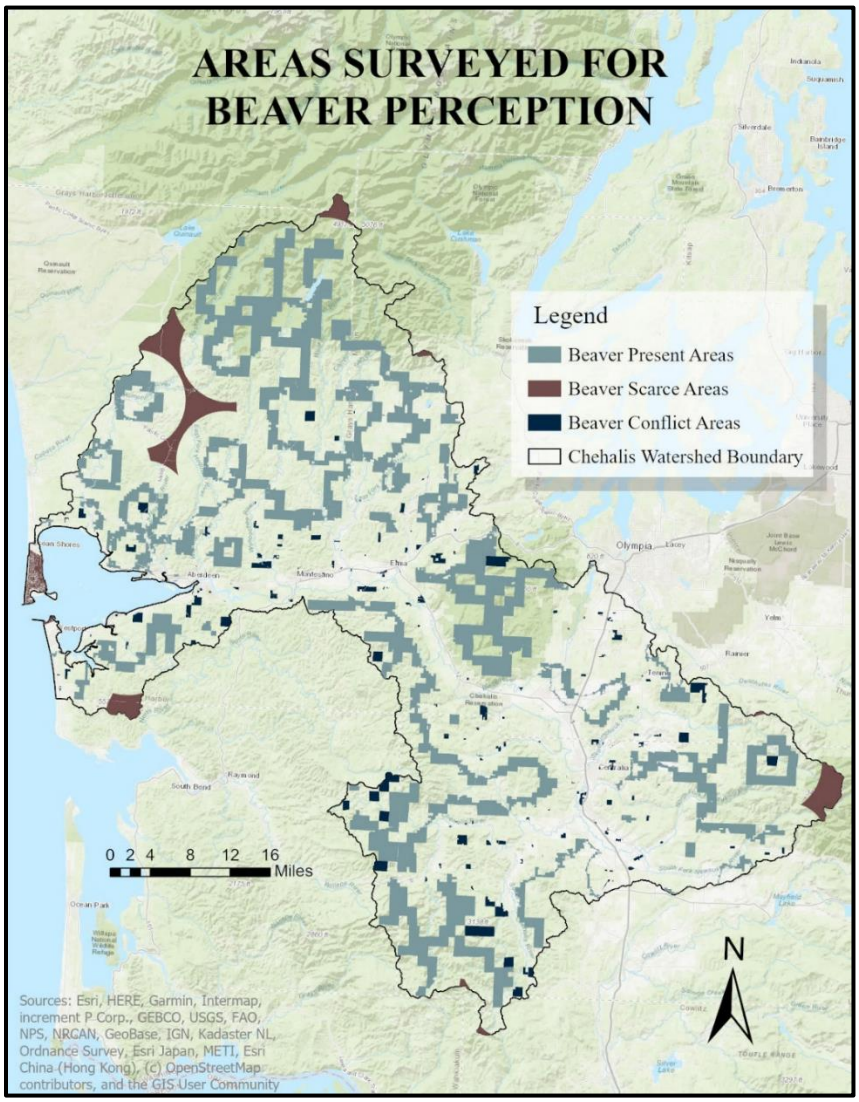

Figure 3 – Areas Surveyed for Beaver Perception. All areas in color represent the parcel addresses used for mailing survey slips, as well as the areas later targeted for Facebook ads with our survey link included. areas surveyed for beaver

Each identified address received a cover letter (Appendix B) stating the purpose of the survey and the importance of the information being gathered, as well as a QR code and link directing the respondent to our web-based survey. Directions were also included in the survey materials stating that the adult in the house with the closest birthday should take the survey to maximize randomization between age and gender demographics. We chose a web-based survey because web-surveys use less materials while also making it easier for respondents to submit their finished surveys.

Our web survey was designed using PublicInput.com. This platform allowed us to view respondents' data in real time, create three separate QR codes for each survey group to help organize data, and offered options for targeting specific geographic locations through Facebook ads in case Facebook was needed for supplemental responses to boost sample size.

Across all groups, we received 120 total responses through our mail survey slip and opted to use the Facebook ad function to generate additional responses. The ads targeted areas in each respondent group that had five or more identified addresses within a 1.6 km (1 mi) radius of each other. Grouping five or more addresses together that were selected for the Conflict, Present, and Scarce groups and targeting that area for Facebook ads allowed us to be sure these respondents were representative of each group. For instance, the Facebook respondents for the Conflict group were inferred to have experienced conflict because they were proximate to five reported points of conflict as described above. In total for all groups, we gathered 453 submitted surveys from these targeted Facebook ads for a total of 573 responses between mail and Facebook responses.

Our survey questions were largely identical to the prior beaver perception survey studies but differed with the inclusion of additional questions. Some of these additional questions aided in gathering contact information from respondents. One question asked, "Are you interested in habitat, and solutions to beaver conflict that don't require lethal removal? If you are interested, please provide your contact information." This contact information can be used in the future to guide beaver management and habitat restoration opportunities that may arise from working together with landowners in the basin. To further this pursuit in understanding how beaver restoration might be perceived, an additional question was added: "Should wildlife managers promote wildlife diversity by enhancing habitat for beavers?" Additionally, two questions were added that pertain directly to immediate responses survey takers have in regard to beaver-human conflict. These questions asked on a scale of strongly agree to strongly disagree, "Wildlife managers should relocate beavers to reduce human conflicts," and "Wildlife managers should lethally remove beaver to reduce human conflict." The final two aditional questions related to amphibians. These questions asked respondents to choose if they would strongly agree to strongly disagree with the statements, "I like having amphibians, such as frogs, near my home," and, "I enjoy hearing frogs calling near my home." These amphibian-focused questions allowed us to understand landowner perceptions of a taxon that benefits from beaver habitat (Romansic et al. 2020), which typically does not cause conflict with landowners, and which may be perceived as different from other wildlife that are game or game-adjacent species like many mammals, birds, and fishes. All survey questions can be found in Appendix A.

In the R statistical language, we used binomial generalized linear models (GLMs) to analyze our attitude statement data. In our analyses, we pooled Strongly (Dis)agree and (Dis)agree answers into a single Agree/ Disagree binary answer. We did not include neutral answers in our analyses. We used binomial GLMs to test for different Agree/Disagree response rates among beaver Conflict, Present, and Scarce demographics. We further employed Tukey's honestly significant difference (hsd) post-hoc tests (using the R package 'multcomp') to identify which landowner categories were different from each other in Agree/Disagree response rates for each question. Tukey's hsd assigns a statistical grouping to each level within a study group. In our case, this analysis statistically groups or separates beaver Conflict, Present, and Scarce landowners based on the proportional differences in their responses for each question. Questions for which there are no statistical differences among landowner types, Tukey's hsd test will assign all landowner types as the same statistical category (e.g., "a"). When there are statistical differences among landowner types, Tukey's hsd test will

assign a different statistical category (e.g., “a”, “b”, “c”) to each landowner type. In our analysis, these categories are ranked such that, for instance, category “a” would be the lowest proportion responding a certain way, “c” would be the highest proportion responding a certain way, and “b” would be statistically intermediate to the other two categories. In cases where a landowner category is statistically indistinguishable from two other statistical groupings, Tukey’s hsd assigns two statistical groupings (e.g., “a,b”) to signify this. For questions where we could not use a binary response, we used multinomial regression and Tukey’s posthoc tests using the R packages ‘nnet’ and ‘lsmeans’. We used an α of 0.05 to determine statistical significance for all analyses, but also highlight analyses at $\alpha = 0.10$ as marginally significant and worth discussing.

For the above questions where we used binomial GLMs and reduced responses to a binary answer of Agree/Disagree, we subsequently performed a multinomial analysis using the R packages ‘nnet’ and ‘lsmeans’. Our multinomial analyses allowed us to explore whether exploring the full array of answers (Strongly Disagree, Disagree, Neutral, Agree, or Strongly Agree) provided more nuanced inferences than removing Neutral answer and aggregating Strongly Disagree/Disagree and Strongly Agree/Agree into a binary answer.

Conflict, Observational Beaver Data, and Trapping Methods

Population estimates for beaver in the Washington state in general and the Chehalis Basin in particular are lacking. This is largely due to a lack of resources dedicated to systematically sampling beaver populations. Even so, some data relating to beaver or beaver sign have been collected over the years. For the most part, these are incidental or observational data that were captured during other unrelated surveys by WDFW staff. Beaver data also available internally within WDFW includes the number of beavers recreationally trapped each year, STP and HPA permits, instances of beaver activity near culverts via WDFW’s Fish Program, as well as non-internal data received from the U.S. Fish and Wildlife Service (USFWS), Beavers Northwest through iNaturalist, Grays Harbor Conservation District, Mason County Public Works, Chehalis Basin’s Fishery Task Force, and Thurston County Public Works. Using these data, we asked: (1) Which areas are of beaver-related restoration interest while simultaneously offering the lowest conflict potential? (2) What is the known extent of beaver observations? and (3) What are the current trends in recreational beaver trapping?

To identify areas having high beaver-related restoration potential but relatively low conflict potential, we overlaid the STP and HPA conflict data with areas ranked highly for habitat protection and restoration as outlined by the ASRP (ASRP 2019). Three restoration implementation periods (near-term, mid-term, and long-term) have been identified by the ASRP, highlighting areas in the basin for potential restoration based on three 10-year spans. These three periods consider a multitude of science-based scenarios and evidence, some of which include the population trends for salmonids, other fisheries, and amphibian species, as well as taking into consideration impacts of invasive species, restoration conflicts that may arise between different organisms within ecosystems, and spring-run/fall-run Chinook salmon hybridization (ASRP 2019). Through examining the near-term, mid-term, and long-term implementation periods, key locations have been selected for beaver and beaver dam analog (BDA) assisted restoration. By combining areas prioritized for beaver restoration in all implementation periods with beaver conflict data (STP & HPA), we can identify areas where direct beaver restoration may result in greater or less landowner conflict. As human and beaver populations increase, conflict areas will likely continue to

change on the landscape. Because of this, the near-term period was used to depict the current state of beaver-human conflict in the Basin with the intent of guiding restoration in the near-term. A future conflict area assessment would be advised before going forward with the mid-term and long-term implementation periods in relation to beaver facilitated restoration. We placed a 1.6 km (1 mi) buffer around each conflict point residing inside or within 1.6km (1 mi) of areas selected for near-term beaver related restoration to further highlight and visually distinguish the area where this conflict has occurred.

Although there is a considerable amount of beaver-related observational data that have been collected for this document, these data have many inconsistencies and limited spatial coverage. This was the expected outcome, as organizations and individuals providing these data varied greatly in the intent of their surveys. For example, some data were recorded with less consistency, skipping years, and completing surveys at different times each year. Some data sets reported instances of beaver sign, such as chew sticks or dams whereas others reported observations of an individual beaver. These limitations and a lack of targeted beavery surveys preclude a robust population estimate. However, by assessing the combined data collected to-date, we can present a preliminary understanding of areas in the Chehalis Basin where higher amounts of beaver activity have been observed. We collated disparate data (n=1,374) from various organization, we produced maps that can be useful for informing restoration practitioners and other stakeholders about beaver occurrence and where conflict situations are most likely to happen in the future (based on areas already dense with beaver observations). Focused surveys for beaver activity will be critical in further refining the ASRP's goals and for the utility of this resource for practitioners.

Finally, the Pacific Northwest generally and the Chehalis Basin specifically have had a complex history of beaver trapping. Contrary to the multiple centuries of intensive settle-colonial trapping, contemporary regulated trapping allows for beaver harvest to continue at relatively sustainable levels, although beaver pelts do not demand the high prices that they once did. To explore recent trends in recreational beaver trapping, we plotted trapping data from 1984-2020. These data are intended to help visualize the popularity of beaver trapping over time as a proxy for inferring whether beaver populations are likely to continue growing in the Basin. We used Poisson GLMs and likelihood ratio tests to analyze these trend data, testing for additive and interactive effects between trapping year and county identity.

Results

Landowner Survey

We received a relatively small response rate (n = 120; 7.77% response rate) from our mailed survey but received more responses (n = 453) from targeted Facebook ads. Unfortunately due to the nature of Facebook ads, total response rate could not be calculated due to the unkown number of respondents who clicked on the ad without completing the survey. Specific group response rates also varied by question, as respondents were not required to answer every question included in the survey. Therefore, each groups' individual response rates are noted independently depending on the question or statement in each analysis section below.

i. Attitude Statements Towards Beaver and Wildlife

In general, Conflict individuals exhibited more negative beaver attitude responses than the beaver Present and Scarce groups (Table 2). For example, in the statement, "No beaver should be killed in the area where I live," responses varied greatly among groups. In the Conflict group (n=206), 19%

of respondents agreed with this statement while 59% and 83% of the Present (n=127) and Scarce groups' (n=65) respondents agreed, respectively. For this question, when 'Agree' and 'Disagree' were analyzed for this question, all pairwise comparisons among Conflict, Present, and Scarce groups were significant ($p < 0.05$), suggesting a gradient of increasing agreement for lethal action from Conflict to Present to Scarce. For all other questions, statistical differences among the Conflict, Present, and Scarce groups were either a gradient of agreement or a binary, typically with the Present group exhibiting similar responses to the Scarce group.

The wildlife attitude statements offer richer context on landowner perceptions towards wildlife beyond beaver (Apendix D). For many statements, all three groups answered similarly. For example, the statement, "Having wildlife around my home is important to me"," revealed statistically indistinguishable Agreement response rates from the Conflict group (84%, n=154), Present group (88%, n=93) , and Scarce group (89%, n=51). In comparison, some wildlife specific statements seemed to parallel the pattern seen for the beaver-specific statement responses. The wildlife attitude statement, "Although wildlife may have certain rights, human needs are more important than the rights of wildlife," had a similar outcome to beaver attitude statements. The more beaver interactions an individual was likely to experience (i.e., more for Conflict, intermediate for Present, and low beaver interaction for Scarce), the more negative their responses would be towards wildlife. For this question, 64% (n=182) of the Conflict group chose Agree, a statistically higher rate of agreement than the 33% (n=107) of the Present group and 21% (n=57) of the Scarce group which are statistically equal (Appendix D).

Beavers are common in the area where I live	BC	BP	BS
Agree	82%	61%	52%
Disagree	7%	18%	29%

Beaver populations should be controlled in the area where I live.	BC	BP	BS
Agree	69%	21%	15%
Disagree	16%	43%	57%

Beavers have a right to exist in the area where I live.	BC	BP	BS
Agree	58%	78%	85%
Disagree	18%	7%	3%

Residents should learn to live with beavers in the area where I live.	BC	BP	BS
Agree	30%	63%	70%
Disagree	48%	12%	3%

There are too many beavers in the area where I live.	BC	BP	BS
Agree	46%	18%	3%
Disagree	29%	60%	67%

No beavers should be killed in the area where I live.	BC	BP	BS
Agree	19%	59%	83%
Disagree	68%	24%	11%

Beavers are a sign of a healthy environment in the area where I live.	BC	BP	BS
Agree	55%	80%	74%
Disagree	18%	5%	3%

The presence of beavers make it a burden to have a wetland near your home in the area where you live.	BC	BP	BS
Agree	51%	21%	5%
Disagree	24%	47%	57%

Beavers are a nuisance in the area where I live.	BC	BP	BS
Agree	53%	17%	6%
Disagree	29%	63%	69%

People don't want a wetland near their home because it could become a haven for beavers in the area where I live.	BC	BP	BS
Agree	38%	13%	6%
Disagree	27%	40%	47%

Beaver populations should be left alone in the area where I live.	BC	BP	BS
Agree	21%	55%	68%
Disagree	60%	19%	5%

Agreement

Low — High

Table 2 – Beaver Attitude Statement Results. Shared shading color reflects statistical groupings. Darker to lighter gray shading representing statistically lower to higher percentages agreeing with a given question. Groups with the same shading had statistically indistinguishable differences. Shading is only comparable within a given question's responses.

ii. Wildlife Acceptance Capacity

To determine survey respondents' beaver-specific wildlife acceptance capacity (beaver WAC), and if beaver WAC is currently being strained, we analyzed responses to the question "Which number below best represents your preference for the future population of beavers in the Chehalis Basin?". Respondents had five options to choose from (Table 3). When considering this question, it is worth noting that respondents do not currently have quantitative data to address this question. Even so, our analysis revealed predictable patterns of desired beaver prevalence among the three respondent groups. Responses occurred along a continuum with the Conflict group generally desiring unchanged or reduced beaver levels in the Basin, the Scarce group wanting unchanged levels of beaver, and the Present group falling between these two groups but trending more towards the Scarce group (Table 3).

Response	Conflict Group (n= 198)	Present Group (n=119)	Scarce Group (n=63)	Conflict vs. Present	Conflict vs. Scarce	Present vs. Scarce
Twice as Many Beaver	2%	15%	21%	**p=0.0064**	**p=0.0097**	p=0.6455
50% More Beaver	9%	11%	6%	p=0.8624	p=0.7439	p=0.5384
Same Amount of Beaver	41%	60%	70%	**p=0.0164**	**p=0.0028**	p=0.3767
50% Less Beaver	43%	12%	3%	**p=0.0001**	**p=<0.0001**	*p=0.0659*
No Beaver	5%	2%	0%	p=0.2358	**p=0.0179**	p=0.3594

Table 3 – Beaver-Specific Wildlife Acceptance Capacity. Respondents' answers to the question, "Which number below best represents your preference for the future population of beavers in the Chehalis Basin?" This question and subsequent answers were used to interpret the beaver-specific Wildlife Acceptance Capacity of respondents. Statistical differences in responses among groups are shown with bolded p-values ($p < 0.05$) and marginally significant ($0.1 < p < 0.05$) differences are italicized.

iii. Socially Accepted Mitigation Methods Based on Scenario

For all four scenarios presented (Appendix E), the Conflict group had the greatest support for lethal removal of beaver. Specifically, lethal action was agreed upon by 47% of the Conflict group (n=186) for the scenario "a beaver is seen in my yard." In comparison, 13% of the Present group (n=111) and 5% of the Scarce group (n=58) agreed with lethal action for this scenario. The Conflict group more often selected lethal action for each scenario than both the Present and Scarce groups. For all scenarios and scenario responses, "neutral" responses rarely statistically-differed among Conflict, Present, and Scarce groups and so offer minimal insight into how neutral attidues vary among these demographics (Appendix E).

Additional Results from Survey

When analyzing the question, "What types of beaver-related property damage have you personally experienced?", damage to individual trees or wood lots was the most frequently selected response (132 of 172 responses), with the next highest category, plugged culvert pipes, selected 82 times (Figure 4). Because of the limited number of participants who responded to this question, we combined combined the Conflict, Present, and Scarce groups as we did not have the power to confidently distinguish differences among the groups. Respondents had the option to choose multiple types of property damage.

With respect to questions surrounding what "Wildlife managers should…" do in difference among respondents who answered "yes" or "nor" to the question: "Have you ever experienced a problem at or around your home that resulted from beaver or beaver activity?". The choice respondents made in terms of agreeing and disagreeing if wildlife managers should lethally remove beaver vs. relocate

them was of particular importance. Respondents agreed at similar rates (~ 30-40%) with respect to beaver relocation, regardless of whether they have experienced beaver conflict. In contrast, those who had not experienced beaver conflict strongly disagreed with lethally removing beaver whereas those who had experienced conflict strongly agreed with lethal removal. Despite not differing in responses about beaver relocation, we found that individuals who reported experiencing beaver conflict were statisticaly more likely to support lethal removal than those who did not report experiencing conflict (Figure 5).

To assess how individuals differencing in their experiences with beaver conflict perceived changes in beaver damage, we asked "In your opinion, what best describes the extent of beaver damage in your area over the last five years?" Our analysis showed that those who had not experienced beaver conflict largely felt that beaver damage has remained the same. In contrast, a significantly larger fraction of respondents who had experienced conflict felt that beaver damage was increasing (Figure 6).

