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Transcript

Nancy Green

So let's talk about the Green a little bit and let's start with the most important aspect, I think, of the Green. Why is the Green such a special river in the Colorado River system?

Jack Schmidt

I would say the Green River's a special river because of its context. The Colorado River system has more dams on it than any other large watershed in North America, so although the Colorado River as a watershed is a relatively small river, it's not within the twenty-five largest rivers in North America. Relative to its size, it has many reservoirs that are large. So, within this watershed that has more dams and its waters are more diverted than any other, the Green River is the least altered, and the most natural watershed within the Colorado River system. So, the Green River is special because it stands out as the one relatively wild part of the river that is left.

Green

So basically, what have we done to the Colorado River system?

Schmidt

The Colorado River, the Colorado River system carries snowmelt from the Rocky Mountains to the Sea of Cortez. That is what, by nature, it does. And it is Rocky Mountain snow melt water that crosses this great, vast desert of bed rock canyons that we call the Colorado Plateau, and by nature the Colorado River was this an enormous pulse of snow melt from the Rocky Mountains, and carrying an enormous amount of sediment eroded from the deserts of the Colorado Plateau, and carrying that water and sediment down to the Sea of Cortez in Mexico. What has happened, is that human society in the nineteenth hundreds built enormous dams in that system. Lake Mead is the largest reservoir in the United States, Lake Powell is the second largest reservoir in the United States. We've built enormous reservoirs, Flaming Gorge Dam, Navajo, dams all over the place, those store the water and so we have eliminated the normal, snow melt flood that would occur predictably every year, and we have eliminated the vast amount of sediment that used to be transported by the river. We've also tremendously altered the river's temperature, and so the changes in eliminating the flood, eliminating the sediment supply, and changing the temperature, have then fundamentally changed the form of the river channel, and changed therefore the habitat for the endangered fish, and therefore changed the regime that's supported the natural flood plain vegetation. Within that context, there are parts of the Colorado River system that are tremendously changed. The Colorado River's delta in Mexico essentially is nothing like what it was. The

Colorado River between Hoover Dam and the Mexican border is utterly transformed, it's channelized. It has essentially almost it has very little left like the river of old. The Colorado River through Grand Canyon is essentially a completely sediment starved system, with a natural - with a hydrology very unlike what it once was. And then you go to the headwaters, and the three headwater branches, the San Juan River, the Colorado coming out of the state of Colorado, and the Green River, are the three branches, and of the three branches, the one that has been transformed the least, is the Green River.

Green

So we've altered the river. Give me that in a nutshell.

Schmidt

We have transformed the natural watershed of the Colorado River into a vast plumbing system of dams and diversions. We have altered the floods, trapped the sediment, changed the temperature. The Green River is notable, because it is the part of the system that is changed the least.

Green

And how rare is that, to have a river that hasn't been changed?

Schmidt

There - in the lower forty-eight, there aren't many left. I can think - the Yellowstone River in Montana, there are bits and pieces of the northwest. The Green River is a very special place, certainly within the context of the most heavily utilized river in the Colorado system.

The Green River, and the Green River's unique because it is so relatively, you know, it has been perturbed to such a small degree relative to the rest of the watershed.

Green

This river that is unique, because it hasn't changed -- what's that like, as you float down, what do you see, what's that experience like for you?

Schmidt

You know, there is a problem in knowing too much, and when I float any of these rivers, I am aware of how they've changed. I have taken the time to acquire old photographs, taken in the late eighteen hundreds, taken in the early nineteen hundreds. I'm aware of what kind of invasive and exotic vegetation has been introduced, and so, in one sense, I am aware of how each of these rivers segments have changed, and I'm aware of rivers such as the Colorado River in Grand Canyon, which have changed a tremendous amount. Parts of the Green river, especially in Desolation and Grey Canyon, feel much more like the river of old, and so in that sense, I probably feel like my boat is a time machine, and that

I can go back and I'm sort of running a river that's not all that different from the river that people fifty years ago or a hundred years ago floated. So there are - Desolation and Grey Canyon on the Green, and Cataract Canyon in Canyonlands National Park, are the two segments of the river that probably feel the most special in that regard.

Green

On the river, is it similar, were they the same rapids that Powell went through?

