

## QUESTIONS FOR WEBINAR:

### Using Wildlife Fright Distances to Inform Trail Planning

July 1, 2021

**Alicia asks:** Do you have any info on desert areas? I'm sure all still applies

**Lori answered:** The same applies to desert areas.

**Andrea asks:** Habituation is one possible result of frequent disturbance. What are other effects such as permanently vacating the habitat?

**Lori answered:** The opposite of habituation is sensitization, and that happens in some cases. Sensitized animals may switch their activities to night time, with unknown consequences, or leave the site entirely, which essentially removes that habitat for that animal. Many animals, like in the Colorado deer/small mammal study, will move back from the trail some distance to avoid people – that's the zone of avoidance. That's a really good example of behavioral fragmentation: a trail is a linear feature, so that avoidance of the trail zone essentially severs the habitat for some species, especially on busy trails. Large carnivores such as cougar are probably the first ones to leave a site when disturbance is introduced.

**Anna asks:** Can you touch on the methodology that was used by researchers to determine fright distances?

**Lori answered:** There are a number of different ways people have done it depending on the habitat. Sometimes animals are radio tagged as mentioned previously. Sometimes it is two researchers and one will be stepping back watching what happens. Sometimes it is two researchers, and one will stay back to estimate the fright distances while the other approaches the animal. A flock of shorebirds, they can select one shorebird to watch, and let the person walk closer and closer and up the point that animal flies, that's your fright distance. That is generally how it is measured, the person watching, they watch where things happen and figure out how to do that fright distance estimate. That's a common way of doing it.

**Ashley asks:** Hi Lori, would you by chance have a summary of your distance findings and the associated literature that you could share with the group?

**Lori answered:** The section on fright distances starts on page 90 in my review; page 92 shows the data graphically. Those numbers will change a bit in the upcoming publication because I located additional research. You can find a one-page summary of general wildlife issues on page 71 here: <https://www.oregonmetro.gov/sites/default/files/2017/09/28/Metro-Recreation-Ecology-Literature-Review.pdf>. Table 8 (pages 93-94) in the same documents offers some potential ways to reduce effects. An entire article could be written about that.

**Barbara asks:** I thought that trails (in forests) would create edge zones that would attract wildlife. No-ish?

**Lori answered:** That's interesting. Edges are complicated, kind of like habituation, not everything is what it seems. If you put a trail through a forest you change the microclimate - the area in and around the trail where there is more light coming through. In recreational settings it tends to favor invasive species that people bring in on feet, hooves, or tires. Pretty much all recreational users introduce weed seeds. So the wildlife attraction thing, in the old world of wildlife biologists when there were way fewer people,

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we used to think that edge habitat was good; it can be good because sometimes it is a meeting of two habitat types with species from each while that may be true for deer, elk and other animals in a more undisturbed setting, once we introduce human disturbance edge habitats start to become negative due to invasive species, human disturbance and habitat fragmentation.

I think that I am confused at fright distance: how close that you can get to them before they flee? So, short FID means that you can get closer before they flee, & longer FID means that they will run when you are even farther away, correct? (Sorry, I keep mixing the distance)

**Lori answered:** It confused me at first. Alert distance is when they first notice you. That tends to be longer than when they run away from you. Alert distance, here is your deer looking at you, here is you. For flight initiation distance, you are coming closer and closer and whoops, they will fly away. That's flight initiation distance. The flight initiation is when they flee. For that reason alert distance tends to be longer than flight initiation distance. They look up, then they flee.

**With regard to trail creation: what is the impact of Rails-to-Trails conversions to an active trail?**

**Lori answered:** I suppose it would depend first on whether it is a busy trail or not. I guess if it's been abandoned for a while, you are already going to have your habitat disturbed there but maybe not the wildlife. What you are really introducing is the human disturbance. What will happen over time is, at first, the animals that are most scared of people will switch to night or else move off of the site. Then it will start to sort out the animals that can habituate more, and those that need to move away from you, and the ones that habituate get shorter and shorter fright distances to a point. That's a tendency for the generalist species.