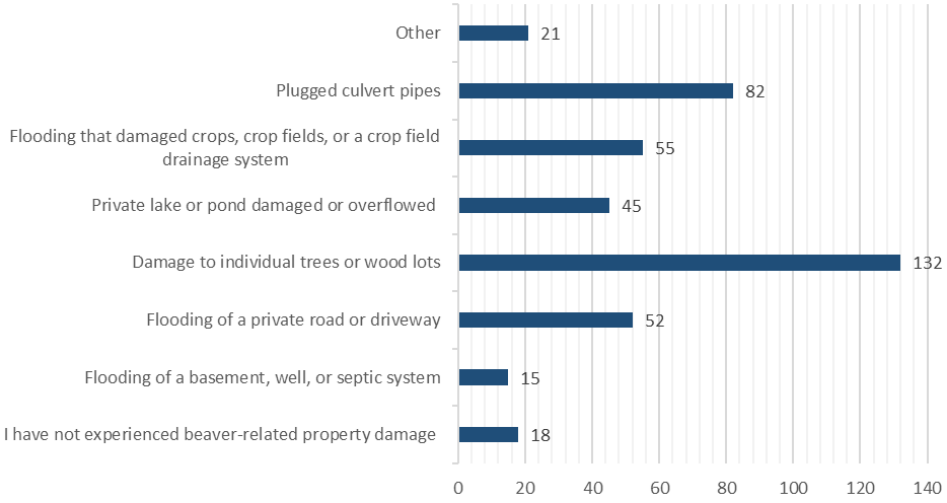

Figure 4 – The Most Commonly Experienced Beaver Issues. Answers to the question: "What types of beaver-related property damage have you personally experienced?". Respondents were able to select one or multiple options. 172 participants responded to this question.

Conflict, Observational Beaver Data, and Trapping Results

To better inform restoration and outreach efforts in the Chehalis Basin, we overlaid known beaver conflict locations with near-tierm restoration areas outlined by the ASRP (Figure 7). Our map highlights how many conflict areas overlap with near-term restoration areas. Importantly, the only reported near-term restoration area that does not currently have conflict are the Middle Wynoochee Tributaries (Figure 7, upper left corner).

We also compiled all known Chehalis Basin beaver activity data from diverse sources (Figure 8). Importantly, these data represent largely incidentally occurrence/sign observations only and cannot accurately inform beaver density or beaver absences as the Basin was not systematically surveyed for beaver. Available data highlight many beaver observations on or near the mainstem Chehalis River. A systematic beaver survey repeated over time would greatly benefit the ASRP and other practitioners by more rigorously uncovering the areas of greatest beaver activity, particularly if these areas shift over time as restoration proceeds and beaver populations expand.

Recreational trapping data illustrates a systematic decline across all four counties that encompass the Chehalis Basin (Figure 9; $p < 0.0001$)). We detected a significant statistical interaction between trap year and county ($p < 0.0001$), suggesting that the counties with higher overall beaver harvest in the 1980's (Lewis and Grays Harbor counties) had steeper declines in beaver trapping than counties with lower harvest earlier Interestingly, the year 2000 reflects an inflection point where trapping rates dramatically declines. One explanation for this decrease comes from a Washington state law that passed in November 2000 making it unlawful to use steel-jawed leghold traps, neck snares, or other body-gripping trap to capture mammals for fur recreation or commerce (RCW 77.15.194-198). These methods were the primary methods for beaver trapping, as alternative traps used today are more expensive and difficult to transport. This has likely made beaver pelts more difficult to harvest and less economically advantageous to pursue.

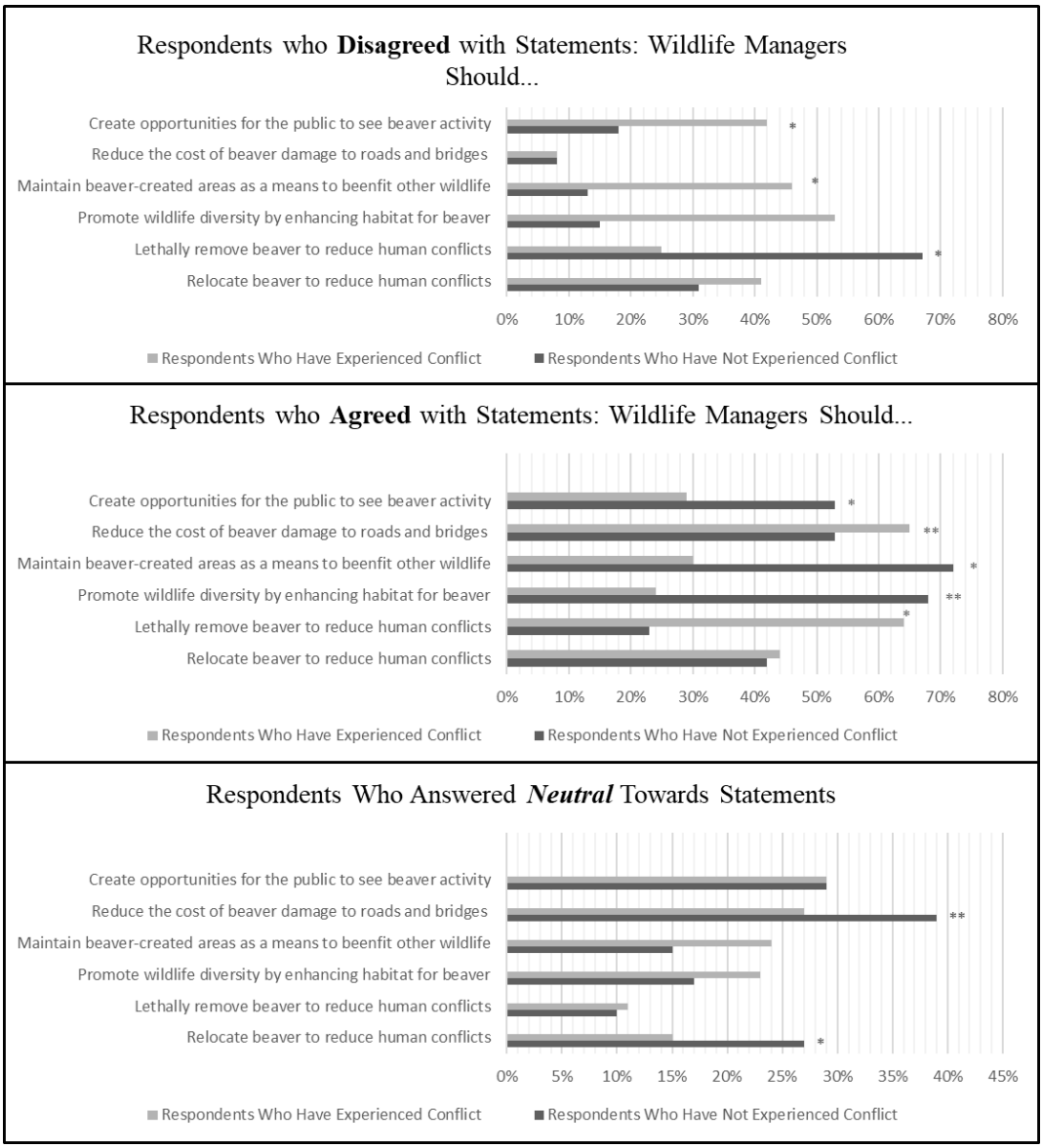

Figure 5 - Responses about what Wildlife Managers Should do stratified by whether respondents report experiencing beaver conflict. Significant differences between respondents experiencing conflict or not are denoted by: * = $p < 0.05$, ** $0.05 < p < 0.1$.

Discussion

We show that beaver is a common species and one that is likely to increase in the Chehalis Basin, that the degree to which landowners experience conflict with beavers shapes their attitudes towards beaver, and that there are approaches to mitigate conflict while capitalizing on the social and ecological benefits of beaver. Our landowner perception survey largely found that landowners in the Chehalis Basin experiencing negative interactions with beaver will tend to harbor more negative attitudes towards beaver. This is in line with other similar surveys on landowner perception of beaver elsewhere (Jonker et al. 2006; Siemer et al. 2013). Although this conclusion may seem intuitive, place-based evidence of the influence beaver have on landowner attitudes is essential for planning and prioritizing management decisions in the region.

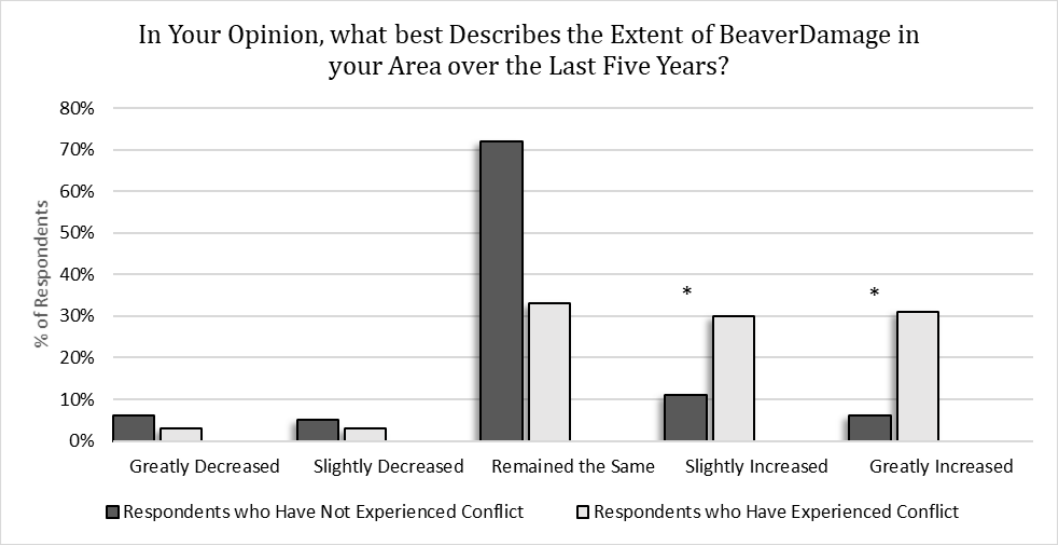

Figure 6 – Perceived changes in beaver damage as a function of respondents reporting experiencing conflict. Summary of individual answers to the question, "In your opinion. What best describes the extent of beaver damage in your area over the last five years?" Significant differences between respondents reporting experiencing beaver conflict are denoted by *.

Our survey differed from prior research by stratifying respondents ahead of time by whether they occurred in areas with known beaver conflict (Conflict group), where beavers were present but no conflict had been reported (Present group), and where beavers were rare (Scarce group) based on existing data in the Basin for where beaver sign and beaver conflict had been reported. This pre-survey stratification was markedly informative as these survey groups consistently differed in responses across questions. Specifically, we generally found that negative attitudes towards beaver were largely associated with these groupings such that respondents in conflict areas exhibited the most negative attitudes towards beaver and those in beaver scarce areas exhibited the least negative attitudes. Interestingly, respondents where beaver were present but conflict has not been reported exhibited intermediate negative attitudes, although these landowners tended to respond more similarly to the beaver scarce group than the beaver conflict group. Without discounting the value for understanding any particular landowner's values and perceptions – and the Chehalis Basin community's attitude changes over time – our results underscore how our approach provides a relatively rapid and robust way for managers to better target beaver and beaver-associated

management that accounts for human attitudes by leveraging existing data on beaver and beaver conflict.

Our analysis reflects landowner perception at a specific point in time. Beaver management in the Chehalis Basin would benefit from periodically updating this survey to better inform restoration and other management efforts in the future. Doing so would also inform whether outreach and education efforts in the Basin help alleviate conflict and shift attitudes. Our study is also limited in how we engaged potential respondents. Although we largely randomly sampled respondents (apart from the Conflict group), our mailed survey instructions returned a limited set of responses. Additionally, individuals who did not have access to the internet or a Facebook account did not see the ads we used to target their areas.

Respondents likely also did not encompass all demographics that comprise the Basin. Although only a subset of respondents provided demographic information, these responses suggest our respondents were largely older, white, male, married homeowners (Appendix F). Further, although our digital survey provided geographic coordinates for where survey responses were submitted, these do not necessarily reflect the residence of the respondent. Most of the responses we received had coordinates outside of the Basin which could reflect respondents using a virtual private network (VPN), who were traveling while responding to the survey, or who own property in the Basin but reside outside of it. This lack of geographic information for respondents limits our ability to test how aspects of geography (e.g., land use, Chehalis subregions) are associated with beaver perceptions. Future surveys, including a question asking if a respondent resides full-time at their home in the Basin and other resident status questions may be useful to the ASRP.

Further, our survey targeted private landowners which discount other groups which may own substantial land in the Basin or who play a critical role in managing the Chehalis Basin but who may own little or no land. For instance, timber companies own and manage a substantial portion of land in the Chehalis Basin, but the attitudes of these companies were not explicitly evaluated in our survey. Additionally, Indigenous perspectives on beaver in the Chehalis Basin were not sufficiently captured using our approach. Our survey asked whether an individual was Native American but did not ask about specific tribal affiliation. Further, individual's attitudes may differ from the broader perspectives of the Quinault Indian Nation (QIN) or Confederated Tribes of the Chehalis Reservation, and other tribes.

Notably, the QIN and the Chehalis Tribe play a pivotal role in co-managing the Chehalis Basin, contribute key expertise to the ASRP, and offer essential perspectives on beaver. For instance, the QIN is interested and supportive of restoring beaver into the Chehalis Basin, including possibly through introducing more beaver (D. Bingaman on behalf of the QIN, *pers. comm.*). Although the QIN recognizes that human-beaver conflict occurs - and experiences this conflict themselves – the QIN also values the ecological benefits beaver provide and view beaver as an essential component of restoring aquatic habitats and species, including salmon, into the Chehalis Basin. Further, the QIN identifies and foresees beaver as a means of flood control which is urgently needed in the Basin given historical and current land use patterns.

Despite the limitations of our survey, by surveying landowner perceptions of beaver and wildlife more generally, we have generated a clearer view of the complex dimensions surrounding human and beaver coexistence in the Chehalis Basin. Through conducting a landowner perception survey, viewing conflict areas overlayed with restoration areas, mapping observed beaver activity, and

assessing recreational trapping trends, our findings can help restoration practitioners refine their current management decisions.

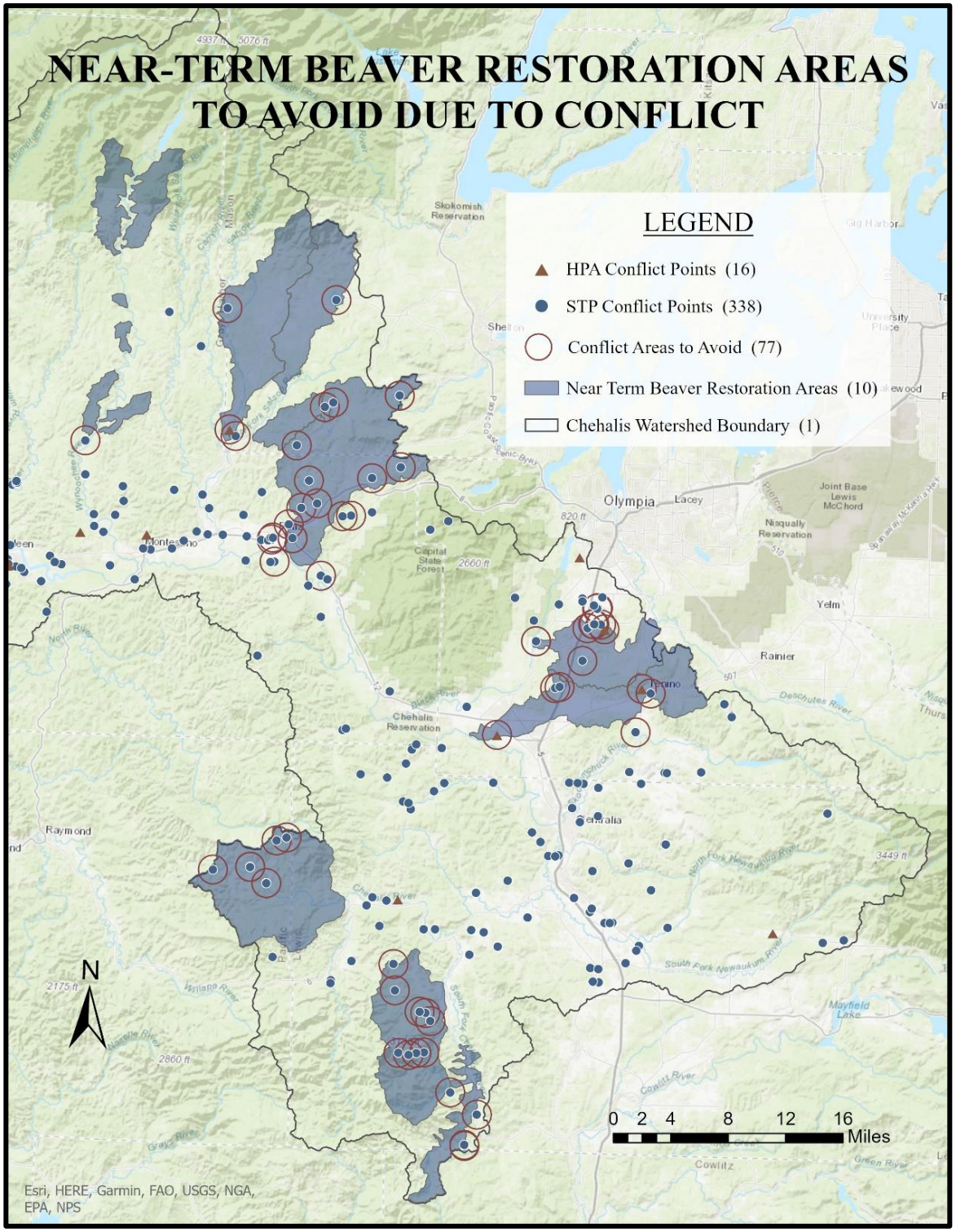

Figure 7 – Near Term Beaver-Associated Restoration Areas to Avoid. This map illustrates areas identified for beaver dam analog assisted restoration under the ASRP in the near-term implementation period. Also shown are HPA and STP identified points of beaver-human conflict that have occurred between 2014-220.

Avoiding Conflict

A central result from our work is underscoring the need to mediate or avoid human-beaver conflict to best meet the ASRP's restoration goals. ASRP, restoration practitioners, and policy makers recognize that restoring beaver and beaver-associated habitats in the Chehalis is essential for maintaining healthy populations of salmonids and other aquatic species. Further, the ASRP is actively implementing an ambitious array of aquatic restoration actions. Although this extensive restoration of wetland specific habitat in the Chehalis is relatively nascent, presumably these actions will contribute to increased beaver populations in the coming years. The substantial decrease in recreational trapping we assessed is likely to further increase beaver populations in the Chehalis Basin as restoration continues. Our results suggest that restoration in the Chehalis Basin may have a 'double-edged sword' effect by enhancing beaver habitat, beaver populations, and the wealth of ecological benefits that come from beaver while potentially increasing human-beaver conflict. The possibility of increased conflict emphasizes the need for preemptive conflict mitigation in the Chehalis Basin.

Our survey indicates that an increase in negative human-beaver interactions could degrade opinions towards habitat restoration that relies on or which increases beaver activity. Given the scale of ongoing and future ASRP restoration activities and the stark attitudes reflected in our survey, a top priority for ASRP and other restoration practitioners should be to proactively develop a plan to mediate or avoid beaver conflict in Chehalis Basin communities. Multiple tools exist for mediating or avoiding beaver conflict with communities. Top among these are education and community engagement. Other, relatively simple tools like culvert cages and tree wrapping as well as more complex tools like pond levelers or beaver dam analogs may also be effective in mediating conflict. Finally, beaver removal and relocation are less desirable options to deal with conflict and should be considered as a last resort.

Education and Community Engagement

The most important tool in mediating conflict in the Chehalis Basin will be education and community engagement on conflict mitigation tactics. Specifically, a first step would be to target education to (1) specific communities that live in areas with higher amount of documented beaver activity based on beaver sign (to preemptively prepare for conflict), (2) those impacted specifically by tree/vegetation removal (i.e., the most common conflict issue reported in our survey), and (3) landowners currently reporting conflict and who have exceeded their beaver-specific wildlife acceptance capacity. Targeted educational materials and community engagement activities should include details about the use and efficacy of approaches like culvert cages and tree wrapping to minimize beaver conflict. It should also involve nuanced discussions about the role that intensive technologies like pond levelers and beaver dam analogs play in managing beaver conflict while promoting more intact aquatic environments. An immediate need for the ASRP is to collate and share information for the Chehalis Basin to help practitioners and landowners identify professionals with expertise in employing beaver mitigation practices. For instance, a regularly updated website with relevant practitioners in the region and value of beaver would be a useful resource. Additionally, allocating funds to organize a beaver-human conflict mitigation taskforce should be considered, considering the lack of this resource currently available in the Basin.