Schmidt

Yes. There are attributes of these rivers that really are unchanged. The rapids along the rivers are in exactly the same places that Powell experienced them in 1869. The difficulty of the rapids have changed, because any of the rapids along the rivers are in there locations because they're at the mouths of tributaries, that bring big boulders into the rivers, and so the fact that the rapids, whether you're in Lodore Canyon or whether you're in the Grand Canyon, the rapids are just where they've always been. Now that said, in a hundred and plus years since Powell's first journey some rapids have gotten easier and some rapids have gotten an awful lot harder, and that's because in a hundred and fifty years some canyons have had flash floods that have brought boulders in, Crystal Rapid in the Grand Canyon, Warm Springs Rapid on the Yampa River, are completely different than they were before, and other rapids have changed in subtle small ways.

Green

When we floated Desolation Canyon we went through a rapid that had just see a dramatic change.

Schmidt

Yes, and that's Joe Hutch Rapid that flashed in August of last year in Desolation Canyon is a much harder rapid, research scientists, who are colleagues of mine, are going to go in this year, and begin to measure the changes. We've measured similar affairs in Lodore Canyon and in Whirlpool Canyon, so yes the river is dynamic, debris comes in, the rapids get narrower, the rapids are full of boulders, and then main stem floods come down the river and then move things around and readjust things. So, one thing that happens below dams, is that when you don't have those big floods come down, the rivers can become choked, and then they don't get re-widened, and so in the reaches immediately below the dams, Red Canyon, Lodore Canyon, you don't have the big floods that you used to have to re-mobilize things. In Lodore, in Deso, in Grey Canyons, you do have those big floods, and that's part of the reason why Joe Hutch rapid will stay, Cow Swim rapid will stay around for awhile, and then it will get easier with time as we get a succession of big rapid-or floods come through.

Green

With that, it seems like a river is a very live biological, living system, that it's not just a body of water going down a path. Explain to me how a river is a living system.

Schmidt

Rivers have existed on this planet as long as there has been rain on continents. About four hundred million years ago, the shape and character of rivers began to change when there began to be land plants on earth, and then river form actually changed. So a river in the earth that we experience today is fundamentally a pulse of water. And that pulse of water moving through a valley excavates a channel. There is an amount of sediment and there are sizes of sediment that get moved by the forces of moving water. So every river on earth has its own characteristic range between how big the floods are, how big are the highs, how low are the lows. What is a temperature of the water during the highs, what's the temperature of the water down during the lows, is there a lot of sediment coming in, is there only a little amount of sediment coming in. That's the physical template, that's the pulse of the seasons, that's the melting of snow, that's whether or not you have a monsoon season flood. Life then has figured out, as it were, how to deal with that and exploit all the attributes of this physics based pulse of water and sediment, and so land plants have adjusted in the land plants that live along the side of a river, on a river that has a tremendous big flood, and a very low low, develop one strategy and so the plants along the banks of a river adjust to that, and then the fish and the invertebrate community of the river adjust itself. So, what makes the Green River unique, if you look at the life history of the endangered fish at the Green River you can match each of those fish developed a strategy of how to exploit something distinctive about the physical pulse of water through the system. And so the Colorado Pikeminnow spawns - its primary spawning area is in the lower most part of the Yampa River in Dinosaur National Monument, and it would spawn on the receding limb of the annual flood, and its larvae would emerge out of gravel and be swept downstream as the river was receding from its flood. And so by the time those larvae would make it to the Uintah Basin upstream from Deso and Grey Canyons, sand bars would have started to pop out and become emergent along the river and those larvae would be swept into little pockets of slack water in the downstream edges of those bars, and grow up there in their first year of life. The Razorback Sucker alternatively would spawn on the rising limb of the flood, and its larvae, as a river would go to flood and the river would overtop its banks into its flood plain lakes, would be swept in there, and that's where it would grow up. The Humpback chub and other endangered fish lives in the eddies and takes advantage of the eddies and the rapids and Deso and Grey Canyon down in the Grand Canyon, and only lives in the canyons that have rapids and eddies. So, the Cottonwood, the Cottonwood releases its seeds during the receding limb of the annual flood, and then its seeds would, some of them would be blown onto damp wet sediment just as the river is losing its flood, and then would go from there. So those are all ways in which life has exploited some physical attribute of

the river that makes the Colorado distinctive. Every one of the fish species figured out how to live in a river in which at some point during the year, the river would carry a tremendous sediment load, and somehow the rivers could figure out how the fish could figure out how to survive that. So what has happened with dams is we have essentially built dams to change the natural hydrology, because the river that has a really high high, and a really low low is not a river that's easy for farmers to divert. A river that has a tremendous sediment load is not easy to drink.

