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Thank you for being our feature researcher for this issue! To start us off, tell us a little bit about yourself! What is your background in research, and what are your current research projects or interests?

Well first I'll say, what an honour it is to be chosen as your feature researcher! Thank you for your interest in my past and in my research. Here's a little thumbnail sketch of me: I grew up in Edmonton, did a BSc in Zoology here at the U of A, went away for graduate work for about 10 years, and came back here as a professor in Biological Sciences, where I've been for about 25 years. As an undergrad, I grew an interest in research partly because of a quirky fascination with penguins. After graduating, I planned a year to go off and volunteer on penguin research projects, but that turned in to a master's degree. I really got hooked on the particular question I was studying, so that became a PhD, still on penguins. I did my master's in New Zealand and then went to the University of Oklahoma for my PhD, where there was an expert in the reproductive strategy that I was studying. From there I came back to the University of Alberta as a Killam post-doc and began studying how birds move through landscapes that have been fragmented by human activity.

In that era, I shifted away from basic studies of animal behaviour, which was the focus of my graduate work, to applied problems in conservation biology. I was attracted to conservation biology because it was a new field that seemed pretty urgent and important. With my students, I studied the problem of how animals move through fragmented landscapes in several species - birds as well as mice, voles,

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weasels, and wolves, and in landscapes that included tropical agriculture, mountain parks, and industrial forestry. I learned very quickly that most species are quite good at navigating human landscapes. But if they manage

to do that and they are large, like say elk-sized, or a carnivore, like a bear, then another problem soon follows - human-wildlife conflict. I've studied this issue by using animal behaviour to understand both the sources of conflict and the solutions for co-existence.

Getting started in research can be a very difficult and intimidating process. We'd like to know about what your experiences were getting started in research and some challenges that you might have faced. Take us back to your time as an undergraduate student - was research already on your mind as a career? What influenced your decision to pursue a research career, and were there any challenges that you faced getting started in research as an undergraduate student?

Well, as recently as the start of grade 12, I planned to be a classical bassoonist... but I chickened out of that thinking: ah, I don't really want a life of performance anxiety and what if I never get a job? So I went to the high school career counselor, took some aptitude tests, and soon I found

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myself in the pre-professional program for occupational therapy, one of the rehab medicine programs. And I hated it! I actually started missing class and, instead, rode my bike around in the river valley, wondering what I was going to do with my life. I realized that I really liked being outside, and biology classes were my favourite. I discovered that there are actually jobs that involve watching and studying wild animals outdoors. That was my Eureka! I wouldn't say that I decided one day: "oh, I'm going to be an animal behaviour researcher!" It was more like I just kept gravitating towards the things I was enjoying and trusting myself, I guess, that it would work out somehow.

I want to admit another thing. During my undergraduate degree I was more and more drawn to research environments not only because of research-related things like finding particular information that I thought was fascinating, but also because of the culture I witnessed. I made friends in those biology classes that had similar interests, inside and outside school. We all took a couple of discussion classes in our final year in which we read scientific papers and discussed them... I loved doing that. We would sometimes meet up in a little room, more of a closet actually, that we were allowed to use to study. It was such an enjoyable thing to be building a group of friends while refining our interests. I still wasn't thinking about a career exactly, but I was learning more about what kinds of careers coincided with interests in ecology, animal behaviour and conservation biology. Several friends from that era are biologists we still keep in touch. I think the shared experience that invited me in a research direction was partly scholastic, but the culture was equally important.

I had some other experiences that were also formative. For a couple of summers I worked as a research assistant for graduate students in Kananaskis Country on projects involving ground-squirrels and snails. There too, I just really enjoyed the lifestyle of being a field biologist living in somewhat remote places, in somewhat primitive conditions [chuckles]. For some reason primitive conditions are really appealing to me; I still like that simplicity of life, while being outside hiking around and watching animals while trying to figure out why they do what they do. It's true that I also took chances and worked hard in the years that followed, but I believe the kind of path I took can still work. I encourage students to allow themselves time to discover how to integrate what they enjoy with the kinds of jobs that exist, and to work hard, retain flexibility, and enjoy the journey.