Tree Protection, Culvert Cages, and Pond Levelers

Our survey explicitly points to the need for education focused on mitigation tactics for tree removal by beaver as this was the primary source of conflict reported by Chehalis Basin respondents. Education and management of this issue is especially important because this type of beaver damage

can become dangerous, as trees can fall on top of garages or homes. To avoid this outcome, landowners can wrap trees – either existing or newly-planted trees – with metal mesh such as chicken wire, which beaver are unable to chew through. This method is a simple and affordable method that is commonly used for mediating beaver damage to trees. Removing beaver is unlikely to be a permanent solution for mitigating damage to trees as other beavers are likely to populate the habitat; wrapping trees (and maintaining wrapping over time) is currently one of the best solutions to ensure continued protection.

Some wildlife conflict specialists have also reportedly found success with textural repellent. This repellent is composed of a sand and paint mixture that can be used to paint trees targeted by beaver. Because of the strange taste and texture this creates, beaver have been reportedly dissuaded from chewing these painted trees (Miistakis Institute & Cows and Fish. 2020). By preemptively installing mitigation tools like tree protection in known beaver dense areas, landowners can avoid conflict while simultaneously promoting habitat resiliency by means of coexisting with this keystone species.

Culvert cages and other forms of fencing are another conflict mitigation tool and are particularly important given plugged culverts were the second-most common form of beaver conflict reported in our survey. This tool uses a cage to keep beaver from plugging the path of water that flows through a culvert (Taylor and Singleton 2013). Culvert plugging has been a major issue for many public and private entities, as culverts are often installed to dissipate water to avoid flooding infrastructure. When beaver plug culverts, water flow becomes trapped and often results in more severe flooding. Most commonly, plugged culverts flood roadways which creates substantial hazards. Culvert cages can also be used to increase the effectiveness of other conflict-mediation tools like pond levelers. Importantly, culvert cages often require some degree of maintenance to ensure continued success (Taylor and Singleton 2013).

Another device, the pond leveler works by installing a large (> 2m [6 ft] in length) culvert directly through the main body of a beaver dam or beaver plugged structure, allowing water to continuously flow through. Pond levelers are flow control devices that often require some degree of post-implementation maintenance, but which have a relatively high success rate at mitigating conflict and are more affordable than other forms of conflict mitigation (Simon 2006, Boyles and Savitzky 2008, Hood et al. 2018). This device actively keeps water levels stable, unable to reach full flooding potential. Traditionally, a cylindrical cage (like a culvert cage) is installed on the upstream end of the tube to keep beavers from plugging it. These devices may be best used on problematic dams located in wider, open waterways or ponds. This type of flow device may not be as successful when installed through a dam in a highly channelized area, as beavers may begin building a dam directly upstream or downstream from the dam that employs the pond leveler. Although research on the efficacy of pond levelers is still needed in western Washington, research shows that pond levelers provide substantial financial benefits when used to mitigate beaver flooding (Simon 2006, Boyles and Savitzky 2008, Hood et al. 2018).

Beaver Dam Analogs

Beaver Dam Analogs (BDA) are an increasingly discussed, process-based restoration tool that employ artificial structures designed to mimic aspects of beaver dam form and function. BDAs often seek to recruit beavers to the area where the structures are installed, although attracting beavers is not always a goal. BDAs are constructed by driving untreated wooden posts into channel substrate and weaving riparian vegetation between the posts. They are typically implemented on small and

medium-sized streams in a low-tech process-based framework (Shahverdian et al. 2019). The ASRP identifies BDA implementation as an important restoration tool for forming and enhancing slow water habitats and promoting beaver colonization. BDAs have demonstrated punitive benefits to stream temperature (Weber et al. 2017), fish productivity (Bouwes et al. 2016), and stream flow, however most of these studies have been conducted in arid rangeland environments and so may not translate to the moister environments in the Chehalis Basin. Recognizing the lack of monitoring data for Western Washington, the ASRP included funding for Project Effectiveness to study BDAs in the Chehalis Basin (ASRP 2021).

A web-based BDA site selection tool[1] developed with ASRP funding utilizes the Beaver Intrinsic Potential model (Dittbrenner et al. 2018) and a complementary suite of aquatic resource and infrastructure risk screening tools. Because BDAs result in increased inundation in an area and may recruit beaver, it is essential to work with landowners to identify suitable project locations that minimize conflict.

Removal and Relocation

Relocating beaver is another option both for restoring aquatic habitats and mitigating human-beaver conflict if coexistence is challenging but requires special considerations and permitting[2]. To-date several *ad hoc* beaver relocations have occurred in the Chehalis Basin, but these have remained rare (K. Douville, *pers. obs.*). However, beaver relocation is not part of the ASRP strategy currently. Even so, there may be some interest in relocating beaver within and into Basin. For instance, the Quinault Indian Nation is a key stakeholder in managing the Basin and is supportive of relocating problem beaver within the Basin and even in introducing additional beaver to produce the substantial aquatic habitat beneifts beaver provide (D. Bingaman on behalf of the Quinault Nation, *pers. comm*).

In conflict situations, rather than lethally removing a beaver that is in conflict with people, beaver can be live-trapped and relocated to provide their habitat enhancement benefits elsewhere. Although relocation is often preferable to lethal removal, relocating beaver requires subsantial effort and should be a tertiary option compared to other conflict mitigation techniques. Further, removal and relocation is not ideal for conflict mitigation because other beaver are likely to recolonize a site and relocated beaver are unlikely to remain where they are relocated. One limitation to future relocation discussions would be the need for beaver husbandry facilities to house beavers between removal and translocation. Given the substantial restoration efforts underway in the Chehalis Basin, likely growing beaver population, and ongoing human-beaver conflict, there is a need to better consider the complexities of beaver relocations under the ASRP.

Beaver Research and Monitoring Needs

Many of the tools like culvert cages and pond levelers that are regularly employed and touted by practitioners are also poorly studied for their efficacy in maintaining ecological integrity, mitigating beaver conflict, and gaining interest within communities (Taylor and Singleton 2013, Hood et al. 2018). With respect to ecological integrity, there has been concern that some conflict mitigation approaches may interfere with salmon migration, although some limited evidence suggests this may not be an issue (Machus and Wilson 2018). Although education to communities about various beaver mitigation tools is paramount, the Chehalis Basin would benefit from targeted research that

[1] https://geodataservices.wdfw.wa.gov/hp/chehalis-beaver-dam-analog/
[2]https://wdfw.wa.gov/species-habitats/living/nuisance-wildlife/beaver-relocation#FAQ

evaluates the efficacy of different mitigation tools and the consequences these tools may have for habitat, fish, wildlife, and infrastructure.

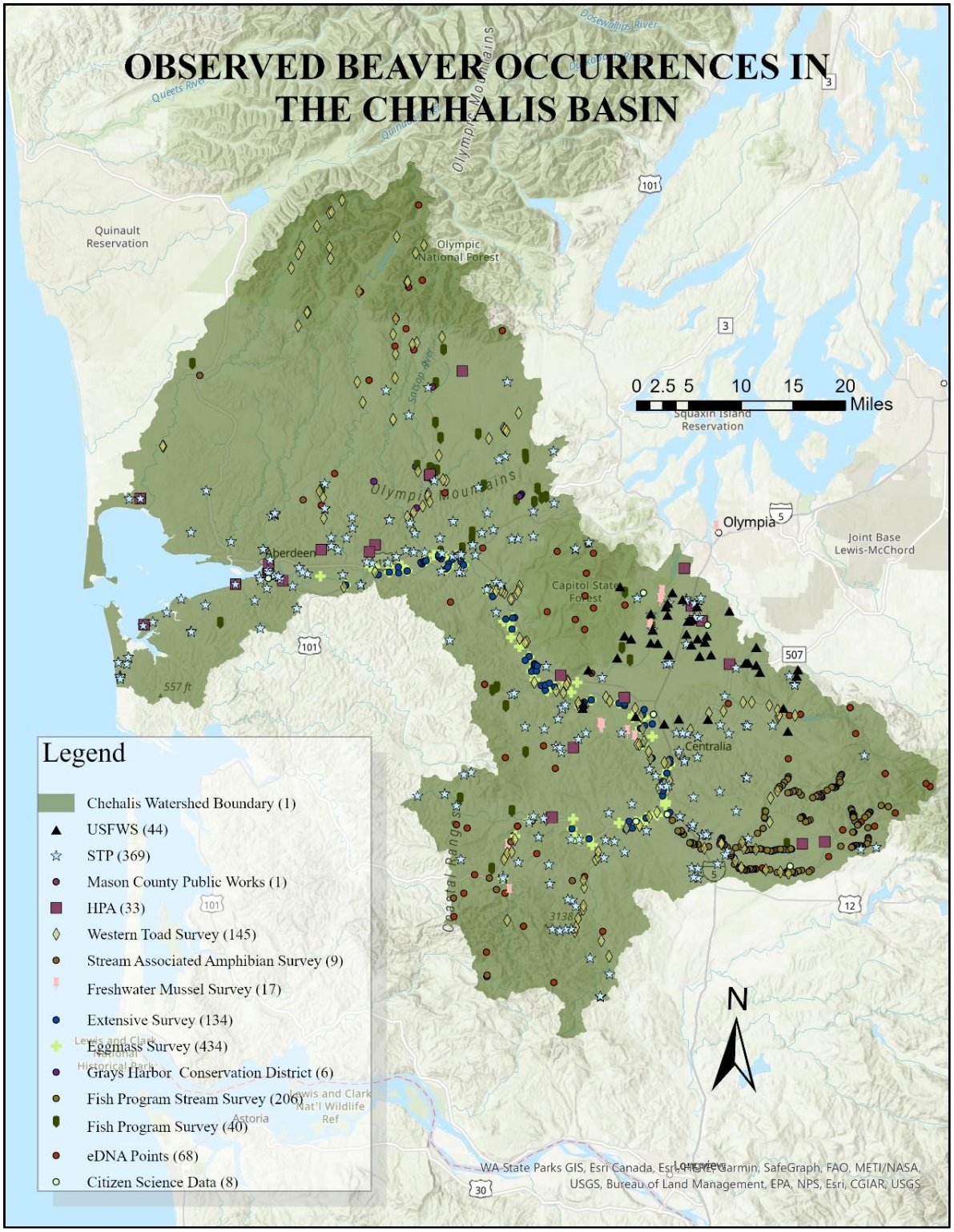

Figure 8 – Observed Beaver Occurrences - This map depicts all point data currently available from diverse sources. These observations range from an actual beaver sighting to observations of beaver chewed sticks and branches.

In aligning near-term implementation period areas with beaver observational data, restoration practitioners can more accurately gauge where restoration would be most impactful while simultaneously avoiding conflict. To further this goal, the Chehalis Basin would benefit from a thorough status assessment of beaver activity and beaver populations. Insights into the Basin's beaver population largely come from incidental observations which limits robust inferences into population size and trajectory of the species. Additionally, our landowner survey found that respondents who reportedly experience conflict with beaver also perceive that beaver damage is increasing. This could perhaps suggest that beaver populations are increasing in some areas and leading to more conflict. However, whether this perceived increase in conflict reflects a true increase in beaver damage and beaver populations requires systematic research on the status of beaver.

In the absence of targeted research, developing a beaver occurrence database to track beaver activity should be a priority. A tool crafted as a part of this project includes an incidental beaver monitoring survey (Appendix C), adapted from Petro and Stevenson's beaver activity survey protocol produced through Oregon State University (2020). This app-based survey is a quick and simple tool that will allow for the collection of specified pieces of information in three minutes or less. With this tool, WDFW can compile accurate beaver data internally as well as solicit the help of citizen scientists. Further, this tool might help mitigate conflict by engaging landowners in the data collection process and guiding restoration efforts.

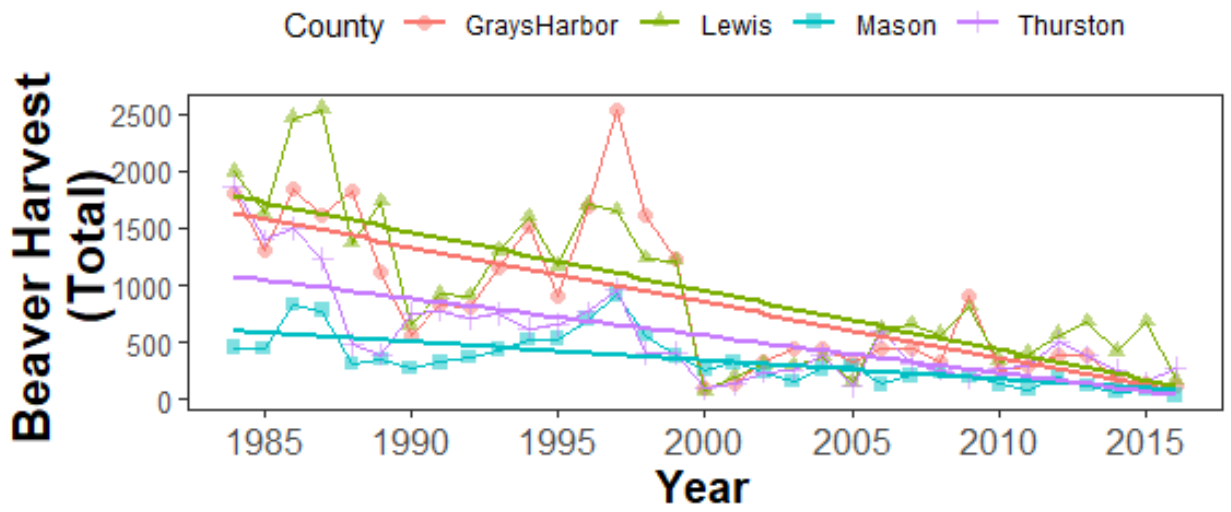

Figure 9 – Recreational Trapping Trends. The number of total beavers trapped each year through 1984-2018 in each of the four main counties comprising the Chehalis Basin.

Conclusion

Diverse fish and wildlife species rely on habitat that is created or modified by beaver. Unfortunately, beaver and beaver-created habitat – including in the Chehalis Basin – has been dramatically lost (Gardner & Finlayson 2018). Despite the critical benefits for wildlife and fish habitat that beaver provide, human-beaver relationships are complex. As illustrated in our survey of landowners in the Chehalis Basin, some members of the community appreciate beaver and desire more beaver in their area whereas others – especially those facing conflict with beaver – want fewer beaver and less beaver-associated habitat. With declining trapping and increased restoration

in the Chehalis Basin, beaver populations are likely to increase. An increase in beaver has the potential to provide continued, potent synergies with habitat restoration and aquatic species recovery actions. But more beaver also has the potential to enhance human-beaver conflict in the Basin.

Despite differences among Chehalis Basin residents in attitudes towards beaver, our survey also uncovered strong agreement on values towards wildlife more broadly. Out of nearly 400 respondents, well over 90% report noticing birds and wildlife every day and that and wildlife are important part of their communities. Further, most Chehalis respondents express positive attitudes towards (potentially) less charismatic species like amphibians. And nearly all respondents agree that future generations in the Chehalis Basin should have an abundance of wildlife available to them. These shared values among Chehalis Basin residents underscore the importance of work occurring under the ASRP to restore aquatic habitat and species.

These shared values also highlight the importance of beaver in facilitating more habitat and wildlife in the Basin, in addition to the benefit wildlife provide to people. This illustrates the urgent need to invest in education and community engagement surrounding beaver conflict mitigation approaches and in supporting and promoting practitioners who can do this work in the Basin. This sentiment aligns with Indigenous perspectives that people generally appreciate wildlife and will become increasingly comfortable with species like beaver if we can reduce conflict (D. Bingaman on behalf of the Quinault Indian Nation, *pers. comm.*). Further, the dearth of rigorous data on beaver abundance and distribution in the Chehalis impairs our ability to document the status and trends of Chehalis Basin beaver populations, how restoration actions influence beaver, and where we can target future community engagement and restoration actions. Beavers play an essential role in diverse communities and for successful restoration in the Chehalis Basin, and our work offers guidance on how the Basin can continue to benefit from beaver while mitigating potential conflict with landowners.

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Appendix A - Survey Questions

Question #	Question	Question Response Options
1	Do you know beavers are living in the Chehalis Basin?	Yes, No
2	Have you ever experienced a problem at or around your home that resulted from beaver or beaver activity?	Yes, No
3	Approximately how many times have you experienced property damage from beavers?	Comment
4	Overall, how would you describe the severity of the problems you experienced with beavers?	Light to severe, sliding scale
5	What types of beaver-related property damage have you personally experienced?	Select one or multiple • Flooding of a basement, well, or septic system • Flooding of a private road or driveway • Damage to individual trees or woodlots • Private lake/pond damaged or caused to overflow • Flooding that damaged crops, crop fields, or a crop field drainage system • Plugged culvert pipes • Other
6	What actions have you taken to control property damage or nuisance problems caused by beavers?	Select one or multiple • I have taken no action to control the problems • I have contacted someone for information about beaver control methods • I have contacted the WDFW for a permit to remove beavers or beaver dams • I have tried to remove beavers myself • I have tried to control water levels by installing water control devices in dams by myself • I have hired a private Wildlife Control Operator to remove beavers • I have hired a private contractor to control water levels by installing water control devices in dams • Other
7	Would you ever consider having beavers translocated to your property?	Yes, No
8	Beavers create environments that benefit other wildlife	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
9	Beaver damage to roads and bridges is a problem	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
10	People get enjoyment from seeing beaver activity	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree

11	Drinking water contaminated by beaver flooding exposes people to diseases	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
12	Wildlife managers should:	
13	Promote wildlife diversity by enhancing habitat for beavers	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
14	Maintain beaver-created areas as a way to benefit other wildlife	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
15	Reduce the cost of beaver damage to roads and bridges	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
16	Relocate beavers to reduce human conflicts	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
17	Lethally remove beaver to reduce human conflict	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
18	Create opportunities for the public to see beaver activity	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
19	Ensure that beaver flooding does not contaminate drinking water	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
20	In the area where I live:	
21	Beavers are common	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
22	There are too many beavers	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
23	Beavers are a nuisance	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
24	Beavers have a right to exist	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
25	Beavers are a sign of a healthy environment	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
26	Beaver populations should be left alone	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
27	Beaver populations should be controlled	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
28	No beaver should be killed	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
29	People don't want a wetland near their home because it could become a haven for beavers	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
30	Residents should learn to live with beavers	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
31	The presence of beavers make it a burden to have a wetland near your home	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
32	In your opinion, what best describes the extent of beaver damage in the county over the last five years?	Greatly Increased, Slightly Increased, Remained the same, Slightly Decreased, Greatly Decreased
33	Which number below best represents your preference for the future population of beavers in the Chehalis Basin?	No Beavers, 50% less, Current beaver, 50% more, Twice as many
34	To what extent do you agree or disagree that TAKING NO IMMEDIATE ACTION would be justified for each situation described below?	
35	NO ACTION IF: A beaver is seen in my yard	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
36	NO ACTION IF: A beaver floods a public road	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
37	NO ACTION IF: A beaver damages my private property (trees, well, etc.)	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree

38	NO ACTION IF: A beaver carries a disease that is harmful to humans	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
39	To what extent do you agree or disagree that INSTALLING DRAINAGE PIPES TO CONTROL WATER LEVELS BEHIND A BEAVER DAM would be justified for each situation described below?	
40	CONTROL WATER LEVELS IF: A beaver is seen in my yard	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
41	CONTROL WATER LEVELS IF: A beaver floods a public road	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
42	CONTROL WATER LEVELS IF: A beaver damages my private property (trees, well, etc.)	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
43	CONTROL WATER LEVELS IF: A beaver carries a disease that is harmful to humans	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
44	To what extent do you agree or disagree that LETHAL CONTROL OF BEAVER would be justified for each situation described below?	
45	LETHAL CONTROL IF: A beaver is seen in my yard	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
46	LETHAL CONTROL IF: A beaver floods a public road	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
47	LETHAL CONTROL IF: A beaver damages my private property (trees, well, etc.)	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
48	LETHAL CONTROL IF: A beaver carries a disease that is harmful to humans	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
49	Indicate the extent to which you agree or disagree with the following statements of your beliefs about wildlife.	
50	Having wildlife around my home is important to me	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
51	I notice birds and wildlife around me every day	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
52	I like having amphibians, such as frogs, near my home	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
53	I enjoy hearing frogs calling near my home	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
54	It is important for humans to manage wild animal populations	
55	If wildlife populations are not in danger of extinction, we should have the opportunity to use them to add to the quality of human life	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
56	Whether or not I get to see wildlife as much as I like, it is important to know it exists in the Chehalis Basin	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
57	An important part of my community is the wildlife I see from time to time	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
58	Although wildlife may have certain rights, human needs are more important than the rights of wildlife	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
59	It is important to know that there are healthy populations of wildlife in the Chehalis Basin	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
60	The rights of wildlife are more important than the human use of wildlife	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
61	It is acceptable for human use to cause the loss of some individual wild animals if populations are not jeopardized	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
62	Participation in regulated hunting is cruel and inhumane animals	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree

63	The rights of people and the rights of wildlife are equally important	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
64	Participation in regulated hunting helps people appreciate wildlife and natural processes	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
65	Humans should manage wild animal populations for the benefit of all people	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
66	We should ensure future generations in the Chehalis Basin will have an abundance of wildlife	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
67	Participation in regulated hunting allows people to feel more self-reliant	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
68	I consider myself to be a conservationist	Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree
69	How many years have you lived in your current town?	Number
70	How many years have you lived in The Chehalis Basin?	Number
71	Are you a:	Select one or multiple: hunter, angler, fur trapper, none of the above
72	In the past year, have you taken 1 or more trips more than 1 mile from home specifically to watch wildlife (excluding zoos or hunting/fishing trips)?	Yes, No
73	Do you own or rent the residence that you currently live in?	own, rent, other
74	What is your highest formal education level?	High School/GED, Some College, Associate's Degree, Bachelor's Degree, Graduate or professional Degree
75	What is your gender identity?	Male, Female, transgender, Other, prefer not to answer
76	What is your age?	18-25, 26-35, 36-45, 46-55, 56-65, 66-75, over 75, prefer not to answer
77	What is your race?	White, Black or African American, Hispanic, Latino, or Spanish, Asian, American Indian or Alaskan Native, Other, prefer not to answer
78	Are you interested in learning more about the following topics? -Restoration opportunities that help create beaver habitat -Solutions to beaver conflict that don't require lethal removal If you are interested in these topics, please provide your contact information.	Email: Phone: Address:

Appendix B - Example of Survey Letter

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Mailing Address: PO Box 43200, Olympia, WA 98504-3200 · 360 902-2200 · TDD 360 902-2207
Main Office Location: Natural Resources Building, 1111 Washington Street, Olympia, WA

Dear Neighbor:

The Washington Department of Fish and Wildlife wants to hear from you! We value your opinion on projects happening in your area and invite you to participate in a short survey.