So when we build a dam or we build diversions we are intentionally changing the natural flow of water and sediment and the temperature of the water. Now we do that for a reason - if you have an enormous flood, such as what used to occur in the Green River and in the Colorado River in the early nineteen hundreds, that big flood wrecks havoc if you're living next to the river, let's say, or if you have farm fields next to the river. And so what humans want to do, is build a dam, take the big flood of water, store it in a reservoir, and release the water in an even steady flow all year long, which then can be diverted in canals, whether the canals take water to Salt Lake City, Los Angeles, Phoenix, wherever the particular canal is. So, what we do as humans to utilize a river is we change everything about them, we eliminate the floods, we make the low flows higher, we take the sediment out of the water so it's clear, and immediately below the dams we give them a constant temperature. Well, guess what? The life of the river of the past, the life that evolved in the river over the millions of years that the Colorado River has existed. That life doesn't do very good. If you were a species that figured out how to live in a river that had a wily big flood, and really low low, and tremendous amounts of sediment, and got really cold in the winter, and got really hot in the summertime, and suddenly the river didn't have a flood, was clear, and was the same temperature, well, you wouldn't think that would be so great. So, everything that evolved in the river of old now is jeopardized by the transformed river of today. Alternatively, we then have introduced into the river trout, trout love - trout below Flaming Gorge Dam, trout below Glen Canyon Dam, love clear water, cold water, a reasonably steady flow, and so we have other species that humans have introduced into the river, or we've introduced warm water game fish into the reservoirs, and we've introduced cat-fish and carp, and whatever into some of the warm water sections of the river, and so there are other species that love the artificial river. So we could sort of say there are the species of the past, I call them the relics of the past, the relics of the old river, and we have other attributes of the river that are there only because of dams, and we've essentially created now parts of the river system which benefit the artifacts of dams, and we have other places in the river system where the relics of the past still hold on-Desolation and Grey Canyon, the lower parts of the Green River, the modern Yampa river-are places where the relics of the past live on.

Green

Earlier, you told me about your experience on the Ganges River in India and how

people related to it as an entity, not just water in a stream. Tell me that story.

Schmidt

About a decade ago I was lucky enough to travel to India to go to the Kumbh Mela, one of the great holy gatherings of Hindus, on the banks of the Ganga, what we in English language call the Ganges. In India, the river is a goddess, it's not a manifestation of a goddess, it is a goddess, but the irony is in the traditional Hindu belief, the water is the goddess, so people take a jar of the water, and take it home, and they have the goddess. And what goes with that is that the irony is that the Ganges is a terribly polluted river with many industrial effluents entering it, dried up, heavily diverted, and I found myself visiting with Hindu holy men, Swamis, about the concept that a river was much more than simply 'the water', and that if you had a river, and it still had water in it, but the river was now polluted rather than clean or if the river no longer had its big flood pull, so if the river was dried up, that was not the same river, and that was perhaps not the same goddess. I mean, who am I to, who am I to have the nerve to tell someone what their belief system is? But, a river is more than just the water, and one, and so the Green River or the Colorado River System of today is a very different river than the river that that Europeans first became acquainted with hundreds of years ago.

Green

Is there value in maintaining rivers in the old way?

Schmidt

You saw my hesitation cause like 'oh man, here's the one I don't have the answer. We live on a planet in which human societies have tremendously altered the natural landscape. In the Intermountain West the rivers of the Intermountain West are amongst the most biologically diverse and most wonderful environments that we have. Most of the rivers that we have in the Intermountain West have been tremendously altered by the structures of dams and diversions that we have built in place. The Wasatch Front, the Colorado Range, Phoenix, Southern California, Las Vegas, they are all maintained by big canal systems that bring water in from afar, that bring electricity from hydro electric dams from afar, and we have precious few wild remnants of the past. The Colorado River System as a whole had a greater proportion of species living in it then-that occurred nowhere else on earth, than any other water shed in North America. The river of old, the Colorado River System was such a hard place to live that seventy five percent of the native fish of the Colorado River System live nowhere else on the planet. Well, when you extensively dam and divert it, those species suffer, and so the preserving the river of the past is giving us a glimpse of what the old planet was like, what the landscape and the fish and the riparian vegetation, what the river was like that the first Europeans and the first pioneers coming on the Oregon and Mormon trails, that the first settlers along the river had to grapple with. For many of us, myself included, I get a tremendous sense of peace when I am lucky enough to explore those places. It's part of my heart

and soul, and why I do what I do. I'm not so naive as to say that we can return to that-to those rivers everywhere, if we did we would not be able to sustain the population in the Wasatch Front, or any of the other big metropolitan areas, and so we have unalterably changed the planet, but to keep some of those places left, the rivers of the old and everything that is unique about them is certainly key to me understanding who I am.