Bill asks: Are there any studies in your findings on the impacts of ATVs, OHVs? (studies OR your findings)

**Lori answered:** I ran across a number of studies and they are super disturbing to wildlife, I think they beat the dog effect.

**Christopher asks:** I apologize if this has already been discussed, but I joined the webinar late. What incursions were used to trigger fright responses? Hikers, bikers, equestrians, motorized? Where triggering acts standardized? The one study measured duration of triggers (number of hikers over time) but was that trigger protocol consistent between studies? Were fright reactions affected by ambient conditions (aircraft, thunder/lightning, sound vs. visual, etc.)?

**Lori answered:** I considered hikers, mountain bikers and equestrians. Study methods really varied, and some studies were more robust than others. However, a measure like the number of people per hour on a trail is pretty straightforward. One issue is that there are few before-and-after studies so you often don't know what you've already lost. There are also very few long-term studies, and those are real limitations. For example, you may get really different information if you study fright distances when recreation is first introduced to an area vs. five years later, when animals have either become habituated or sensitized and left the site or moved to undisturbed areas. Yes, I believe I did see a few studies considering ambient noise; basically, for the animals that stay, if the disturbance is regular then they will be able to habituate to some degree. There is a gravel quarry next to a natural area near my house; it's usually pretty quiet there but some animals set up shop near the quarry. Side note: I've seen

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several studies in which some songbirds change the pitch of their songs near noisy roads, probably so they could hear one another. I believe I saw one on frogs with similar findings a while back as well.

**Colin asks:** Really appreciate the great summarization of current research. One topic we have often discussed with our own ecologists on this topic is the positive publication bias, and the general unwillingness of researchers to publish studies that do not find statistically significant effects. Do you have any sense from your review of how influential the positive publication bias might be in this realm?

**Lori answered:** That's interesting. I don't, and that can be very valuable information. I can tell you that if I found an exception in a trend, I stated so in the literature review. The consistency in trends is quite strong in many cases, including in meta-analysis type literature reviews. It can be more difficult to publish results that don't prove anything; it may not make it through the peer review process. Often folks don't realize that finding no significant effect is still an important finding. I admit that I came into this review with my own bias and was surprised that mountain biking effects don't seem to be much harder on trail systems than hikers. After talking with some federal land managers I suspect off-trail effects may be a different matter, but haven't seen any proof.

**Elizabeth asks:** What a great topic! I'd like to hear more about effective signage and messaging to keep people ON trails and/or keeping their dogs on leash, good behaviors, etc. Any more you can add to this?

**Lori answered:** While I did not take a deep dive into this topic, you can find more information starting on page 97 in the literature review.

<https://www.oregonmetro.gov/sites/default/files/2017/09/28/Metro-Recreation-Ecology-Literature-Review.pdf>. Metro is changing some of our signage now that we know this.

Any research about the impacts of races and other events that might happen on trails... usually a ton of people for a short period of time. Anything race organizers should keep in mind to reduce impact on wildlife?

**Lori answered:** I did not focus on that information. It is not part of my study. Ran across a number of references about that. The literature is out there and some were specifically asking about trail damage. I don't think there's much other information on wildlife effects from short term, intense events. People don't tend to study that sort of thing because we are siloed. Folks planning events are not wildlife biologists and that's why we are talking today.

**Jonathon asks:** Your review is very helpful. I have been involved in research with wildlife flight initial (FID) distance with wildlife and approaching vehicles. I currently am monitoring activity on various types of trails in a large urban park system. We have seen distinct temporal avoidance of human activity but have not finished our monitoring yet to be able to publish the results. In the meantime questions have come up about nighttime mountain biking. Do you have any supporting information about the effects of nighttime riding?

**Lori answered:** I would assume there are, I think I saw a study on that but it did not include in my work because that's not what I was looking at. There is some question about whether wildlife can see them coming at night. I can't say for sure what would influence, but if I would have to guess, it would be more disturbing at night especially because a lot of animals that are sensitive switch to nighttime activities.

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**Joshua asks:** Have any studies been done that examine whether fright distances reduce over time for a particular subject?