This survey is intended to help us better understand your community's perceptions and views on beavers in the Chehalis Basin. As you may know, beavers are very influential to the landscape, creating wetland habitat that benefits many wildlife and plant species. However, beavers can also become a problem for people if their dam building activity or eating habits flood or damage property.

We want to hear from you!

Please have one adult per household complete the survey. To help maximize our random sampling for the survey, select the adult who has a birthday closest to today's date.

To take the survey, scan the QR code below with your smartphone's camera or visit:

https://publicinput.com/beaver1

We appreciate your participation and feedback. **Survey closing date is April 17th**. If you experience challenges accessing the survey, please call our Habitat Program at 360-902-2415.

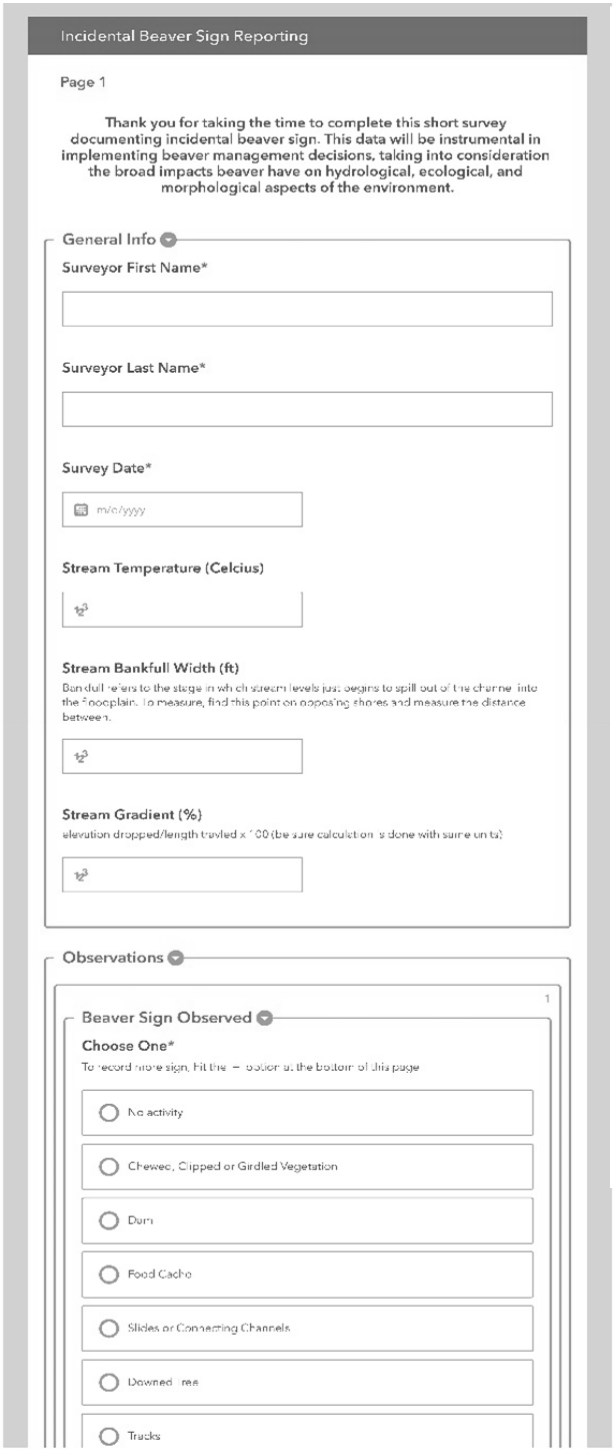
To learn more about living with beavers and preventing conflict, visit wdfw.wa.gov/species-habitats/species/castor-canadensis

Thank you,

Morgan Krueger
Habitat Program Biologist
Washington Department of Fish and Wildlife
beaver1@PublicInput.com | wdfw.wa.gov

Individuals who need to receive this information in an alternative format, language, or who need reasonable accommodations to participate in WDFW-sponsored public meetings or other activities may contact the Title VI/ADA Compliance Coordinator by phone at 360-902-2349, TTY (711), or email (Title6@dfw.wa.gov). For more information, see https://wdfw.wa.gov/accessibility/requests-accommodation.

Appendix C - Incidental Sign Survey



Incidental Beaver Sign Reporting

Reference Images

Past Canal Example

Current Canal Example

Current Scent Mound Example

Current Slide Example

Recent Slide Example

Past Slide Example

Beaver Track Example

Beaver Scat Example

Bank Den Example

This survey and images shown are modified from Petro, V. and J. Stevenson. 2020. American beaver Activity Survey Protocol for the Pacific Northwest. Version 3.0. Oregon State University. 23p

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Appendix D – Wildlife Attitude Results

Having wildlife around my home is important to me.	BC	BP	BS
Agree	84%	88%	89%
Disagree	5%	3%	2%

I notice birds and other wildlife around me every day.	BC	BP	BS
Agree	96%	98%	98%
Disagree	1%	0%	2%

I like having amphibians, such as frogs, near my home.	BC	BP	BS
Agree	68%	88%	81%
Disagree	8%	3%	5%

I enjoy hearing frogs calling near my home.	BC	BP	BS
Agree	67%	91%	84%
Disagree	10%	0%	2%

It is important for humans to manage wild animal populations.	BC	BP	BS
Agree	81%	58%	49%
Disagree	7%	13%	30%

If wildlife populations are not in danger of extinction, we should have the opportunity to use them to add to the quality of human life.	BC	BP	BS
Agree	73%	63%	46%
Disagree	8%	16%	20%

Whether or not I get to see wildlife as much as I like, it is important to know it exists in the Chehalis Basin.	BC	BP	BS
Agree	82%	97%	97%
Disagree	3%	0%	0%

An important part of my community is the wildlife I see from time to time.	BC	BP	BS
Agree	87%	98%	96%
Disagree	4%	1%	0%

Although wildlife may have certain rights, most human needs are more important than the rights of wildlife.	BC	BP	BS
Agree	64%	33%	21%
Disagree	18%	42%	56%

It is important to know that there are healthy populations of wildlife in the Chehalis Basin.	BC	BP	BS
Agree	87%	95%	93%
Disagree	2%	0%	0%

The rights of wildlife are more important than the human use of wildlife.	BC	BP	BS
Agree	13%	35%	46%
Disagree	69%	30%	19%

It is acceptable for human use to cause the loss of some individual wild animals as long as populations are not jeopardized.	BC	BP	BS
Agree	78%	48%	38%
Disagree	9%	24%	32%

Participation in regulated hunting is cruel and inhumane to animals.	BC	BP	BS
Agree	5%	9%	18%
Disagree	87%	69%	50%

The rights of people and the rights of wildlife are equally important.	BC	BP	BS
Agree	19%	48%	62%
Disagree	62%	28%	20%

Participation in regulated hunting helps people appreciate wildlife and natural processes.	BC	BP	BS
Agree	82%	61%	43%
Disagree	6%	16%	30%

Humans should manage wild animal populations for the benefit of all people.	BC	BP	BS
Agree	72%	58%	52%
Disagree	9%	18%	27%

We should be sure future generations in the Chehalis Basin will have an abundance of wildlife.	BC	BP	BS
Agree	86%	98%	93%
Disagree	1%	0%	0%

Participation in regulated hunting allows people to feel more self-reliant.	BC	BP	BS
Agree	77%	59%	29%
Disagree	9%	16%	33%

I consider myself to be a conservationist.	BC	BP	BS
Agree	82%	80%	86%
Disagree	4%	5%	0%

Wildlife Attitude Statement. Survey groups' responses to wildlife attitude statements. Tukey's post-hoc test was used to explore the survey group with the most significant responses, shown through grey highlighting. The darkest highlight is the lowest proportion responding a certain way, or "a", while the lightest highlight is the highest proportion or "c", with medium grey representing the intermediate proportion between the two or "b". The yellow highlight represents equal significance.

Appendix E: Socially Acceptable Mitigation Tactic Responses

Scenario	*Intervention*	*Agree*	*Disagree*	*Neutral*
A beaver is seen in my yard				
	No Action	**BC vs BP** | **BC vs BS** | **BP vs BS**	**BC vs BP** | **BC vs BS** | BP vs BS	BC vs BP | **BC vs BS** | **BP vs BS**
	Management Control	BC vs BP | BC vs BS | BP vs BS	**BC vs BP** | BC vs BS | BP vs BS	BC vs BP | **BC vs BS*** | BP vs BS
	Lethal Action	**BC vs BP** | **BC vs BS** | BP vs BS	**BC vs BP** | **BC vs BS** | BP vs BS	BC vs BP | BC vs BS | BP vs BS
A beaver floods a public road				
	No Action	BC vs BP | BC vs BS | BP vs BS	**BC vs BP** | **BC vs BS** | BP vs BS	**BC vs BP*** | BC vs BS | BP vs BS
	Management Control	**BC vs BP** | **BC vs BS** | BP vs BS	**BC vs BP** | **BC vs BS** | **BP vs BS**	BC vs BP | BC vs BS | BP vs BS
	Lethal Action	**BC vs BP** | **BC vs BS** | BP vs BS	**BC vs BP** | **BC vs BS** | BP vs BS	BC vs BP | BC vs BS | BP vs BS
A beaver damages my private property (trees, well, etc.)				
	No Action	**BC vs BP** | **BC vs BS*** | BP vs BS	**BC vs BP** | **BC vs BS** | BP vs BS	**BC vs BP** | BC vs BS | BP vs BS
	Management Control	BC vs BP | BC vs BS | BP vs BS	**BC vs BP** | **BC vs BS*** | BP vs BS	BC vs BP | BC vs BS | BP vs BS
	Lethal Action	**BC vs BP** | **BC vs BS** | **BP vs BS***	**BC vs BP** | **BC vs BS** | **BP vs BS**	BC vs BP | BC vs BS | BP vs BS
A beaver caries a disease that is harmful to humans				
	No Action	**BC vs BP** | BC vs BS | BP vs BS	**BC vs BP** | **BC vs BS** | BP vs BS	BC vs BP | BC vs BS | BP vs BS
	Management Control	BC vs BP | BC vs BS | BP vs BS	**BC vs BP** | **BC vs BS** | BP vs BS	BC vs BP | BC vs BS | BP vs BS
	Lethal Action	**BC vs BP** | **BC vs BS** | BP vs BS	**BC vs BP** | **BC vs BS** | BP vs BS	BC vs BP | BC vs BS | BP vs BS

Socially Acceptable Mitigation Tactic Response Significance. Survey respondent answer choices to beaver conflict scenarios. The bolded groupings represent statistical significance. BC represents the Conflict group, BP represents the Present group, and BS represents the Scarce group. Percentages can be found in Table 6 below. * - denotes approaching statistical significance

Conflict Group

Scenario	*Intervention*	*n =*	*Acceptable*	*Unacceptable*
A beaver is seen in my yard				
	No Action	194	38%	38%
	Management Control	187	40%	36%
	Lethal Action	186	47%	30%
A beaver floods a public road				
	No Action	195	11%	78%
	Management Control	186	62%	30%
	Lethal Action	185	71%	17%
A beaver damages my private property (trees, well, etc.)				
	No Action	188	13%	76%
	Management Control	186	53%	31%
	Lethal Action	185	75%	17%
A beaver caries a disease that is harmful to humans				
	No Action	191	9%	76%
	Management Control	184	48%	33%
	Lethal Action	186	79%	9%

Present Group

Scenario	*Intervention*	*n =*	*Acceptable*	*Unacceptable*
A beaver is seen in my yard				
	No Action	116	68%	16%
	Management Control	114	46%	19%
	Lethal Action	111	13%	67%
A beaver floods a public road				
	No Action	117	20%	57%
	Management Control	114	73%	8%
	Lethal Action	110	30%	50%
A beaver damages my private property (trees, well, etc.)				
	No Action	118	28%	45%
	Management Control	113	62%	16%
	Lethal Action	108	37%	47%
A beaver caries a disease that is harmful to humans				
	No Action	116	22%	54%
	Management Control	108	63%	14%
	Lethal Action	109	54%	28%

Scarce Group

Scenario	*Intervention*	*n =*	*Acceptable*	*Unacceptable*
A beaver is seen in my yard				
	No Action	62	69%	8%
	Management Control	62	35%	19%
	Lethal Action	58	5%	81%
A beaver floods a public road				
	No Action	63	19%	57%
	Management Control	62	84%	0%
	Lethal Action	59	17%	65%
A beaver damages my private property (trees, well, etc.)				
	No Action	61	29%	47%
	Management Control	61	61%	16%
	Lethal Action	58	17%	71%
A beaver caries a disease that is harmful to humans				
	No Action	62	19%	53%
	Management Control	57	63%	13%
	Lethal Action	59	41%	36%

Socially Acceptable Mitigation Tactic Responses. These three tables represent all scenarios and all responses chosen by each specific survey response group (Conflict, Present, and Scarce).

Appendix F - Demographic Information

It is also of value to consider the basic demographic information of those willing to include this in their survey responses. 203 out of 573 survey respondents chose to give demographic information regarding: age, race, gender, highest formal education level achieved, and marital status. 57% of these respondents were above the age of 55, 86% were predominantly white, 60% identified as male while 39% identified as female, 43% had achieved a bachelor's degree or higher, and 75% were married. Additionally, 92% of respondents owned their current home. This small sample size (n=203) does not represent the entire population of the Chehalis Basin or the respondents surveyed. Because of this, practitioners should bear in mind the uniqueness of every situation they encounter and that these survey results do not represent all individuals throughout the basin.

Appendix G – Binomial Analysis Statistical Results

*Below are data output from R for all survey responses that are analyzed by binomial generalized linear models where survey answers were aggregated into a binary variable (Yes/No, Agree/Disagree). Significant differences between Conflict, Present, and Scarce groups are indicated with bold, underlined text and **. Marginally significant results (0.05 < p < 0.1) are indicated with italics. The same data are re-analyzed below using a multinomial generalized linear model.*

Q 1. Do you know beavers are living in the Chehalis Basin? (Yes or No answer choice)

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-0.6931	0.4274	-1.622	0.2337
Beaver_Conflict - Beaver_Present == 0	0.6971	0.3274	2.129	*0.0827 .*
Beaver_Conflict - Beaver_Scarce == 0	1.3903	0.4247	3.273	**0.0030 ****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R1)

Beaver_Present	Beaver_Scarce	Beaver_Conflict
"ab"	"a"	"b"

Q 2. Have you ever experienced a problem at or around your home that resulted from beaver or beaver activity? (Yes or No answer choice)

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-0.4726	0.5084	-0.930	0.6094
Beaver_Conflict - Beaver_Present == 0	0.5326	0.2534	2.102	*0.0835 .*
Beaver_Conflict - Beaver_Scarce == 0	1.0052	0.4840	2.077	*0.0885* .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R2)

Beaver_Present	Beaver_Scarce	Beaver_Conflict

"a" "a" "a"

Q 3. Answer via comment, not feasible to analyze via binomial model

Q 4. Answer sliding scale out of 100, not feasible to analyze via binomial model

Q 5. Multiple answer choice selections, not feasible to analyze via binomial model

Q 6. Multiple answer choice selections, not feasible to analyze via binomial model

Q 7. Would you ever consider having beavers translocated to your property? (Yes or No answer choice)

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-0.1001	0.4282	-0.234	0.9697
Beaver_Conflict - Beaver_Present == 0	-0.8095	0.2797	-2.894	**0.0103 ***
Beaver_Conflict - Beaver_Scarce == 0	-0.7094	0.4221	-1.681	0.2073

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R7)

Beaver_Present	Beaver_Scarce	Beaver_Conflict
"b"	"ab"	"a"

Q 8. Beavers create environments that benefit other wildlife (agree and strongly agree combined, disagree and strongly disagree combined)

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	15.9902	1211.2236	0.013	1.00
Beaver_Conflict - Beaver_Present == 0	-1.0943	0.4504	-2.430	**0.03 ***
Beaver_Conflict - Beaver_Scarce == 0	-17.0845	1211.2236	-0.014	1.00

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R8)

Beaver_Present	Beaver_Scarce	Beaver_Conflict

"b" "ab" "a"

Q 9. Beaver damage to roads and bridges is a problem (agree and strongly agree combined, disagree and strongly disagree combined)

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	0.02247	0.52488	0.043	0.9990
Beaver_Conflict - Beaver_Present == 0	1.40877	0.31385	4.489	**<0.001 *** **
Beaver_Conflict - Beaver_Scarce == 0	1.38629	0.52249	2.653	**0.0206 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R9)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "b"

Q 10. People get enjoyment from seeing beaver activity

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-0.1018	1.1746	-0.087	0.9956
Beaver_Conflict - Beaver_Present == 0	-2.5543	0.6167	-4.142	**<0.001 *** **
Beaver_Conflict - Beaver_Scarce == 0	-2.4525	1.0354	-2.369	**0.0433 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R10)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "b" "a"

Q 11. Drinking water contaminated by beaver flooding exposes people to diseases

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 0.08082 0.55318 0.146 0.9879

Beaver_Conflict - Beaver_Present == 0 1.57996 0.31053 5.088 **<0.001 ***

Beaver_Conflict - Beaver_Scarce == 0 1.49914 0.54622 2.745 **0.0154 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R11)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "b"

Q 13 – Q 19 : Wildlife Managers Should…

Q 13. Promote wildlife diversity by enhancing habitat for beavers

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 15.7243 775.8709 0.020 1

Beaver_Conflict - Beaver_Present == 0 -2.0710 0.3411 -6.072 **2.52e-09 ***

Beaver_Conflict - Beaver_Scarce == 0 -17.7953 775.8708 -0.023 1

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R13)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "ab" "a"

Q 14. Maintain beaver-created areas as a way to benefit other wildlife

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 1.3004 1.0643 1.222 0.41676

Beaver_Conflict - Beaver_Present == 0 -1.8495 0.3496 -5.291 **< 0.001 ***

Beaver_Conflict - Beaver_Scarce == 0 -3.1499 1.0318 -3.053 **0.00498 ****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R14)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "b" "a"

Q 15. Reduce the cost of beaver damage to roads and bridges

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 0.5188 0.8214 0.632 0.796

Beaver_Conflict - Beaver_Present == 0 0.7296 0.4278 1.705 0.193

Beaver_Conflict - Beaver_Scarce == 0 0.2108 0.8069 0.261 0.962

(Adjusted p values reported -- single-step method)

> cld(R15)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "a"

Q 16. Relocate beavers to reduce human conflicts

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.94309 0.44956 -2.098 *0.08732* .