Green

So..

Schmidt

I think that, I think that the recognition that human societies choices to develop areas, to live in areas, comes with a price, and the price is changing the wild continent that was here. To some extent the fact that I can point out the Green River, and say the Green River's still a relatively wild place, is highlighting the fact that we have an opportunity to consciously decide whether to work with the solutions needed to maintain society, and yet still maintain a wild place. Without implying that we can do that everywhere, I've been lucky enough to see other parts of the planet, if one goes to Western Europe, the Europeans don't have the choices that we have, virtually every river in Europe is a transformed place. No one in Europe can be so naive as to think that they can return the continent to pre-human contact. Would one go back to Neanderthal Europe or, one certainly can't go back to Roman Europe, they were building aqueducts and heaven knows what. If one goes to India, one sees massively polluted rivers. If one goes to China today, one sees a country desperately trying to build dams to produce hydroelectric power everywhere. We are lucky in North America, in the United States, and in Utah, to be able to make a conscious choice to leave some places relatively unimpaired. This isn't to say that we'll ever return the whole deal, that's impossible unless we were to de-populate Utah, but we can have a Green River that's only minimally impacted by humans.

Green

Is this a value judgment? Is it something where we want to say, where we have to say 'ok, we want a wild river, what's important to me, a fishing area, a wild and scenic river, or drinking water. Is this something, discuss that, how maybe we need to look at what our values are.

Schmidt

Some of my colleagues probably disagree, but I have come to believe that that it is fundamentally an issue of public policy and values that will decide the future of the rivers of the Intermountain West. There are attributes of our rivers that are environmental, but they're environmental values that are artifacts of dams, tail water trout fisheries, artificially high base flows to facilitate easy rafting, flood control...On the other hand, there are environmental attributes of rivers that are relics of the past, the unique fishery, the distinctive riparian forests, the big abundant sand bars along some of the rivers that people would camp on, the

artifacts of ancient civilizations, and I'm not willing to say that one or the other is uniquely more important any more than, well and I will say that I like water coming out of my tap at home. We use electricity, so we use - we put rivers to work, and we celebrate different attributes of rivers. So what I would say is, how we balance those is a decision of values, and I would say that transforming every river in the Intermountain West, so they all look the same and they're all artifacts of dams, and they all of sort of function like irrigation canals, and they all have riparian forests that are dominated by non-natives, or filled with tamarisk, or filled with Russian olive, or that they no longer have the pulse and feel of the wild river of a hundred years ago, we don't have to have that. We could have some rivers that are like that, unfortunate sacrifices to accommodate human civilization, but we can also have wild rivers. We can also have rivers that still have a healthy native fishery, that have a healthy native riparian forest, that look and feel and behave like the rivers of a hundred years ago. We can have both.

Green

I want to talk about some of the pressures on the Green and Yampa. How critical is the Yampa River to the Green?

Schmidt

Yep. When I think about the Green River watershed, I think about the Green River as having two head water branches, that each are-that are equally important. One of those head water branches is the Green River upstream from Echo Park, I call it the upper Green, the other co-equal branch is the Yampa River. When those two rivers come together they have the same average flow, they once had the same flood pulse, both had similar floods, the Yampa's river flood would come down a little bit earlier because its head waters are in Colorado, and would melt a little bit sooner than the head waters of the upper Green River in the Wind River range of Wyoming. Today, Flaming Gorge Dam completely controls the flood regime and the sediment supply that drained out of Wyoming, and so the reach of the Green River between Flaming Gorge Dam and Echo Park, is a highly altered river, at Echo Park this other equal branch of the river-the Yampa River comes in and then below Echo Park the rest of the Green River - Whirlpool Canyon, Island and Rainbow park, Split Mountain, the Uintah Basin, Desolation, Grey Canyon, Labyrinth Canyon, Stillwater Canyon, the natural flood that travels all the way through the state of Utah essentially comes from the Yampa River, and so all of the elements of wildness of the Green River in Utah come because the Yampa River is the one large piece of the system that is essentially un-dammed and undiverted today. Whereas, one can look at the Green River and say the Green River is a wildest part of the whole Colorado River System, within the Green River one can take the Yampa River, the Yampa River is the wild part of the Green that holds everything else together.