**Lori answered:** Yes, that habituation thing happens commonly in some species or with those bold individuals who are able to habituate. That's the typical response: for animals that stay, the fright distance will become shorter over time as an animal gets used to your disturbance and they're not as frightened by you.

**Lil asks:** Are there studies about paved vs natural surface trails and ability of smaller animals to cross a trail?

**Lori answered:** I have not found anything like that. I found something that was interesting about snakes. Snakes don't like to cross gravel very much. Must be hard on their scaly bellies. Something to keep in mind as we build trails. If you have an area that is full of snakes, and I'm not necessarily advocating for this, paved surfaces might be easier for certain animals to get across the pavement. That could also be true for amphibians. Not that it makes paved versus unpaved better or worse, but it is a difference.

**Margo asks:** Any research on butterflies and trail disturbances? Especially in regard to mating and egg laying.

**Lori answered:** I did not find details on mating and egg laying but I ran across a study they did on fright distances for butterflies. Check this one out:

[https://www.researchgate.net/publication/329120445\\_Flight\\_initiation\\_distance\\_in\\_Lepidoptera\\_ns\\_is\\_species-specific\\_and\\_positively\\_related\\_to\\_starting\\_distance](https://www.researchgate.net/publication/329120445_Flight_initiation_distance_in_Lepidoptera_ns_is_species-specific_and_positively_related_to_starting_distance). I think I also saw one on dragonflies.

**Mike asks:** Lori mentioned that dogs are not allowed in the regional parks. How does her agency handle guide dogs? Does this mean that persons who are blind can only use the parks with a cane and not their service animals?

**Lori answered:** I should have noted the exceptions to this rule. There are two for Metro's parks: service animals, and in cases where a regional trail crosses through a Metro property. Dogs on leash are generally allowed on regional trails.

**Rachel asks:** RE Dose-dependent response: Would it be better to distribute users broadly and create lower dose across landscape or focus use in some areas to create higher dose in some areas and low/no dose preserved in other areas?

**Lori answered:** That's a good question. We can go either direction. My personal opinion, it would be better to have a few busy trail than a lot of non-busy trails. It has to do with the area of the extent of disturbance in the fragmentation information we looked at.

**Ralph asks:** How does motorize fit into this?

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**Lori answered:** I ran across a number of studies and they are super disturbing to wildlife, I think they beat the dog effect.

**Sam asks:** Are there guidelines on use of fright distances for siting buildings?

**Lori answered:** We could certainly use it. If it is a really busy, often times we might want to consider longer fright distances. Certainly you could use this information to take your best guess – if you know there's going to be a ton of people, we want to make your protected distance longer.

**Steve asks:** Trail alignment in a corridor should avoid the middle of the corridor. To lessen impact on wildlife position trail at edge of corridor. Is this the better approach?

**Lori answered:** Yes it is. The reason is that it's a disturbance factor, and maybe the vegetation factor as well. Think of it like a stream, we don't want to run a trail right along the edge of a stream. One integrated stream areas. Stream areas are great areas for wildlife because they have a lot of vegetation. It's like a stream, you are in the middle of the corridor if you are a deer and will get disturbance on each side. If people were on the edge of the patch, you would be not be disturbed or you'd be less disturbed.

**Vernon asks:** Do you have any data on how tolerant Spotted Owls are to humans?

**Lori answered:** As a biologist, I can tell you spotted owls are amazingly tame animals. I did find one study on Mexican spotted owls but nothing else. Trying to recall if I am right, I think in this case the animal might have become sensitized overtime, that when biologists and researchers study spotted owls, they can call owls right to the mouse in their hand and they will take the mouse. You have to be careful about what that says about fright distances based on just one study. I found one study and that citation is in the literature review.

**Yaniro asks:** What is the name your dog?

**Lori answered:** Excellent question. His name is Gudas. He's named after Radko Gudas, an "enforcer" (a.k.a. goon) who used to be with the Philadelphia Flyers, my favorite ice hockey team. Alas, Radko Gudas went to another team shortly after we named our dog. He is a "red fox" lab and weighs 100 pounds! Unexpectedly huge critter who does not understand how big he is and still thinks he's a lap dog. He knocks stuff off of the coffee table with his tail all the time and whacks our legs, too.