Beaver_Conflict - Beaver_Present == 0 -0.89430 0.29093 -3.074 **0.00546 ****

Beaver_Conflict - Beaver_Scarce == 0 0.04879 0.41738 0.117 0.99232

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R16)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "ab" "b"

Q 17. Lethally remove beaver to reduce human conflict

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.9426 0.6534 -1.443 0.304

Beaver_Conflict - Beaver_Present == 0 1.9560 0.2933 6.670 **<0.001 *****

Beaver_Conflict - Beaver_Scarce == 0 2.8986 0.6301 4.600 **<0.001 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R17)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "b"

Q 18. Create opportunities for the public to see beaver activity

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 16.1366 824.9207 0.020 1

Beaver_Conflict - Beaver_Present == 0 -1.6088 0.3251 -4.949 **1.49e-06 *****

Beaver_Conflict - Beaver_Scarce == 0 -17.7454 824.9206 -0.022 1

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R18)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "ab" "a"

Q 19. Ensure that beaver flooding does not contaminate drinking water

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 0.07077 0.83646 0.085 0.996

Beaver_Conflict - Beaver_Present == 0 0.52571 0.53673 0.979 0.583

Beaver_Conflict - Beaver_Scarce == 0 0.45495 0.82181 0.554 0.841

(Adjusted p values reported -- single-step method)

> cld(R19)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "a"

Beaver attitude statements (Q21-Q31)

In the area where I live:

Q 21. Beavers are common

Beaver_Conflict Beaver_Present Beaver_Scarce
"b" "a" "a"
> summary(Q21)
Simultaneous Tests for General Linear Hypotheses
Multiple Comparisons of Means: Tukey Contrasts
Fit: glm(formula = Agree_Disagree ~ Group, family = binomial, data = Q21)
Linear Hypotheses:
Estimate Std. Error z value Pr(>|z|)
Beaver_Present - Beaver_Conflict == 0 -1.3001 0.3657 -3.556 **0.00109 ****
Beaver_Scarce - Beaver_Conflict == 0 -1.9265 0.3991 -4.827 **< 1e-04 *****
Beaver_Scarce - Beaver_Present == 0 -0.6264 0.3722 -1.683 0.21125

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- single-step method)

Q 22. There are too many beavers

Beaver_Conflict Beaver_Present Beaver_Scarce
"c" "b" "a"
Simultaneous Tests for General Linear Hypotheses
Fit: glm(formula = Agree_Disagree ~ Group, family = binomial, data = Q22)
Estimate Std. Error z value Pr(>|z|)

Beaver_Present - Beaver_Conflict == 0	-1.6874	0.2880	-5.859	**<0.001 *** **
Beaver_Scarce - Beaver_Conflict == 0	-3.5445	0.7412	-4.782	**<0.001 *** **
Beaver_Scarce - Beaver_Present == 0	-1.8571	0.7607	-2.441	**0.0346 ***

(Adjusted p values reported -- single-step method)				

Q 23. Beavers are a nuisance

Linear Hypotheses:				
	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Present – Beaver_Conflict == 0	-1.8942	0.2859	-6.626	**<0.001 *** **
Beaver_Scarce – Beaver_Conflict == 0	-3.0433	0.5461	-5.572	**<0.001 *** **
Beaver_Scarce – Beaver_Present == 0	-1.1491	0.5726	-2.007	0.104

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
(Adjusted p values reported – single-step method)				
> cld(Q23)				
Beaver_Conflict	Beaver_Present	Beaver_Scarce		
"b"	"a"	"a"		

Q 24. Beavers have a right to exist

Linear Hypotheses:				
	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Present – Beaver_Conflict == 0	1.2512	0.3953	3.165	**0.00416 ** **
Beaver_Scarce – Beaver_Conflict == 0	2.1556	0.7438	2.898	**0.00928 ** **
Beaver_Scarce – Beaver_Present == 0	0.9045	0.7992	1.132	0.47996

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
(Adjusted p values reported – single-step method)				
> cld(Q24)				
Beaver_Conflict	Beaver_Present	Beaver_Scarce		
"a"	"b"	"b"		

Q 25. Beavers are a sign of a healthy environment

Linear Hypotheses:				
	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Present - Beaver_Conflict == 0	1.6087	0.4332	3.714	**<0.001 *** **
Beaver_Scarce - Beaver_Conflict == 0	2.1089	0.7452	2.830	**0.0117 ***

Beaver_Scarce - Beaver_Present == 0 0.5002 0.8201 0.610 0.8074

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
(Adjusted p values reported -- single-step method)
> cld(Q25)
Beaver_Conflict Beaver_Present Beaver_Scarce
"a" "b" "b"

Q 26. Beaver populations should be left alone

Linear Hypotheses:
Estimate Std. Error z value Pr(>|z|)
Beaver_Present - Beaver_Conflict == 0 2.1029 0.2922 7.196 **<0.001 *****
Beaver_Scarce - Beaver_Conflict == 0 3.7671 0.6220 6.057 **<0.001 *****
Beaver_Scarce - Beaver_Present == 0 1.6642 0.6400 2.600 **0.023 ***

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
(Adjusted p values reported -- single-step method)
> cld(Q26)
Beaver_Conflict Beaver_Present Beaver_Scarce
"a" "b" "c"

Q 27. Beaver populations should be controlled

Linear Hypotheses:
Estimate Std. Error z value Pr(>|z|)
Beaver_Present - Beaver_Conflict == 0 -2.2156 0.3065 -7.229 **<1e-04 *****
Beaver_Scarce - Beaver_Conflict == 0 -2.7747 0.4054 -6.845 **<1e-04 *****
Beaver_Scarce - Beaver_Present == 0 -0.5591 0.4286 -1.305 0.388

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
(Adjusted p values reported -- single-step method)
> cld(Q27)
Beaver_Conflict Beaver_Present Beaver_Scarce
"b" "a" "a"

Q 28. No beavers should be killed

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)				
Beaver_Present - Beaver_Conflict == 0	2.1553	0.2802	7.692	**<0.001 *** **
Beaver_Scarce - Beaver_Conflict == 0	3.3283	0.4406	7.554	**<0.001 *** **
Beaver_Scarce - Beaver_Present == 0	1.1730	0.4551	2.577	**0.0258 * **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
(Adjusted p values reported -- single-step method)				
"a" "b" "c"				

Q 29. People don't want a wetland near their home because it could become a haven for beavers

Linear Hypotheses:				
Estimate Std. Error z value Pr(>|z|)				
Beaver_Present - Beaver_Conflict == 0	-1.4282	0.3314	-4.310	**<0.001 *** **
Beaver_Scarce - Beaver_Conflict == 0	-2.3971	0.5597	-4.283	**<0.001 *** **
Beaver_Scarce - Beaver_Present == 0	-0.9689	0.6009	-1.612	0.231

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
(Adjusted p values reported -- single-step method)				
> cld(Q29)				
Beaver_Conflict Beaver_Present Beaver_Scarce				
"b" "a" "a"				

Q 30. Residents should learn to live with beavers

Linear Hypotheses:				
Estimate Std. Error z value Pr(>|z|)				
Beaver_Present - Beaver_Conflict == 0	2.1646	0.3256	6.647	**<0.001 *** **
Beaver_Scarce - Beaver_Conflict == 0	3.6041	0.7409	4.865	**<0.001 *** **
Beaver_Scarce - Beaver_Present == 0	1.4395	0.7754	1.857	0.14

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
(Adjusted p values reported -- single-step method)				
> cld(Q30)				
Beaver_Conflict Beaver_Present Beaver_Scarce				
"a" "b" "b"				

Q 31. The presence of beavers make it a burden to have a wetland near your home

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)
Beaver_Present - Beaver_Conflict == 0 -1.5659 0.2937 -5.332 **<0.001 *****
Beaver_Scarce - Beaver_Conflict == 0 -3.2758 0.6252 -5.239 **<0.001 *****
Beaver_Scarce - Beaver_Present == 0 -1.7100 0.6450 -2.651 **0.0199 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- single-step method)
> cld(Q31)
Beaver_Conflict Beaver_Present Beaver_Scarce
"c" "b" "a"

Q 32. N/A

Q 33. N/A

Socially acceptable mitigation (Q35-Q48)

Q 35. NO ACTION IF: A beaver is seen in my yard

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 0.7268 0.5371 1.353 0.355

Beaver_Conflict - Beaver_Present == 0 -1.4116 0.3035 -4.650 **<1e-04 *****

Beaver_Conflict - Beaver_Scarce == 0 -2.1383 0.5001 -4.276 **<1e-04 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R35)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "b" "a"

Q 36. NO ACTION IF: A beaver floods a public road

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.04445 0.41200 -0.108 0.9936

Beaver_Conflict - Beaver_Present == 0 -0.98055 0.33936 -2.889 **0.0105 ***

Beaver_Conflict - Beaver_Scarce == 0 -0.93609 0.40945 -2.286 ***0.0570*** .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R36)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "ab" "a"

Q 37. NO ACTION IF: A beaver damages my private property (trees, well, etc.)

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.00314 0.37311 -0.008 0.99996

Beaver_Conflict - Beaver_Present == 0 -1.31101 0.31278 -4.191 **< 1e-04 *****

Beaver_Conflict - Beaver_Scarce == 0 -1.30787 0.37242 -3.512 **0.00124 ****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R37)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "b" "a"

Q 38. NO ACTION IF: A beaver carries a disease that is harmful to humans

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.1266 0.4098 -0.309 0.9485

Beaver_Conflict - Beaver_Present == 0 -1.3328 0.3516 -3.791 **<0.001 *****

Beaver_Conflict - Beaver_Scarce == 0 -1.2062 0.4277 -2.820 **0.0132 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R38)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "b" "a"

Q 40. CONTROL WATER LEVELS IF: A beaver is seen in my yard

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.3196 0.4419 -0.723 0.7457

Beaver_Conflict - Beaver_Present == 0 -0.8264 0.3081 -2.682 **0.0193 ***

Beaver_Conflict - Beaver_Scarce == 0 -0.5068 0.3965 -1.278 0.4017

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R40)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "ab" "a"

Q 41. CONTROL WATER LEVELS IF: A beaver floods a public road

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 16.3445 904.5273 0.018 1

Beaver_Conflict - Beaver_Present == 0 -2.0113 0.3774 -5.330 **1.97e-07 *****

Beaver_Conflict - Beaver_Scarce == 0 -18.3558 904.5272 -0.020 1

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R41)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "ab" "a"

Q 42. CONTROL WATER LEVELS IF: A beaver damages my private property (trees, well, etc.)

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.04979 0.44370 -0.112 0.9929

Beaver_Conflict - Beaver_Present == 0 -0.83049 0.31111 -2.669 **0.0201 ***

Beaver_Conflict - Beaver_Scarce == 0 -0.78070 0.39240 -1.990 0.1118

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R42)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "ab" "a"

Q 43. CONTROL WATER LEVELS IF: A beaver carries a disease that is harmful to humans

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	0.1907	0.4978	0.383	0.92041
Beaver_Conflict - Beaver_Present == 0	-1.0639	0.3244	-3.280	**0.00282 ****
Beaver_Conflict - Beaver_Scarce == 0	-1.2546	0.4457	-2.815	**0.01277 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R43)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "b" "a"

Q 45. LETHAL CONTROL IF: A beaver is seen in my yard

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-1.1555	0.6594	-1.752	0.176
Beaver_Conflict - Beaver_Present == 0	2.0480	0.3308	6.192	**<0.001 *****
Beaver_Conflict - Beaver_Scarce == 0	3.2035	0.6195	5.171	**<0.001 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R45)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "b"

Q 46. LETHAL CONTROL IF: A beaver floods a public road

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-0.8242	0.4181	-1.971	0.117
Beaver_Conflict - Beaver_Present == 0	1.9596	0.2972	6.594	**<0.001 *****
Beaver_Conflict - Beaver_Scarce == 0	2.7838	0.4076	6.830	**<0.001 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R46)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "b"

Q 47. LETHAL CONTROL IF: A beaver damages my private property (trees, well, etc.)

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)	
Beaver_Scarce - Beaver_Present == 0	-1.1878	0.4116	-2.886	**0.0105**	*
Beaver_Conflict - Beaver_Present == 0	1.7164	0.2907	5.904	**<0.001**	***
Beaver_Conflict - Beaver_Scarce == 0	2.9043	0.4048	7.174	**<0.001**	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R47)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "a" "c"

Q 48. LETHAL CONTROL IF: A beaver carries a disease that is harmful to humans

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)	
Beaver_Scarce - Beaver_Present == 0	-1.1878	0.4116	-2.886	**0.0109**	*
Beaver_Conflict - Beaver_Present == 0	1.7164	0.2907	5.904	**<0.001**	***
Beaver_Conflict - Beaver_Scarce == 0	2.9043	0.4048	7.174	**<0.001**	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(R48)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "a" "c"

Wildlife attitude questions (Q50-Q68)

Q 50. Having wildlife around my home is important to me

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	0.4978	1.1677	0.426	0.902
Beaver_Conflict - Beaver_Present == 0	-0.5943	0.6795	-0.875	0.648
Beaver_Conflict - Beaver_Scarce == 0	-1.0921	1.0663	-1.024	0.552

(Adjusted p values reported -- single-step method)

> cld(Q1)

Beaver_Present	Beaver_Scarce	Beaver_Conflict
"a"	"a"	"a"

Q 51. I notice birds and wildlife around me every day

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-17.559	2839.306	-0.006	1.000
Beaver_Conflict - Beaver_Present == 0	-16.396	2839.306	-0.006	1.000
Beaver_Conflict - Beaver_Scarce == 0	1.163	1.423	0.818	0.656

(Adjusted p values reported -- single-step method)

> cld(Q2)

Beaver_Present	Beaver_Scarce	Beaver_Conflict
"a"	"a"	"a"

Q 52. I like having amphibians, such as frogs, near my home

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-0.7252	0.8360	-0.867	0.6553
Beaver_Conflict - Beaver_Present == 0	-1.3430	0.6470	-2.076	***0.0922*** .
Beaver_Conflict - Beaver_Scarce == 0	-0.6178	0.6556	-0.942	0.6075

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q3)

Beaver_Present	Beaver_Scarce	Beaver_Conflict

"a" "a" "a"

Q 53. I enjoy hearing frogs calling near my home

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-15.716	1086.320	-0.014	1.000
Beaver_Conflict - Beaver_Present == 0	-17.644	1086.319	-0.016	1.000
Beaver_Conflict - Beaver_Scarce == 0	-1.928	1.042	-1.851	0.124

(Adjusted p values reported -- single-step method)

> cld(Q4)

Beaver_Present	Beaver_Scarce	Beaver_Conflict
"a"	"a"	"a"

Q 54. It is important for humans to manage wild animal populations

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-1.0051	0.4264	-2.357	**0.0484 ***
Beaver_Conflict - Beaver_Present == 0	1.0150	0.4211	2.410	**0.0421 ***
Beaver_Conflict - Beaver_Scarce == 0	2.0200	0.4296	4.702	**<0.001 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q5)

Beaver_Present	Beaver_Scarce	Beaver_Conflict
"b"	"a"	"c"

Q 55. If wildlife populations are not in danger of extinction, we should have the opportunity to use them to add to the quality of human life

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-0.5113	0.4507	-1.134	0.49160
Beaver_Conflict - Beaver_Present == 0	0.8723	0.3908	2.232	***0.06540*** .
Beaver_Conflict - Beaver_Scarce == 0	1.3835	0.4565	3.031	**0.00687 ****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q6)

Beaver_Present Beaver_Scarce Beaver_Conflict

"ab" "a" "b"

Q 56. Whether or not I get to see wildlife as much as I like, it is important to know it exists in the Chehalis Basin

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -8.206e-09 4.874e+03 0.000 1

Beaver_Conflict - Beaver_Present == 0 -1.817e+01 2.866e+03 -0.006 1

Beaver_Conflict - Beaver_Scarce == 0 -1.817e+01 3.942e+03 -0.005 1

(Adjusted p values reported -- single-step method)

> cld(Q7)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "a"

Q 57. An important part of my community is the wildlife I see from time to time

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 14.903 1450.071 0.010 1.000

Beaver_Conflict - Beaver_Present == 0 -1.547 1.076 -1.437 0.279

Beaver_Conflict - Beaver_Scarce == 0 -16.449 1450.071 -0.011 1.000

(Adjusted p values reported -- single-step method)

> cld(Q8)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "a"

Q 58. Although wildlife may have certain rights, human needs are more important than the rights of wildlife

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.7295 0.4067 -1.794 0.169

Beaver_Conflict - Beaver_Present == 0 1.5170 0.2994 5.067 **<1e-04 *****

Beaver_Conflict - Beaver_Scarce == 0 2.2465 0.3917 5.735 **<1e-04 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q9)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "b"

Q 59. It is important to know that there are healthy populations of wildlife in the Chehalis Basin

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 4.269e-08 4.950e+03 0.000 1

Beaver_Conflict - Beaver_Present == 0 -1.759e+01 2.894e+03 -0.006 1

Beaver_Conflict - Beaver_Scarce == 0 -1.759e+01 4.015e+03 -0.004 1

(Adjusted p values reported -- single-step method)

> cld(Q10)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "a"

Q 60. The rights of wildlife are more important than the human use of wildlife

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 0.7458 0.4321 1.726 0.193

Beaver_Conflict - Beaver_Present == 0 -1.7726 0.3270 -5.421 **<1e-04 *****

Beaver_Conflict - Beaver_Scarce == 0 -2.5184 0.4231 -5.953 **<1e-04 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q11)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "b" "a"

Q 61. It is acceptable for human use to cause the loss of some individual wild animals if populations are not jeopardized

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-0.5390	0.4039	-1.334	0.375087
Beaver_Conflict - Beaver_Present == 0	1.4830	0.3600	4.120	**0.000121 *****
Beaver_Conflict - Beaver_Scarce == 0	2.0220	0.4156	4.865	**< 1e-04 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q12)

Beaver_Present	Beaver_Scarce	Beaver_Conflict
"a"	"a"	"b"

Q 62. Participation in regulated hunting is cruel and inhumane animals

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	1.0636	0.5104	2.084	***0.0931 .***
Beaver_Conflict - Beaver_Present == 0	-0.7784	0.4921	-1.582	0.2535
Beaver_Conflict - Beaver_Scarce == 0	-1.8421	0.5031	-3.661	**<0.001 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q13)

Beaver_Present	Beaver_Scarce	Beaver_Conflict
"ab"	"b"	"a"

Q 63. The rights of people and the rights of wildlife are equally important

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	0.6176	0.4167	1.482	0.296
Beaver_Conflict - Beaver_Present == 0	-1.7030	0.3028	-5.624	**<1e-04 *****
Beaver_Conflict - Beaver_Scarce == 0	-2.3206	0.3983	-5.826	**<1e-04 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q14)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "b" "a"

Q 64. Participation in regulated hunting helps people appreciate wildlife and natural processes

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.9808 0.4183 -2.345 **0.04971 ***

Beaver_Conflict - Beaver_Present == 0 1.2736 0.4149 3.070 **0.00608 ****

Beaver_Conflict - Beaver_Scarce == 0 2.2545 0.4451 5.065 **< 0.001 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q15)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "a" "c"

Q 65. Humans should manage wild animal populations for the benefit of all people

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -0.4907 0.4129 -1.188 0.4594