Have your motivations to do science changed since your time as an undergraduate researcher? Has the balance between your curiosity for science and interest in pursuing research changed from the time you were an undergraduate student to now?

Yeah, I think it has. I like to think that I've become a little bit more outward looking. I've admitted that my early interest in research really stemmed from the fact that I was having fun, and gradually it shifted from studying things that I found fun and interesting to studying things that could improve the plight of wild animals and improve the opportunities for people and wildlife to coexist. My students and I have worked on coexistence with deer, elk, bears, cougars, coyotes; even tigers and elephants. As human populations grow and secure habitat for other

species shrinks, it's ever more important to increase opportunities for coexistence.

More recently, I think I've had another

transition to wanting to engage more people in the process as well as the products of science, seeing it as more of a public enterprise than I once did. I believe that it's actually very important, especially at a publicly funded university like ours, to study things that other people find interesting and important, and to do that in a way that's transparent as well as rigorous, but also genuinely engaging. For this reason, I really like doing collaborative research projects that invite or respond to invitations from people in government, industry, non-profit conservation groups, and members of the public - I've worked with all those types of groups.

When it comes to trying to answer some questions that matter to these groups, I especially like working on things that interest a broader public. For example, I study urban coyotes partly because they attract so much attention from people of so many types. Many people are just fascinated by coyotes - they enjoy watching them, as do I. They enjoy running into them when they're on a walk in the ravine, as

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do I. But, even these same people might also be quite fearful for their pets, maybe even for their children. They might be interested in what kind of policy a city should have about managing coyotes, where to find the balances, and so on. In my research I'm also genuinely interested in the opinions and expertise of other people. And they've come from all

walks of life; expertise is not restricted to other academics or other biologists. So I guess I would say it is both humbling and a privilege to do research that invites the interest and expertise of such a breadth of people.

Are there any challenges that you've encountered while working with industry, community, or government?

Ohhh yes. There's been plenty of challenges working with industry in particular. There's always a profit margin and a fiduciary responsibility by a publicly traded company, like the ones I've worked with. They are required to maximize their profits and avoid expenditures on unnecessary things. That isn't always well aligned with the priorities I might have as an individual, but that makes it extra fulfilling when we do find common ground. I separate the processes of presenting and interpreting biological evidence from making management recommendations and try to be very transparent about my logic.

Another challenge comes from working with members of the public where I often encounter really dichotomous, black-and-white thinking. I had an experience a few years ago where I gave a presentation at the request of a

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community league to a few dozen people about urban coyotes. After the presentation, discussion about coyote management became quite heated with some people feeling that coyotes didn't belong in their communities and others valuing them. So I asked, just as a show of hands, how many people thought coyotes should be killed when they occurred in residential neighbourhoods and how many people found that kind of management to be unacceptable. About half the audience raised their hand for each of those options. I think people were surprised at how most people had one of those two views, and then might have had a moment of discomfort realizing that the person sitting next to them with the opposite view, was their next-door neighbour. I think this brought a little bit of awareness to the challenge that wildlife managers face when they have to come up with policy that is acceptable to all when there is such a diversity of opinions. But this challenge also helps to keep me honest in the way I approach research and the

things I study, as well as the way I try to offer recommendations to decide what might be done with the products of research. It's important to realize that people come with a whole variety of not just values, but also responsibilities, sources of accountability, and experiences that generate a sense of right and wrong that they feel very passionately, but might be different from my sense or the senses offered by other people that are in the discussion.

That's a really interesting point you make about the dichotomous view that the public often has. This is something that we've definitely all seen, especially with discussions related to COVID-19. It is very hard for researchers to get their message out there since the people's opinions are so divided on subjects and that can influence their perception of the science significantly. But as you mentioned, this division is not exclusive to COVID-19 - it's also present in a lot of other issues/topics as well, and it's a general issue that scientists from all fields face when trying to transfer their knowledge to the public. Our next question to you is actually related to that: do you think academia does a good job of transferring knowledge to the public? What are some ways that you think this transfer of knowledge could maybe be improved?