Beaver_Conflict - Beaver_Present == 0 0.9373 0.3736 2.509 **0.0322 ***

Beaver_Conflict - Beaver_Scarce == 0 1.4280 0.4140 3.449 **0.0016 ****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q16)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "b"

Q 66. We should ensure future generations in the Chehalis Basin will have an abundance of wildlife

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -1.813e-08 8.212e+03 0.000 1

Beaver_Conflict - Beaver_Present == 0 -1.751e+01 4.772e+03 -0.004 1

Beaver_Conflict - Beaver_Scarce == 0 -1.751e+01 6.684e+03 -0.003 1

(Adjusted p values reported -- single-step method)

> cld(Q17)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "a"

Q 67. Participation in regulated hunting allows people to feel more self-reliant

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 -1.4495 0.4363 -3.322 **0.0025 ****

Beaver_Conflict - Beaver_Present == 0 0.8770 0.3807 2.303 ***0.0551 .***

Beaver_Conflict - Beaver_Scarce == 0 2.3265 0.4300 5.411 **<0.001 *****

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

> cld(Q18)

Beaver_Present Beaver_Scarce Beaver_Conflict

"b" "a" "b"

Q 68. I consider myself to be a conservationist

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

Beaver_Scarce - Beaver_Present == 0 16.6619 1639.9717 0.010 1.000

Beaver_Conflict - Beaver_Present == 0 0.2457 0.6614 0.371 0.916

Beaver_Conflict - Beaver_Scarce == 0 -16.4162 1639.9717 -0.010 1.000

(Adjusted p values reported -- single-step method)

> cld(Q19)

Beaver_Present Beaver_Scarce Beaver_Conflict

"a" "a" "a"

Q 69-71 N/A

Q 72. In the past year, have you taken 1 or more trips more than 1 mile from home specifically to watch wildlife (excluding zoos or hunting/fishing trips)? Yes/No response :

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(>|z|)
Beaver_Scarce - Beaver_Present == 0	-0.3344	0.5998	-0.558	0.838
Beaver_Conflict - Beaver_Present == 0	-0.6621	0.3689	-1.795	0.165
Beaver_Conflict - Beaver_Scarce == 0	-0.3277	0.5422	-0.604	0.813

(Adjusted p values reported -- single-step method)

> cld(R190)

Beaver_Present	Beaver_Scarce	Beaver_Conflict
"a"	"a"	"a"

Q 73-78 N/A

Appendix H – Multinomial Analysis Statistical Results

*Below are data output from R for all survey responses that are analyzed by multinomial generalized linear models where survey answers were greater than two possible answers (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree). Significant differences between Conflict, Present, and Scarce groups are indicated with bold, underlined text and **. Marginally significant results (0.05 < p < 0.1) are indicated with italics. The same data are analyzed above using a binomial generalized linear model.*

Q 1-7. N/A multinomial analysis not applicable to these data types

Q 8. Beavers create environments that benefit other wildlife

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.2149	0.0518	6	-4.149	**0.0142***
Beaver_Conflict - Beaver_Scarce	-0.2937	0.0672	6	-4.368	**0.0112***
Beaver_Present - Beaver_Scarce	-0.0788	0.0680	6	-1.159	0.5167

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.0721	0.0333	6	2.164	0.1567
Beaver_Conflict - Beaver_Scarce	0.1330	0.0248	6	5.368	**0.0041****
Beaver_Present - Beaver_Scarce	0.0609	0.0223	6	2.729	***0.0763***

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.1428	0.0460	6	3.102	**0.0480***
Beaver_Conflict - Beaver_Scarce	0.1607	0.0656	6	2.449	0.1089
Beaver_Present - Beaver_Scarce	0.0179	0.0653	6	0.274	0.9597

Q 9. Beaver damage to roads and bridges is a problem

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.2754	0.0571	6	4.821	**0.0070****

Beaver_Conflict - Beaver_Scarce 0.3583 0.0871 6 4.115 **0.0147***

Beaver_Present - Beaver_Scarce 0.0829 0.0921 6 0.901 0.6596

Response = Disagree:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.1835 0.0500 6 -3.668 **0.0244***

Beaver_Conflict - Beaver_Scarce -0.1101 0.0786 6 -1.402 0.3977

Beaver_Present - Beaver_Scarce 0.0734 0.0864 6 0.849 0.6887

Response = Neutral:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.0919 0.0520 6 -1.768 0.2578

Beaver_Conflict - Beaver_Scarce -0.2482 0.0915 6 -2.711 ***0.0781***

Beaver_Present - Beaver_Scarce -0.1563 0.0967 6 -1.616 0.3098

Q 10. People get enjoyment from seeing beaver activity

$contrasts

Response = Agree:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.31578 0.0515 6 -6.137 **0.0021****

Beaver_Conflict - Beaver_Scarce -0.32353 0.0749 6 -4.322 **0.0118***

Beaver_Present - Beaver_Scarce -0.00774 0.0748 6 -0.104 0.9941

Response = Disagree:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present 0.18113 0.0332 6 5.463 **0.0038****

Beaver_Conflict - Beaver_Scarce 0.17802 0.0414 6 4.300 **0.0121***

Beaver_Present - Beaver_Scarce -0.00311 0.0326 6 -0.095 0.9950

Response = Neutral:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present 0.13466 0.0476 6 2.828 ***0.0674***

Beaver_Conflict - Beaver_Scarce 0.14550 0.0692 6 2.102 0.1695

Beaver_Present - Beaver_Scarce 0.01085 0.0697 6 0.156 0.9868

Q 11. Drinking water contaminated by beaver flooding exposes people to diseases

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.25098	0.0562	6	4.462	**0.0102***
Beaver_Conflict - Beaver_Scarce	0.33713	0.0784	6	4.301	**0.0120***
Beaver_Present - Beaver_Scarce	0.08615	0.0815	6	1.057	0.5716

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.25117	0.0533	6	-4.710	**0.0079****
Beaver_Conflict - Beaver_Scarce	-0.10879	0.0802	6	-1.356	0.4185
Beaver_Present - Beaver_Scarce	0.14237	0.0887	6	1.606	0.3137

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.00019	0.0547	6	0.003	1.0000
Beaver_Conflict - Beaver_Scarce	-0.22834	0.0920	6	-2.483	0.1044
Beaver_Present - Beaver_Scarce	-0.22853	0.0959	6	-2.384	0.1184

Q 13-19 : Wildlife Managers Should…

Q 13. Promote wildlife diversity by enhancing habitat for beavers

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.3906	0.0544	6	-7.185	**0.0009*****
Beaver_Conflict - Beaver_Scarce	-0.4330	0.0793	6	-5.458	**0.0038****
Beaver_Present - Beaver_Scarce	-0.0424	0.0824	6	-0.515	0.8671

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3281	0.0477	6	6.877	**0.0011****
Beaver_Conflict - Beaver_Scarce	0.4463	0.0365	6	12.242	**<.0001*****

Beaver_Present - Beaver_Scarce 0.1182 0.0308 6 3.839 **0.0201***

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.0625	0.0439	6	1.424	0.3878
Beaver_Conflict - Beaver_Scarce	-0.0132	0.0769	6	-0.172	0.9839
Beaver_Present - Beaver_Scarce	-0.0757	0.0783	6	-0.967	0.6220

Q 14. Maintain beaver-created areas as a way to benefit other wildlife

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.3632	0.0537	6	-6.769	**0.0012****
Beaver_Conflict - Beaver_Scarce	-0.3887	0.0780	6	-4.983	**0.0060****
Beaver_Present - Beaver_Scarce	-0.0256	0.0794	6	-0.322	0.9451

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.2694	0.0469	6	5.749	**0.0029****
Beaver_Conflict - Beaver_Scarce	0.3493	0.0472	6	7.403	**0.0008*****
Beaver_Present - Beaver_Scarce	0.0799	0.0431	6	1.853	0.2320

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.0938	0.0413	6	2.274	0.1363
Beaver_Conflict - Beaver_Scarce	0.0395	0.0705	6	0.559	0.8457
Beaver_Present - Beaver_Scarce	-0.0543	0.0705	6	-0.771	0.7329

Q 15. Reduce the cost of beaver damage to roads and bridges

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.21351	0.0592	6	3.608	**0.0262***
Beaver_Conflict - Beaver_Scarce	0.11222	0.1053	6	1.066	0.5668

Beaver_Present - Beaver_Scarce -0.10128 0.1102 6 -0.919 0.6489

Response = Disagree:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.03231 0.0360 6 -0.897 0.6616

Beaver_Conflict - Beaver_Scarce -0.00222 0.0578 6 -0.038 0.9992

Beaver_Present - Beaver_Scarce 0.03009 0.0620 6 0.485 0.8806

Response = Neutral:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.18119 0.0574 6 -3.158 **0.0448***

Beaver_Conflict - Beaver_Scarce -0.11000 0.1013 6 -1.086 0.5559

Beaver_Present - Beaver_Scarce 0.07119 0.1071 6 0.665 0.7913

Q 16. Relocate beavers to reduce human conflicts

$contrasts

Response = Agree:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.1320 0.0602 6 -2.195 0.1507

Beaver_Conflict - Beaver_Scarce -0.0097 0.0911 6 -0.107 0.9938

Beaver_Present - Beaver_Scarce 0.1223 0.0967 6 1.265 0.4623

Response = Disagree:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present 0.1971 0.0562 6 3.510 **0.0294***

Beaver_Conflict - Beaver_Scarce -0.0354 0.0947 6 -0.374 0.9267

Beaver_Present - Beaver_Scarce -0.2325 0.0966 6 -2.407 0.1149

Response = Neutral:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.0651 0.0519 6 -1.254 0.4682

Beaver_Conflict - Beaver_Scarce 0.0451 0.0692 6 0.652 0.7980

Beaver_Present - Beaver_Scarce 0.1102 0.0755 6 1.459 0.3727

Q 17. Lethally remove beaver to reduce human conflict

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beacer_Scarce - Beaver_Conflict	-0.49246	0.0621	6	-7.933	**0.0005*** **
Beacer_Scarce - Beaver_Present	-0.11097	0.0631	6	-1.759	0.2607
Beaver_Conflict - Beaver_Present	0.38149	0.0532	6	7.173	**0.0009*** **

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beacer_Scarce - Beaver_Conflict	0.54852	0.0711	6	7.710	**0.0006*** **
Beacer_Scarce - Beaver_Present	0.11459	0.0754	6	1.520	0.3474
Beaver_Conflict - Beaver_Present	-0.43393	0.0544	6	-7.978	**0.0005*** **

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beacer_Scarce - Beaver_Conflict	-0.05606	0.0479	6	-1.170	0.5112
Beacer_Scarce - Beaver_Present	-0.00362	0.0477	6	-0.076	0.9968
Beaver_Conflict - Beaver_Present	0.05244	0.0335	6	1.564	0.3297

Q 18. Create opportunities for the public to see beaver activity

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.34719	0.0575	6	-6.036	**0.0023** **
Beaver_Conflict - Beaver_Scarce	-0.38062	0.0873	6	-4.360	**0.0113* **
Beaver_Present - Beaver_Scarce	-0.03343	0.0921	6	-0.363	0.9308

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.21966	0.0508	6	4.326	**0.0117* **
Beaver_Conflict - Beaver_Scarce	0.37853	0.0365	6	10.383	**0.0001*** **
Beaver_Present - Beaver_Scarce	0.15887	0.0353	6	4.495	**0.0098** **

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.12753	0.0506	6	2.519	***0.0996***
Beaver_Conflict - Beaver_Scarce	0.00209	0.0872	6	0.024	0.9997
Beaver_Present - Beaver_Scarce	-0.12545	0.0881	6	-1.424	0.3881

Q 19. Ensure that beaver flooding does not contaminate drinking water

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.10912	0.0531	6	2.055	0.1799
Beaver_Conflict - Beaver_Scarce	0.09130	0.0847	6	1.078	0.5604
Beaver_Present - Beaver_Scarce	-0.01782	0.0910	6	-0.196	0.9791

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.02073	0.0285	6	-0.729	0.7566
Beaver_Conflict - Beaver_Scarce	-0.01781	0.0455	6	-0.392	0.9201
Beaver_Present - Beaver_Scarce	0.00292	0.0490	6	0.060	0.9980

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.08839	0.0487	6	-1.817	0.2427
Beaver_Conflict - Beaver_Scarce	-0.07349	0.0777	6	-0.946	0.6339
Beaver_Present - Beaver_Scarce	0.01490	0.0837	6	0.178	0.9828

Beaver attitude statements (Q21-Q31)

In the area where I live:

Q 21. Beavers are common

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.2167	0.0508	6	4.268	**0.0125***
Beaver_Conflict - Beaver_Scarce	0.2999	0.0673	6	4.453	**0.0103***
Beaver_Present - Beaver_Scarce	0.0832	0.0756	6	1.100	0.5482

Response = Disagree:
contrast estimate SE df t.ratio p.value
Beaver_Conflict - Beaver_Present -0.1141 0.0383 6 -2.980 ***0.0558***
Beaver_Conflict - Beaver_Scarce -0.2253 0.0590 6 -3.818 **0.0205***
Beaver_Present - Beaver_Scarce -0.1112 0.0660 6 -1.685 0.2851
Response = Neutral:
contrast estimate SE df t.ratio p.value
Beaver_Conflict - Beaver_Present -0.1025 0.0423 6 -2.425 0.1123
Beaver_Conflict - Beaver_Scarce -0.0746 0.0528 6 -1.413 0.3928
Beaver_Present - Beaver_Scarce 0.0280 0.0603 6 0.464 0.8902

Q 22. There are too many beavers

$contrasts
Response = Agree:
contrast estimate SE df t.ratio p.value
Beaver_Conflict - Beaver_Present 0.2860 0.0480 6 5.963 **0.0024****
Beaver_Conflict - Beaver_Scarce 0.4312 0.0405 6 10.648 **0.0001*****
Beaver_Present - Beaver_Scarce 0.1453 0.0394 6 3.690 **0.0238***
Response = Disagree:
contrast estimate SE df t.ratio p.value
Beaver_Conflict - Beaver_Present -0.3098 0.0531 6 -5.830 **0.0027****
Beaver_Conflict - Beaver_Scarce -0.3734 0.0661 6 -5.653 **0.0032****
Beaver_Present - Beaver_Scarce -0.0636 0.0721 6 -0.883 0.6698
Response = Neutral:
contrast estimate SE df t.ratio p.value
Beaver_Conflict - Beaver_Present 0.0238 0.0470 6 0.507 0.8707
Beaver_Conflict - Beaver_Scarce -0.0578 0.0640 6 -0.904 0.6575
Beaver_Present - Beaver_Scarce -0.0817 0.0672 6 -1.215 0.4876

Q 23. Beavers are a nuisance

$contrasts
Response = Agree:
contrast estimate SE df t.ratio p.value
Beaver_Conflict - Beaver_Present 0.3584 0.0481 6 7.452 **0.0007*****
Beaver_Conflict - Beaver_Scarce 0.4724 0.0458 6 10.318 **0.0001*****
Beaver_Present - Beaver_Scarce 0.1140 0.0446 6 2.554 ***0.0953***

Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.3395	0.0527	6	-6.441	**0.0016****
Beaver_Conflict - Beaver_Scarce	-0.4059	0.0653	6	-6.212	**0.0019****
Beaver_Present - Beaver_Scarce	-0.0664	0.0712	6	-0.932	0.6416
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0189	0.0439	6	-0.429	0.9049
Beaver_Conflict - Beaver_Scarce	-0.0665	0.0598	6	-1.114	0.5409
Beaver_Present - Beaver_Scarce	-0.0477	0.0638	6	-0.747	0.7462

Q 24. Beavers have a right to exist

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.2021	0.0498	6	-4.058	**0.0157***
Beaver_Conflict - Beaver_Scarce	-0.2660	0.0559	6	-4.755	**0.0075****
Beaver_Present - Beaver_Scarce	-0.0639	0.0570	6	-1.121	0.5372
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.1104	0.0348	6	3.172	**0.0440***
Beaver_Conflict - Beaver_Scarce	0.1493	0.0341	6	4.383	**0.0110***
Beaver_Present - Beaver_Scarce	0.0389	0.0307	6	1.269	0.4605
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.0917	0.0429	6	2.138	0.1620
Beaver_Conflict - Beaver_Scarce	0.1167	0.0499	6	2.336	0.1259
Beaver_Present - Beaver_Scarce	0.0249	0.0507	6	0.492	0.8778

Q 25. Beavers are a sign of a healthy environment

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.2541	0.0493	6	-5.157	**0.0050****
Beaver_Conflict - Beaver_Scarce	-0.1965	0.0640	6	-3.071	**0.0498***
Beaver_Present - Beaver_Scarce	0.0576	0.0643	6	0.896	0.6622

Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.1297	0.0334	6	3.883	**0.0191***
Beaver_Conflict - Beaver_Scarce	0.1533	0.0342	6	4.482	**0.0099****
Beaver_Present - Beaver_Scarce	0.0235	0.0289	6	0.814	0.7090
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.1244	0.0437	6	2.843	***0.0661***
Beaver_Conflict - Beaver_Scarce	0.0433	0.0601	6	0.720	0.7616
Beaver_Present - Beaver_Scarce	-0.0811	0.0602	6	-1.348	0.4224

Q 26. Beaver populations should be left alone

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.3416	0.0522	6	-6.551	**0.0015****
Beaver_Conflict - Beaver_Scarce	-0.4731	0.0639	6	-7.398	**0.0008*****
Beaver_Present - Beaver_Scarce	-0.1314	0.0721	6	-1.822	0.2412
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.4081	0.0487	6	8.376	**0.0004*****
Beaver_Conflict - Beaver_Scarce	0.5565	0.0427	6	13.042	**<.0001*****
Beaver_Present - Beaver_Scarce	0.1483	0.0432	6	3.432	**0.0322**
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0665	0.0471	6	-1.411	0.3937
Beaver_Conflict - Beaver_Scarce	-0.0834	0.0612	6	-1.362	0.4160
Beaver_Present - Beaver_Scarce	-0.0169	0.0669	6	-0.253	0.9656

Q 27. Beaver populations should be controlled

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.4895	0.0481	6	10.178	**0.0001*****
Beaver_Conflict - Beaver_Scarce	0.5403	0.0551	6	9.811	**0.0002*****
Beaver_Present - Beaver_Scarce	0.0509	0.0573	6	0.888	0.6670
Response = Disagree:					

contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.2729	0.0509	6	-5.366	**0.0041**	**
Beaver_Conflict - Beaver_Scarce	-0.4090	0.0665	6	-6.149	**0.0021**	**
Beaver_Present - Beaver_Scarce	-0.1362	0.0755	6	-1.803	0.2470	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.2166	0.0492	6	-4.400	**0.0108**	*
Beaver_Conflict - Beaver_Scarce	-0.1313	0.0607	6	-2.163	0.1569	
Beaver_Present - Beaver_Scarce	0.0853	0.0700	6	1.218	0.4860	

Q 28. No beaver should be killed

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.3980	0.0517	6	-7.704	**0.0006**	***
Beaver_Conflict - Beaver_Scarce	-0.6415	0.0539	6	-11.895	**0.0001**	***
Beaver_Present - Beaver_Scarce	-0.2435	0.0639	6	-3.809	**0.0208**	*
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.4384	0.0502	6	8.733	**0.0003**	***
Beaver_Conflict - Beaver_Scarce	0.5768	0.0503	6	11.474	**0.0001**	***
Beaver_Present - Beaver_Scarce	0.1383	0.0543	6	2.547	***0.0962***	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.0404	0.0405	6	-0.999	0.6038	
Beaver_Conflict - Beaver_Scarce	0.0647	0.0377	6	1.714	0.2753	
Beaver_Present - Beaver_Scarce	0.1051	0.0446	6	2.356	0.1226	

Q 29. People don't want a wetland near their home because it could become a haven for beavers

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.24932	0.0457	6	5.451	**0.0038**	**
Beaver_Conflict - Beaver_Scarce	0.32363	0.0450	6	7.186	**0.0009**	***
Beaver_Present - Beaver_Scarce	0.07431	0.0423	6	1.757	0.2613	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	

Beaver_Conflict - Beaver_Present	-0.12589	0.0536	6	-2.349	0.1238
Beaver_Conflict - Beaver_Scarce	-0.19876	0.0689	6	-2.885	***0.0628***
Beaver_Present - Beaver_Scarce	-0.07287	0.0753	6	-0.967	0.6218

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.12343	0.0556	6	-2.221	0.1458
Beaver_Conflict - Beaver_Scarce	-0.12487	0.0699	6	-1.786	0.2520
Beaver_Present - Beaver_Scarce	-0.00144	0.0758	6	-0.019	0.9998

Q 30. Residents should learn to live with beavers

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.3329	0.0536	6	-6.215	**0.0019****
Beaver_Conflict - Beaver_Scarce	-0.4062	0.0655	6	-6.198	**0.0020****
Beaver_Present - Beaver_Scarce	-0.0733	0.0714	6	-1.026	0.5887

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3670	0.0454	6	8.092	**0.0005*****
Beaver_Conflict - Beaver_Scarce	0.4540	0.0413	6	10.983	**0.0001*****
Beaver_Present - Beaver_Scarce	0.0869	0.0359	6	2.419	0.1132

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0341	0.0482	6	-0.707	0.7683
Beaver_Conflict - Beaver_Scarce	-0.0478	0.0624	6	-0.766	0.7358
Beaver_Present - Beaver_Scarce	-0.0137	0.0673	6	-0.203	0.9776

Q 31. The presence of beavers make it a burden to have a wetland near your home

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3036	0.0510	6	5.950	**0.0024****
Beaver_Conflict - Beaver_Scarce	0.4688	0.0439	6	10.683	**0.0001*****
Beaver_Present - Beaver_Scarce	0.1652	0.0451	6	3.665	**0.0245***

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.2315	0.0542	6	-4.272	**0.0124***

Beaver_Conflict - Beaver_Scarce	-0.3292	0.0684	6	-4.810	**0.0071****
Beaver_Present - Beaver_Scarce	-0.0977	0.0761	6	-1.283	0.4537
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0721	0.0518	6	-1.391	0.4028
Beaver_Conflict - Beaver_Scarce	-0.1396	0.0676	6	-2.066	0.1775
Beaver_Present - Beaver_Scarce	-0.0675	0.0735	6	-0.919	0.6492

Comparing groups who answered that they had vs. had not experienced beaver conflict with question 32

Q 32. In your opinion, what best describes the extent of beaver damage in the county over the last five years?

$contrasts					
Response = Greatly_Decreased :					
contrast	estimate	SE	df	t.ratio	p.value
No_Beav_Issue - Yes_Beav_Issue	0.0314	0.0205	8	1.531	0.1642
Response = Greatly_Increased:					
contrast	estimate	SE	df	t.ratio	p.value
No_Beav_Issue - Yes_Beav_Issue	-0.2571	0.0412	8	-6.245	**0.0002*****
Response = Remained_the_Same:					
contrast	estimate	SE	df	t.ratio	p.value
No_Beav_Issue - Yes_Beav_Issue	0.3931	0.0488	8	8.056	**<.0001*****
Response = Slightly_Decreased:					
contrast	estimate	SE	df	t.ratio	p.value
No_Beav_Issue - Yes_Beav_Issue	0.0225	0.0196	8	1.145	0.2853
Response = Slightly_Increased:					
contrast	estimate	SE	df	t.ratio	p.value
No_Beav_Issue - Yes_Beav_Issue	-0.1899	0.0431	8	-4.402	**0.0023****

Wildlife acceptance capacity, analyzed by looking at question 33

Q 33. Which number below best represents your preference for the future population of beavers in the Chehalis Basin?

$contrasts
Response = 50_Percent_Less:

contrast	estimate	SE	df	t.ratio	p.value
BC_Group - BP_Group	0.3033	0.0465	12	6.521	**0.0001*** **
BC_Group - BS_Group	0.3977	0.0415	12	9.576	**<.0001*** **
BP_Group - BS_Group	0.0944	0.0376	12	2.510	***0.0659***

Response = 50_Percent_More:

contrast	estimate	SE	df	t.ratio	p.value
BC_Group - BP_Group	-0.0183	0.0351	12	-0.521	0.8624
BC_Group - BS_Group	0.0274	0.0369	12	0.742	0.7439
BP_Group - BS_Group	0.0457	0.0420	12	1.089	0.5384

Response = No_Beaver:

contrast	estimate	SE	df	t.ratio	p.value
BC_Group - BP_Group	0.0337	0.0195	12	1.726	0.2358
BC_Group - BS_Group	0.0505	0.0156	12	3.245	**0.0179***
BP_Group - BS_Group	0.0168	0.0118	12	1.426	0.3594

Response = Same_Amount:

contrast	estimate	SE	df	t.ratio	p.value
BC_Group - BP_Group	-0.1876	0.0569	12	-3.293	**0.0164***
BC_Group - BS_Group	-0.2893	0.0676	12	-4.283	**0.0028****
BP_Group - BS_Group	-0.1018	0.0733	12	-1.389	0.3767

Response = Twice_As_Many:

contrast	estimate	SE	df	t.ratio	p.value
BC_Group - BP_Group	-0.1311	0.0343	12	-3.820	**0.0064****
BC_Group - BS_Group	-0.1862	0.0520	12	-3.584	**0.0097****
BP_Group - BS_Group	-0.0551	0.0607	12	-0.908	0.6455

Socially acceptable mitigation (Q35-Q48)

Q 35. NO ACTION IF: A beaver is seen in my yard

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.2211	0.0553	6	-3.999	**0.0168***
Beaver_Conflict - Beaver_Scarce	-0.5092	0.0563	6	-9.048	**0.0003*****
Beaver_Present - Beaver_Scarce	-0.2881	0.0615	6	-4.687	**0.0080****

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.2353	0.0466	6	5.043	**0.0056****

Beaver_Conflict - Beaver_Scarce	0.2772	0.0562	6	4.932	**0.0063****
Beaver_Present - Beaver_Scarce	0.0420	0.0539	6	0.779	0.7286
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0142	0.0484	6	-0.293	0.9542
Beaver_Conflict - Beaver_Scarce	0.2320	0.0303	6	7.653	**0.0006*****
Beaver_Present - Beaver_Scarce	0.2461	0.0378	6	6.514	**0.0015****

Q 36. NO ACTION IF: A beaver floods a public road

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.09402	0.0427	6	-2.203	0.1492
Beaver_Conflict - Beaver_Scarce	-0.08791	0.0540	6	-1.627	0.3059
Beaver_Present - Beaver_Scarce	0.00611	0.0616	6	0.099	0.9946
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.22051	0.0545	6	4.047	**0.0159***
Beaver_Conflict - Beaver_Scarce	0.21319	0.0689	6	3.092	**0.0486***
Beaver_Present - Beaver_Scarce	-0.00733	0.0774	6	-0.095	0.9951
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.12650	0.0455	6	-2.781	***0.0715***
Beaver_Conflict - Beaver_Scarce	-0.12527	0.0582	6	-2.151	0.1594
Beaver_Present - Beaver_Scarce	0.00122	0.0666	6	0.018	0.9998

Q 37. NO ACTION IF: A beaver damages my private property (trees, well, etc.)

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.1520	0.0480	6	-3.170	**0.0442***
Beaver_Conflict - Beaver_Scarce	-0.1674	0.0633	6	-2.646	***0.0847***
Beaver_Present - Beaver_Scarce	-0.0154	0.0715	6	-0.216	0.9748
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3115	0.0554	6	5.626	**0.0033****
Beaver_Conflict - Beaver_Scarce	0.2852	0.0711	6	4.011	**0.0165***

Beaver_Present - Beaver_Scarce	-0.0263	0.0786	6	-0.334	0.9410	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.1595	0.0469	6	-3.398	**0.0335***	
Beaver_Conflict - Beaver_Scarce	-0.1178	0.0585	6	-2.012	0.1899	
Beaver_Present - Beaver_Scarce	0.0417	0.0676	6	0.616	0.8169	

Q 38. NO ACTION IF: A beaver carries a disease that is harmful to humans

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.1404	0.0436	6	-3.220	**0.0416***	
Beaver_Conflict - Beaver_Scarce	-0.1098	0.0540	6	-2.032	0.1854	
Beaver_Present - Beaver_Scarce	0.0306	0.0634	6	0.483	0.8819	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.2265	0.0554	6	4.090	**0.0151***	
Beaver_Conflict - Beaver_Scarce	0.2374	0.0703	6	3.376	**0.0344***	
Beaver_Present - Beaver_Scarce	0.0108	0.0785	6	0.138	0.9895	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.0862	0.0468	6	-1.839	0.2360	
Beaver_Conflict - Beaver_Scarce	-0.1276	0.0622	6	-2.052	0.1806	
Beaver_Present - Beaver_Scarce	-0.0414	0.0689	6	-0.601	0.8246	

Q 40. CONTROL WATER LEVELS IF: A beaver is seen in my yard

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.06919	0.0588	6	-1.176	0.5078	
Beaver_Conflict - Beaver_Scarce	0.04088	0.0705	6	0.580	0.8355	
Beaver_Present - Beaver_Scarce	0.11007	0.0766	6	1.436	0.3826	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.17408	0.0505	6	3.449	**0.0316***	
Beaver_Conflict - Beaver_Scarce	0.16474	0.0612	6	2.691	***0.0801***	
Beaver_Present - Beaver_Scarce	-0.00934	0.0619	6	-0.151	0.9876	

Response = Neutral:						
contrast		estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present		-0.10489	0.0547	6	-1.918	0.2138
Beaver_Conflict - Beaver_Scarce		-0.20563	0.0706	6	-2.912	***0.0607***
Beaver_Present - Beaver_Scarce		-0.10074	0.0774	6	-1.301	0.4447

Q 41. CONTROL WATER LEVELS IF: A beaver floods a public road

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.2303	0.0530	6	-4.345	**0.0115***
Beaver_Conflict - Beaver_Scarce	-0.3410	0.0570	6	-5.978	**0.0024****
Beaver_Present - Beaver_Scarce	-0.1107	0.0626	6	-1.768	0.2576
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3246	0.0409	6	7.940	**0.0005*****
Beaver_Conflict - Beaver_Scarce	0.4035	0.0321	6	12.553	**<.0001*****
Beaver_Present - Beaver_Scarce	0.0789	0.0253	6	3.125	**0.0466***
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0942	0.0418	6	-2.254	0.1397
Beaver_Conflict - Beaver_Scarce	-0.0625	0.0506	6	-1.234	0.4779
Beaver_Present - Beaver_Scarce	0.0318	0.0596	6	0.533	0.8585

Q 42. CONTROL WATER LEVELS IF: A beaver damages my private property (trees, well, etc.)

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.08183	0.0585	6	-1.399	0.3992
Beaver_Conflict - Beaver_Scarce	-0.06894	0.0724	6	-0.952	0.6308
Beaver_Present - Beaver_Scarce	0.01289	0.0774	6	0.166	0.9849
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.15793	0.0485	6	3.258	**0.0397***
Beaver_Conflict - Beaver_Scarce	0.15329	0.0584	6	2.625	***0.0871***
Beaver_Present - Beaver_Scarce	-0.00464	0.0586	6	-0.079	0.9966

Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.07611	0.0468	6	-1.626	0.3064
Beaver_Conflict - Beaver_Scarce	-0.08435	0.0597	6	-1.413	0.3930
Beaver_Present - Beaver_Scarce	-0.00825	0.0665	6	-0.124	0.9916

Q 43. CONTROL WATER LEVELS IF: A beaver carries a disease that is harmful to humans

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.15137	0.0593	6	-2.553	***0.0954***
Beaver_Conflict - Beaver_Scarce	-0.15331	0.0737	6	-2.079	0.1746
Beaver_Present - Beaver_Scarce	-0.00195	0.0790	6	-0.025	0.9997
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.17793	0.0486	6	3.660	**0.0246***
Beaver_Conflict - Beaver_Scarce	0.20328	0.0555	6	3.660	**0.0246***
Beaver_Present - Beaver_Scarce	0.02535	0.0553	6	0.458	0.8926
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.02657	0.0496	6	-0.536	0.8570
Beaver_Conflict - Beaver_Scarce	-0.04997	0.0641	6	-0.780	0.7281
Beaver_Present - Beaver_Scarce	-0.02340	0.0696	6	-0.336	0.9403

Q 45. LETHAL CONTROL IF: A beaver is seen in my yard

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3380	0.0489	6	6.909	**0.0011****
Beaver_Conflict - Beaver_Scarce	0.4214	0.0468	6	9.013	**0.0003*****
Beaver_Present - Beaver_Scarce	0.0834	0.0436	6	1.914	0.2149
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.3656	0.0560	6	-6.531	**0.0015****
Beaver_Conflict - Beaver_Scarce	-0.5093	0.0615	6	-8.282	**0.0004*****
Beaver_Present - Beaver_Scarce	-0.1437	0.0682	6	-2.106	0.1686
Response = Neutral:					

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.0276	0.0487	6	0.567	0.8420
Beaver_Conflict - Beaver_Scarce	0.0879	0.0547	6	1.607	0.3134
Beaver_Present - Beaver_Scarce	0.0603	0.0590	6	1.021	0.5917

Q46. LETHAL CONTROL IF: A beaver floods a public road

$contrasts

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.4135	0.0549	6	7.532	**0.0007*****
Beaver_Conflict - Beaver_Scarce	0.5440	0.0591	6	9.208	**0.0002*****
Beaver_Present - Beaver_Scarce	0.1305	0.0655	6	1.991	0.1951

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.3324	0.0550	6	-6.043	**0.0023****
Beaver_Conflict - Beaver_Scarce	-0.4765	0.0681	6	-6.996	**0.0010****
Beaver_Present - Beaver_Scarce	-0.1441	0.0785	6	-1.836	0.2370

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0811	0.0450	6	-1.804	0.2467
Beaver_Conflict - Beaver_Scarce	-0.0675	0.0560	6	-1.205	0.4926
Beaver_Present - Beaver_Scarce	0.0136	0.0634	6	0.214	0.9752

Q 47. LETHAL CONTROL IF: A beaver damages my private property (trees, well, etc.)

Response = Agree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3756	0.0564	6	6.657	**0.0014****
Beaver_Conflict - Beaver_Scarce	0.5735	0.0590	6	9.715	**0.0002*****
Beaver_Present - Beaver_Scarce	0.1979	0.0680	6	2.912	***0.0607***

Response = Disagree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.2954	0.0553	6	-5.343	**0.0042****
Beaver_Conflict - Beaver_Scarce	-0.5393	0.0658	6	-8.199	**0.0004*****
Beaver_Present - Beaver_Scarce	-0.2439	0.0766	6	-3.182	**0.0435***

Response = Neutral:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0802	0.0414	6	-1.937	0.2088

Beaver_Conflict - Beaver_Scarce	-0.0342	0.0475	6	-0.720	0.7615
Beaver_Present - Beaver_Scarce	0.0460	0.0558	6	0.824	0.7031

Q 48. LETHAL CONTROL IF: A beaver carries a disease that is harmful to humans

Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.2437	0.0564	6	4.318	**0.0118***
Beaver_Conflict - Beaver_Scarce	0.3782	0.0707	6	5.350	**0.0042****
Beaver_Present - Beaver_Scarce	0.1345	0.0798	6	1.685	0.2851
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.1839	0.0477	6	-3.853	**0.0197***
Beaver_Conflict - Beaver_Scarce	-0.2646	0.0658	6	-4.020	**0.0164***
Beaver_Present - Beaver_Scarce	-0.0807	0.0756	6	-1.068	0.5660
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0598	0.0442	6	-1.353	0.4203
Beaver_Conflict - Beaver_Scarce	-0.1136	0.0604	6	-1.881	0.2241
Beaver_Present - Beaver_Scarce	-0.0538	0.0666	6	-0.807	0.7128

Wildlife attitude questions (Q50-Q68)

Q 50. Having wildlife around my home is important to me

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0441	0.0411	6	-1.072	0.5638
Beaver_Conflict - Beaver_Scarce	-0.0532	0.0488	6	-1.090	0.5537
Beaver_Present - Beaver_Scarce	-0.0091	0.0511	6	-0.178	0.9828
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.0206	0.0228	6	0.903	0.6584
Beaver_Conflict - Beaver_Scarce	0.0316	0.0236	6	1.337	0.4278
Beaver_Present - Beaver_Scarce	0.0110	0.0238	6	0.462	0.8911
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.0235	0.0358	6	0.657	0.7953

Beaver_Conflict - Beaver_Scarce	0.0216	0.0440	6	0.491	0.8780	
Beaver_Present - Beaver_Scarce	-0.0019	0.0464	6	-0.041	0.9991	

Q 51. I notice birds and wildlife around me every day

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.019734	0.01922	6	-1.027	0.5885	
Beaver_Conflict - Beaver_Scarce	-0.020398	0.02268	6	-0.900	0.6602	
Beaver_Present - Beaver_Scarce	-0.000664	0.02194	6	-0.030	0.9995	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.005465	0.00545	6	1.003	0.6019	
Beaver_Conflict - Beaver_Scarce	-0.012390	0.01852	6	-0.669	0.7890	
Beaver_Present - Beaver_Scarce	-0.017855	0.01770	6	-1.009	0.5985	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.014269	0.01848	6	0.772	0.7324	
Beaver_Conflict - Beaver_Scarce	0.032788	0.01316	6	2.491	0.1033	
Beaver_Present - Beaver_Scarce	0.018518	0.01297	6	1.427	0.3864	

Q 52. I like having amphibians, such as frogs, near my home

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.2021	0.0466	6	-4.334	**0.0116***	
Beaver_Conflict - Beaver_Scarce	-0.1295	0.0627	6	-2.067	0.1773	
Beaver_Present - Beaver_Scarce	0.0726	0.0609	6	1.191	0.4999	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.0542	0.0257	6	2.109	0.1682	
Beaver_Conflict - Beaver_Scarce	0.0294	0.0359	6	0.819	0.7062	
Beaver_Present - Beaver_Scarce	-0.0249	0.0335	6	-0.741	0.7495	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.1479	0.0421	6	3.509	**0.0294***	
Beaver_Conflict - Beaver_Scarce	0.1002	0.0558	6	1.795	0.2494	

Beaver_Present - Beaver_Scarce	-0.0477	0.0538	6	-0.887	0.6674	

Q 53. I enjoy hearing frogs calling near my home

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.2353	0.0445	6	-5.284	**0.0045****	
Beaver_Conflict - Beaver_Scarce	-0.1671	0.0601	6	-2.780	***0.0716***	
Beaver_Present - Beaver_Scarce	0.0681	0.0565	6	1.207	0.4918	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.0984	0.0220	6	4.468	**0.0101***	
Beaver_Conflict - Beaver_Scarce	0.0805	0.0282	6	2.850	***0.0655***	
Beaver_Present - Beaver_Scarce	-0.0179	0.0177	6	-1.009	0.5985	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.1369	0.0418	6	3.278	**0.0387***	
Beaver_Conflict - Beaver_Scarce	0.0866	0.0562	6	1.543	0.3382	
Beaver_Present - Beaver_Scarce	-0.0503	0.0544	6	-0.923	0.6466	

Q 54. It is important for humans to manage wild animal populations

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.2309	0.0555	6	4.162	**0.0140***	
Beaver_Conflict - Beaver_Scarce	0.3230	0.0722	6	4.474	**0.0100***	
Beaver_Present - Beaver_Scarce	0.0921	0.0815	6	1.131	0.5317	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.0641	0.0371	6	-1.725	0.2718	
Beaver_Conflict - Beaver_Scarce	-0.2327	0.0633	6	-3.676	**0.0242***	
Beaver_Present - Beaver_Scarce	-0.1686	0.0687	6	-2.455	0.1081	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.1668	0.0497	6	-3.355	**0.0353***	
Beaver_Conflict - Beaver_Scarce	-0.0903	0.0591	6	-1.528	0.3440	
Beaver_Present - Beaver_Scarce	0.0765	0.0694	6	1.103	0.5468	

Q 55. If wildlife populations are not in danger of extinction, we should have the opportunity to use them to add to the quality of human life

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.1072	0.0572	6	1.873	0.2262
Beaver_Conflict - Beaver_Scarce	0.2691	0.0743	6	3.619	**0.0258***
Beaver_Present - Beaver_Scarce	0.1619	0.0814	6	1.988	0.1959
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0811	0.0406	6	-1.999	0.1933
Beaver_Conflict - Beaver_Scarce	-0.1187	0.0567	6	-2.092	0.1717
Beaver_Present - Beaver_Scarce	-0.0375	0.0638	6	-0.589	0.8311
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0261	0.0493	6	-0.529	0.8604
Beaver_Conflict - Beaver_Scarce	-0.1504	0.0697	6	-2.159	0.1578
Beaver_Present - Beaver_Scarce	-0.1243	0.0747	6	-1.664	0.2924