I think we have historically done a poor job of that kind of knowledge transfer. I think we're improving, and I believe it's partly because all of society is moving beyond the concept of knowledge transfer, or knowledge mobilization as the federal government likes to call it, to something closer to the co-generation of knowledge. I really like that transition for the reasons I was explaining earlier, even though it's really challenging in some disciplines, like neurobiology for example, where it is really difficult to cogenerate knowledge of such a specialized sort. I have the luxury of working on a topic (human-wildlife conflict) where there is genuine expertise from the experiences of

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people that do other things entirely for a living. And I think the bigger impediments to being able to achieve that kind of collaboration and sharing of knowledge are kind of

traditional ones - you know, the traditional reward structure of universities doesn't really favor that view. The traditional venues for sharing that information don't necessarily support collaboration with the public to co-

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generate knowledge, but it's changing really rapidly and this is such an exciting era!

There's been a lot of great papers published with citizen science, and more really nice papers summarizing how diverse and extensive the bodies of research are that stem from various kinds of citizen science. I don't mean to say that this approach applies to every kind of research question, but I'm really pleased that it is applying to more and more types of questions, and also that the whole process of science is under a little bit of a revolution to become more transparent and open. I guess open science has come to mean a lot more than just open-publication, where there is open access to reading the peer-reviewed literature, to also meaning that there is accessibility for people to know what it is that scientists even proposed to study, increased availability of the data that they generate, and more transparency of the analytical approaches that they use to treat those data. Every step of the scientific process is becoming more open, and I think that's a great thing.

I'm going to kind of transition back a little bit to something that you were mentioned earlier - that your approach to science has changed in that now you are also focused on improving other's experience with science, in kind of a mentorship type way. You've actually been recognized for your mentorship abilities - what is your approach to mentorship, especially when working with students that have a wide variety of goals and research interests?

Thank you, first of all, for acknowledging that recognition. I was really pleased and humbled by that, because I guess my view of mentoring is that I learn as much as I lend when I'm interacting with students or other mentees. It is very much a two-way street. But of course, I am in a position where I have a responsibility to help students grow as scientists and

often that also means helping them grow as people. I try to do that in a way that suits each person's individual nature and adapt my own approach a little bit to suit each individual; reasoning that I'm the one with more years of experience and more capacity for that kind of adaptation - or I should be at least.

Nonetheless, it's challenging because part of being a mentor is to push people to do things that they don't feel comfortable doing or they haven't done before. Often, it is to help them realize that they have more agency and control over a situation or their progress than they are believing themselves to have - that's an uncomfortable realization for all of us. Sometimes, this involves pushing people to realize that they have to be more accountable, particularly because I work on things in the public interest, with public funds, or funds from other organizations that are interested in the products of the research in a timely way. I feel a lot of responsibility to meet those obligations, and when I'm working on those things with students I necessarily impose that responsibility on them too. Sometimes, students aren't really ready for that kind of accountability. That's one of the difficult parts of mentoring, I would say. But it's more than outweighed by the really satisfying parts of mentoring. I do learn a lot from my students and thoroughly enjoy working with such a diversity of people. It is really fulfilling to see people grow in their skills, confidence, and awareness of the world, and in their own realization of what they want to do with their future. That's pretty nice stuff to witness.

Have you had any experiences with mentors in the

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past that have influenced the way that you approached mentorship? Or has your approach to mentorship mostly been shaped by your experiences with the students you have mentored?

You know, I think it's a mix of those two things. Maybe one of the things that really contributes to my approach to mentoring is the number of mistakes I've made! And

importantly, the compassion and support I've received in those moments from both mentors and mentees. I think of one mistake in particular, when I was a PhD student, and I failed to back up data about bird behaviour for an entire morning. When my supervisor tripped on the power cord entering the blind we used to watch the birds, we lost all of that data. With it went an entire replicate for a 2-day experiment that had involved injecting doubly-labeled water into a family of wild birds, so a very big loss of data, expense, and opportunity. I felt sick at such a stupid oversight, but my supervisor looked at me in kind of stunned disbelief, followed by a calmness. Then he then told me about a time he had made a really stupid error while he was a PhD student and his supervisor had been surprisingly forgiving about it, and then had told him that he would have an opportunity to pay this back to somebody someday. "I just had that opportunity!" is what my supervisor then said to me. So I try to remember that at comparable moments with my own students. I've continued to make mistakes of course, and my students witness that all the time. One of the reasons I like to spend time in the field with them is because I think it helps me to give more realistic advice. Of course, I've also witnessed their mistakes. We're all walking towards the person we'd like to be and none of us ever quite arrive. Our daily behaviour is never exactly like we would like it to be. I try to always remember that and always believe in the good intentions of every individual. I tell my students: no matter what I say to you, no matter how frustrated I might feel in a moment, I'm always in your corner, I'll always will want what's best for you and I'll never stop trying to help you achieve that.

As a student myself, it is great to hear that this is the approach that you are coming from. I think that students want to hear that their professors are there for them, as it is sometimes difficult to understand that the pressure and expectations are there to help you and push you further, and not to put you down.

I have a quick little follow-up on that one. When students take the time to contact me after they finish our time working together, more often than not it comes with a message about how "what you made me do was so hard at

the time, but, it's so helpful now." I've heard this from undergraduate students as well as graduate students, and had two students contact me just this term to communicate that. So, I think that one of the most difficult yet satisfying things about being a mentor is that you get to help people face things they don't necessarily want to face because it is difficult for them at the moment. When they do face them successfully and grow from it, they realize how helpful it was and they appreciate it deeply. Sometimes they communicate that which is very satisfying.

What qualities do you think make a student a good mentee, or help them get along with you as their mentor?

Hmmm, well, I would say two things are more important than all the others, even though many things are important. The two qualities that I value most are initiative and persistence. I find that most students have enough capability to do research. Of course, it's easier to do research if you are a very capable student; you know, already quite adept at using the literature and learn easily, have a good memory, all of those conventional correlates of a GPA. I

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think the reason that a high GPA is meaningful is not because it indicates high intelligence, it is primarily because it indicates the ability to take responsibility and

initiative for learning things, and then persisting to learn and complete them. The capacity to overcome frustration, which is what keeps us from starting things and more often keeps us from finishing them, is really essential for research. There are a lot of moments in research, even in really fun research working with big, glorious animals outside, that are just boring, or hard, or frustrating, or too cold, or too hot, or too dark, or any number of things that make it feel like it isn't possible to do what you're trying to do. Meeting these challenges and figuring out a way to do it anyway is what makes the difference. So that's why I value initiative and persistence. They're hard to measure - it's not like you can do a behaviour test when people first propose doing a project together. But returning to GPA, I think that's the reason that supervisors in general pay attention to it - it's an honest indicator. The only way you can have a high GPA is to overcome the frustration that comes when you meet a course that you don't find interesting, or an instructor that you find ineffectual, or there is a collision

between your personal life and your school life that seems intractable. You can't get through those things unless you have those core tendencies of initiatives and persistence.

What advice would you give to undergraduate students who are thinking about getting started in research, or those who are deciding whether they should continue in research?

If you think you might like it, try it! Don't worry about the distant future, just try one thing a time; volunteer with a graduate student, apply for a summer job as a research assistant, take an undergraduate project course. Pay attention to what parts you like and don't like. Be prepared to work to overcome your rate-limiting characteristics, but don't aim to change your values or personality. Explore your aptitudes, but don't fall for that old ruse that you can find something you love and never work a day of your life. Even the best job is very hard work a lot of the time.

Also, I encourage people to keep an open mind about their future! I could have done many other things for a living and been happy doing it, such

as working for an environmental organization, a consulting company,

government, or industry. I feel very lucky to have landed where I did, but I know that this was not the only path I could have enjoyed. Actually, I had a bit of a crisis myself about whether or not I wanted to do a Ph.D. I was worried it might prevent me from doing the kind of work I'd most enjoy and being outdoors. I sat under a tree in Victoria pondering this problem in the summer of 1990. Suddenly, it occurred to me that I could always leave it off my resume if I wanted to change course!



That being said, research is effective training for lots of jobs. It teaches us how to use logic and information to answer questions and solve problems. These skills apply to everything in life, personal and work related. Research experience also involves a lot of oral and written communication, two more skills that apply to virtually every kind of job. Often research requires working effectively as part of a team, another essential skill. For all these reasons, I think that learning about and conducting research is a great way to support any career path, even if you're not planning to be called a researcher.