Q 56. Whether or not I get to see wildlife as much as I like, it is important to know it exists in the Chehalis Basin

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-1.53e-01	0.03271	6	-4.685	**0.0081****
Beaver_Conflict - Beaver_Scarce	-1.46e-01	0.03754	6	-3.895	**0.0188***
Beaver_Present - Beaver_Scarce	7.05e-03	0.02913	6	0.242	0.9684
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	2.75e-02	0.01212	6	2.267	0.1374
Beaver_Conflict - Beaver_Scarce	2.75e-02	0.01212	6	2.266	0.1377
Beaver_Present - Beaver_Scarce	-7.78e-06	0.00037	6	-0.021	0.9998
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	1.26e-01	0.03114	6	4.040	**0.0160***
Beaver_Conflict - Beaver_Scarce	1.19e-01	0.03618	6	3.283	**0.0385***

Beaver_Present - Beaver_Scarce	-7.05e-03	0.02913	6	-0.242	0.9684

Q 57. An important part of my community is the wildlife I see from time to time

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.11331	0.02824	6	-4.013	**0.0165***
Beaver_Conflict - Beaver_Scarce	-0.09676	0.03497	6	-2.767	**0.0728***
Beaver_Present - Beaver_Scarce	0.01656	0.02762	6	0.600	0.8255
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.02919	0.01698	6	1.719	0.2736
Beaver_Conflict - Beaver_Scarce	0.03846	0.01426	6	2.698	***0.0794***
Beaver_Present - Beaver_Scarce	0.00927	0.00922	6	1.005	0.6008
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.08412	0.02346	6	3.586	**0.0268***
Beaver_Conflict - Beaver_Scarce	0.05829	0.03255	6	1.791	0.2505
Beaver_Present - Beaver_Scarce	-0.02583	0.02606	6	-0.991	0.6085

Q 58. Although wildlife may have certain rights, human needs are more important than the rights of wildlife

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3158	0.0576	6	5.481	**0.0037****
Beaver_Conflict - Beaver_Scarce	0.4323	0.0646	6	6.689	**0.0013****
Beaver_Present - Beaver_Scarce	0.1166	0.0705	6	1.653	0.2965
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.2392	0.0556	6	-4.302	**0.0120***
Beaver_Conflict - Beaver_Scarce	-0.3801	0.0717	6	-5.304	**0.0044****
Beaver_Present - Beaver_Scarce	-0.1408	0.0812	6	-1.734	0.2687
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0765	0.0506	6	-1.512	0.3503
Beaver_Conflict - Beaver_Scarce	-0.0522	0.0623	6	-0.838	0.6951

Beaver_Present - Beaver_Scarce	0.0243	0.0697	6	0.348	0.9360	

Q 59. It is important to know that there are healthy populations of wildlife in the Chehalis Basin

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-7.89e-02	0.031887	6	-2.475	0.1053	
Beaver_Conflict - Beaver_Scarce	-5.55e-02	0.041780	6	-1.327	0.4322	
Beaver_Present - Beaver_Scarce	2.35e-02	0.039516	6	0.594	0.8284	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	1.64e-02	0.009385	6	1.746	0.2648	
Beaver_Conflict - Beaver_Scarce	1.64e-02	0.009388	6	1.745	0.2651	
Beaver_Present - Beaver_Scarce	-3.51e-06	0.000268	6	-0.013	0.9999	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	6.25e-02	0.030794	6	2.031	0.1855	
Beaver_Conflict - Beaver_Scarce	3.91e-02	0.040951	6	0.954	0.6292	
Beaver_Present - Beaver_Scarce	-2.35e-02	0.039516	6	-0.594	0.8284	

Q 60. The rights of wildlife are more important than the human use of wildlife

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.21465	0.0523	6	-4.103	**0.0149***	
Beaver_Conflict - Beaver_Scarce	-0.32499	0.0705	6	-4.608	**0.0087****	
Beaver_Present - Beaver_Scarce	-0.11035	0.0804	6	-1.372	0.4112	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.38011	0.0563	6	6.756	**0.0012****	
Beaver_Conflict - Beaver_Scarce	0.49554	0.0625	6	7.931	**0.0005*****	
Beaver_Present - Beaver_Scarce	0.11543	0.0687	6	1.679	0.2873	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.16547	0.0541	6	-3.061	***0.0504***	
Beaver_Conflict - Beaver_Scarce	-0.17055	0.0693	6	-2.461	0.1073	
Beaver_Present - Beaver_Scarce	-0.00508	0.0782	6	-0.065	0.9977	

Q 61. It is acceptable for human use to cause the loss of some individual wild animals if populations are not jeopardized

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.3071	0.0576	6	5.332	**0.0043****	
Beaver_Conflict - Beaver_Scarce	0.4083	0.0716	6	5.702	**0.0030****	
Beaver_Present - Beaver_Scarce	0.1012	0.0810	6	1.249	0.4703	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.1492	0.0467	6	-3.197	**0.0427***	
Beaver_Conflict - Beaver_Scarce	-0.2325	0.0659	6	-3.528	**0.0287***	
Beaver_Present - Beaver_Scarce	-0.0833	0.0750	6	-1.111	0.5422	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.1579	0.0506	6	-3.120	**0.0469***	
Beaver_Conflict - Beaver_Scarce	-0.1758	0.0663	6	-2.652	***0.0842***	
Beaver_Present - Beaver_Scarce	-0.0179	0.0756	6	-0.236	0.9699	

Q 62. Participation in regulated hunting is cruel and inhumane animals

$contrasts						
Response = Agree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.0363	0.0317	6	-1.144	0.5247	
Beaver_Conflict - Beaver_Scarce	-0.1291	0.0536	6	-2.407	0.1149	
Beaver_Present - Beaver_Scarce	-0.0929	0.0580	6	-1.601	0.3157	
Response = Disagree:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	0.1784	0.0512	6	3.482	**0.0303***	
Beaver_Conflict - Beaver_Scarce	0.3736	0.0712	6	5.247	**0.0046****	
Beaver_Present - Beaver_Scarce	0.1952	0.0805	6	2.425	0.1123	
Response = Neutral:						
contrast	estimate	SE	df	t.ratio	p.value	
Beaver_Conflict - Beaver_Present	-0.1421	0.0449	6	-3.163	**0.0445***	
Beaver_Conflict - Beaver_Scarce	-0.2445	0.0655	6	-3.735	**0.0226***	
Beaver_Present - Beaver_Scarce	-0.1024	0.0743	6	-1.377	0.4088	

Q 63. The rights of people and the rights of wildlife are equally important

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.2883	0.0567	6	-5.083	**0.0054****
Beaver_Conflict - Beaver_Scarce	-0.4303	0.0717	6	-6.006	**0.0023****
Beaver_Present - Beaver_Scarce	-0.1420	0.0817	6	-1.739	0.2671
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3331	0.0570	6	5.845	**0.0027****
Beaver_Conflict - Beaver_Scarce	0.4188	0.0649	6	6.453	**0.0016****
Beaver_Present - Beaver_Scarce	0.0857	0.0697	6	1.230	0.4798
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0447	0.0509	6	-0.879	0.6720
Beaver_Conflict - Beaver_Scarce	0.0116	0.0597	6	0.193	0.9797
Beaver_Present - Beaver_Scarce	0.0563	0.0666	6	0.845	0.6911

Q 64. Participation in regulated hunting helps people appreciate wildlife and natural processes

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.2127	0.0555	6	3.833	**0.0202***
Beaver_Conflict - Beaver_Scarce	0.3936	0.0720	6	5.467	**0.0038****
Beaver_Present - Beaver_Scarce	0.1810	0.0815	6	2.221	0.1458
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.1008	0.0401	6	-2.511	0.1006
Beaver_Conflict - Beaver_Scarce	-0.2425	0.0640	6	-3.789	**0.0212***
Beaver_Present - Beaver_Scarce	-0.1417	0.0712	6	-1.990	0.1954
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.1119	0.0475	6	-2.358	0.1223
Beaver_Conflict - Beaver_Scarce	-0.1512	0.0638	6	-2.369	0.1207
Beaver_Present - Beaver_Scarce	-0.0393	0.0720	6	-0.546	0.8523

Q 65. Humans should manage wild animal populations for the benefit of all people

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.1397	0.0589	6	2.371	0.1204
Beaver_Conflict - Beaver_Scarce	0.1988	0.0747	6	2.660	***0.0833***
Beaver_Present - Beaver_Scarce	0.0591	0.0825	6	0.716	0.7635
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0938	0.0434	6	-2.160	0.1574
Beaver_Conflict - Beaver_Scarce	-0.1790	0.0629	6	-2.847	***0.0658***
Beaver_Present - Beaver_Scarce	-0.0852	0.0703	6	-1.212	0.4892
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0459	0.0512	6	-0.896	0.6621
Beaver_Conflict - Beaver_Scarce	-0.0198	0.0623	6	-0.319	0.9461
Beaver_Present - Beaver_Scarce	0.0261	0.0690	6	0.378	0.9252

Q 66. We should ensure future generations in the Chehalis Basin will have an abundance of wildlife

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-1.13e-01	0.028580	6	-3.966	**0.0174***
Beaver_Conflict - Beaver_Scarce	-6.12e-02	0.042662	6	-1.434	0.3837
Beaver_Present - Beaver_Scarce	5.22e-02	0.036959	6	1.413	0.3930
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	5.52e-03	0.005511	6	1.003	0.6021
Beaver_Conflict - Beaver_Scarce	5.52e-03	0.005520	6	1.000	0.6035
Beaver_Present - Beaver_Scarce	-5.32e-06	0.000344	6	-0.015	0.9999
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	1.08e-01	0.028182	6	3.827	**0.0203***
Beaver_Conflict - Beaver_Scarce	5.56e-02	0.042395	6	1.312	0.4394
Beaver_Present - Beaver_Scarce	-5.22e-02	0.036958	6	-1.412	0.3930

Q 67. Participation in regulated hunting allows people to feel more self-reliant

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.1801	0.0577	6	3.124	**0.0467***
Beaver_Conflict - Beaver_Scarce	0.4810	0.0681	6	7.062	**0.0010****
Beaver_Present - Beaver_Scarce	0.3008	0.0773	6	3.891	**0.0189***
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0746	0.0420	6	-1.775	0.2555
Beaver_Conflict - Beaver_Scarce	-0.2504	0.0667	6	-3.752	**0.0221***
Beaver_Present - Beaver_Scarce	-0.1758	0.0729	6	-2.411	0.1143
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.1056	0.0499	6	-2.116	0.1667
Beaver_Conflict - Beaver_Scarce	-0.2306	0.0698	6	-3.303	**0.0376**
Beaver_Present - Beaver_Scarce	-0.1250	0.0774	6	-1.615	0.3102

Q 68. I consider myself to be a conservationist

$contrasts					
Response = Agree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.02617	0.0508	6	0.515	0.8671
Beaver_Conflict - Beaver_Scarce	-0.03158	0.0570	6	-0.554	0.8483
Beaver_Present - Beaver_Scarce	-0.05776	0.0644	6	-0.896	0.6621
Response = Disagree:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.00845	0.0258	6	-0.328	0.9430
Beaver_Conflict - Beaver_Scarce	0.03550	0.0142	6	2.493	0.1030
Beaver_Present - Beaver_Scarce	0.04395	0.0215	6	2.045	0.1823
Response = Neutral:					
contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.01772	0.0461	6	-0.384	0.9228
Beaver_Conflict - Beaver_Scarce	-0.00392	0.0557	6	-0.070	0.9973
Beaver_Present - Beaver_Scarce	0.01381	0.0620	6	0.223	0.9731

Q 69-72. N/A

Q 73. Do you own or rent the residence that you currently live in?

$contrasts

Response = Other:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.00719	0.01641	6	-0.438	0.9012
Beaver_Conflict - Beaver_Scarce	0.00751	0.00751	6	1.000	0.6034
Beaver_Present - Beaver_Scarce	0.01470	0.01461	6	1.006	0.6000

Response = Own:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.09155	0.04213	6	-2.173	0.1549
Beaver_Conflict - Beaver_Scarce	-0.15036	0.03100	6	-4.850	**0.0068****
Beaver_Present - Beaver_Scarce	-0.05881	0.02854	6	-2.061	0.1787

Response = Rent:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.09874	0.03925	6	2.516	0.1001
Beaver_Conflict - Beaver_Scarce	0.14285	0.03034	6	4.708	**0.0079****
Beaver_Present - Beaver_Scarce	0.04411	0.02491	6	1.771	0.2567

Q 74. What is your highest formal education level?

$contrasts

Response = Associate's Degree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0476	0.1011	12	-0.471	0.8860
Beaver_Conflict - Beaver_Scarce	-0.0953	0.1205	12	-0.790	0.7157
Beaver_Present - Beaver_Scarce	-0.0476	0.1405	12	-0.339	0.9389

Response = Bachelor's Degree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0159	0.1255	12	-0.127	0.9912
Beaver_Conflict - Beaver_Scarce	0.1191	0.1155	12	1.030	0.5728
Beaver_Present - Beaver_Scarce	0.1349	0.1410	12	0.957	0.6166

Response = Graduate or Professional Degree:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.1825	0.1149	12	-1.589	0.2876
Beaver_Conflict - Beaver_Scarce	-0.1190	0.1186	12	-1.003	0.5888
Beaver_Present - Beaver_Scarce	0.0635	0.1522	12	0.417	0.9092

Response = High School/GED:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0714	0.0988	12	-0.723	0.7551
Beaver_Conflict - Beaver_Scarce	-0.0476	0.1039	12	-0.458	0.8917
Beaver_Present - Beaver_Scarce	0.0238	0.1283	12	0.186	0.9812

Response = Some College:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.3175	0.1064	12	2.984	**0.0285***
Beaver_Conflict - Beaver_Scarce	0.1429	0.1429	12	1.000	0.5908
Beaver_Present - Beaver_Scarce	-0.1746	0.1416	12	-1.233	0.4576

Q 75. What is your gender identity?

$contrasts

Response = Do not identify as male, female, or transgender:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	1.47e-05	0.000559	9	0.026	0.9996
Beaver_Conflict - Beaver_Scarce	-7.13e-02	0.068779	9	-1.037	0.5739
Beaver_Present - Beaver_Scarce	-7.13e-02	0.068777	9	-1.037	0.5738

Response = Female:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-3.77e-01	0.117590	9	-3.202	**0.0264***
Beaver_Conflict - Beaver_Scarce	-1.81e-01	0.149935	9	-1.206	0.4790
Beaver_Present - Beaver_Scarce	1.96e-01	0.164502	9	1.190	0.4879

Response = Male:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	3.55e-01	0.118243	9	3.005	**0.0359***

Beaver_Conflict - Beaver_Scarce 2.31e-01 0.149233 9 1.548 0.3157

Beaver_Present - Beaver_Scarce -1.24e-01 0.163392 9 -0.761 0.7349

Response = Prefer not to answer:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present 2.13e-02 0.021042 9 1.010 0.5890

Beaver_Conflict - Beaver_Scarce 2.12e-02 0.021147 9 1.003 0.5937

Beaver_Present - Beaver_Scarce -6.21e-05 0.002106 9 -0.029 0.9995

Q 76. What is your age?

$contrasts

Response = 18-25:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.0565 0.0533 21 -1.060 0.5484

Beaver_Conflict - Beaver_Scarce 0.0175 0.0174 21 1.009 0.5796

Beaver_Present - Beaver_Scarce 0.0741 0.0504 21 1.470 0.3252

Response = 26-35:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present 0.1384 0.0621 21 2.228 ***0.0895***

Beaver_Conflict - Beaver_Scarce 0.1754 0.0504 21 3.482 **0.0060****

Beaver_Present - Beaver_Scarce 0.0370 0.0363 21 1.019 0.5733

Response = 36-45:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present 0.0624 0.0871 21 0.716 0.7568

Beaver_Conflict - Beaver_Scarce 0.0567 0.1137 21 0.499 0.8728

Beaver_Present - Beaver_Scarce -0.0057 0.1212 21 -0.047 0.9988

Response = 46-55:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present 0.1170 0.0821 21 1.424 0.3471

Beaver_Conflict - Beaver_Scarce 0.1511 0.0925 21 1.635 0.2537

Beaver_Present - Beaver_Scarce 0.0342 0.0955 21 0.358 0.9320

Response = 56-65:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.0292	0.0760	21	0.385	0.9219
Beaver_Conflict - Beaver_Scarce	0.0634	0.0871	21	0.729	0.7495
Beaver_Present - Beaver_Scarce	0.0342	0.0955	21	0.358	0.9320

Response = 66-75:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.3041	0.1061	21	-2.866	**0.0241***
Beaver_Conflict - Beaver_Scarce	-0.3212	0.1457	21	-2.204	***0.0937***
Beaver_Present - Beaver_Scarce	-0.0171	0.1681	21	-0.102	0.9943

Response = Over 75:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.0390	0.0560	21	-0.696	0.7681
Beaver_Conflict - Beaver_Scarce	-0.1957	0.1194	21	-1.639	0.2518
Beaver_Present - Beaver_Scarce	-0.1567	0.1273	21	-1.231	0.4485

Response = Prefer not to answer:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.0526	0.0296	21	1.780	0.2007
Beaver_Conflict - Beaver_Scarce	0.0526	0.0296	21	1.780	0.2007
Beaver_Present - Beaver_Scarce	0.0000	0.0000	21	-1.556	0.2862

Q 77. What is your race?

$contrasts

Response = American Indian or Alaska Native:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	0.06383	0.0357	21	1.790	0.1972
Beaver_Conflict - Beaver_Scarce	0.00132	0.0702	21	0.019	0.9998
Beaver_Present - Beaver_Scarce	-0.06250	0.0605	21	-1.033	0.5650

Response = Hispanic, Latino, or Spanish:

contrast	estimate	SE	df	t.ratio	p.value

Beaver_Conflict - Beaver_Present 0.02128 0.0211 21 1.011 0.5783

Beaver_Conflict - Beaver_Scarce -0.04122 0.0641 21 -0.643 0.7981

Beaver_Present - Beaver_Scarce -0.06250 0.0605 21 -1.033 0.5650

Response = I prefer not to answer:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present 0.09195 0.0600 21 1.533 0.2965

Beaver_Conflict - Beaver_Scarce 0.06516 0.0777 21 0.839 0.6835

Beaver_Present - Beaver_Scarce -0.02679 0.0699 21 -0.383 0.9226

Response = Other:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present 0.04940 0.0537 21 0.919 0.6343

Beaver_Conflict - Beaver_Scarce 0.08511 0.0407 21 2.091 0.1159

Beaver_Present - Beaver_Scarce 0.03571 0.0351 21 1.018 0.5738

Response = White:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.11930 0.0984 21 -1.212 0.4594

Beaver_Conflict - Beaver_Scarce -0.11037 0.1182 21 -0.934 0.6255

Beaver_Present - Beaver_Scarce 0.00893 0.1215 21 0.074 0.9970

Response = White; American Indian or Alaska Native:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.03572 0.0351 21 -1.018 0.5738

Beaver_Conflict - Beaver_Scarce 0.00000 0.0000 21 1.660 0.2437

Beaver_Present - Beaver_Scarce 0.03572 0.0351 21 1.018 0.5738

Response = White; American Indian or Alaska Native; Native Hawaiian or Other Pacific Islander:

contrast estimate SE df t.ratio p.value

Beaver_Conflict - Beaver_Present -0.03572 0.0351 21 -1.018 0.5738

Beaver_Conflict - Beaver_Scarce 0.00000 0.0000 21 1.660 0.2437

Beaver_Present - Beaver_Scarce 0.03572 0.0351 21 1.018 0.5738

Response = White; Native Hawaiian or Other Pacific Islander:

contrast	estimate	SE	df	t.ratio	p.value
Beaver_Conflict - Beaver_Present	-0.03572	0.0351	21	-1.018	0.5738
Beaver_Conflict - Beaver_Scarce	0.00000	0.0000	21	1.660	0.2437
Beaver_Present - Beaver_Scarce	0.03572	0.0351	21	1.018	0.5738