Green

So what would happen if one of the proposed water projects went through, how would that affect the water flow?

Schmidt

If the natural flood of the Yampa River were changed, if the Yampa River were dammed, if the natural flood were eliminated from the system the rest of the Green River, from Echo Park all the way to Canyonlands National Park would change. Obviously it's a matter of degree, if you said I'm going to take a teaspoon of water out, I can't measure that, but I can tell you that it is the natural flood of the Yampa River that maintains the wild character of the rest of the river, and if you change that in extreme you would fundamentally change everything about the river downstream that hinges on the wild river of the past.

Green

It's hard to say this many acre feet could change it, but some of the projects that are out there, are they talking significant amounts of water?

Schmidt

There are proposals on the river today to divert water from Flaming Gorge reservoir and a different one to divert water from the Yampa River. Predicting the downstream impacts of those proposals hinges on knowing the specifics of how much water will be diverted in a wet year, how much water will be diverted in a dry year, how much water will be diverted when the river is in flood, and how much will be diverted when the river is in low flow. Sometimes people think that the river in flood is a river carrying wasted water, and therefore that a river in flood is a river carrying water that can be diverted without changing the downstream habitat and characteristics of the river. The river in flood is the river re-shaping and rejuvenating its habitats. And so it will be just as important to know what the details are for the proposals to withdraw water out of the system in flood as it is to understand the details of what happened-how much water would be diverted at low flow.

Green

How likely are these projects to happen?

Schmidt

The Colorado River System and the Green River in detail, is a river really at the nexus of an uncertain future, and as a river caught in many different historical time frames. The proposals to divert water out of the Yampa River, and probably out of Flaming Gorge reservoir are wholly and entirely legal. They probably fit within the Colorado River compact that was negotiated in the nineteen twenties. That said, the river of 2009 is an utterly different river, with utterly different demands on it, and those withdrawals may not...those withdrawals are probably not consistent with protecting the natural values that we have left to protect on the Green River, even though they are entirely legal.

Green

It seems like our legal system when it comes to water only sees value if the water is used in some fashion for beneficial use. That leaving water in the river isn't necessary viewed as valuable, is that how we look at water in the West?

Schmidt

Traditionally, yes. However, we have increasingly changed in the West to value rivers, we passed an endangered species act, and we've listed fish, and we know that fish need water. We have a wild and scenic river act, we know that there is value to having wild rivers and scenic rivers. The reality is that we have more hope and we have more options in the Green River and in the Colorado River system than we have in many other places. This may be heresy but there are very high end users of water at the lower end of the system - Southern California, Central Arizona, Southern Nevada. Water from the Rocky Mountains has to stay in the rivers to get to these very high end users at the lower end of the system, and so water being used by someone at the downstream end of the system...we get lots of environmental values because that water stays in the rivers. We get all those environmental values of having wild rivers in the upper end of the watershed. At the same time we're fulfilling demands downstream. In contrast, a river like the Rio Grande is entirely diverted by users in Central New Mexico, and then El Paso and Juarez, and downstream from those big withdrawal points there's essentially no river left, there is no river left. And so the opportunities in the Colorado River System come from that fact that we have historical users with historical rights way down at the bottom end. Now, down there they take all the water out. If you're in Mexico, if you're focused on values in Mexico it's a whole different deal, there's no river left down there, but in the upper end what we have a choice here is we have a choice of taking the water out in the upper end, but then we lose the natural values up here, or perhaps marketing or selling or otherwise letting that water flow downstream whether that water ultimately goes to Saint George, whether it goes to Las Vegas, whether it goes to L.A. in southern California, whether it goes to Phoenix.

Green

But people in Colorado and Utah often don't want to do that.

Schmidt

But it causes a mindset because the users in the upper end are Wyoming, Colorado, and Utah. Now ironically Utah has often been the most innovative in suggesting that maybe it would not develop all of its Green River resources in exchange for being able to sell or market that water to downstream users. That is heresy amongst some Utah water users, but even the Leavitt administration proposed that at one time, and at some point we're going to have to realize that this is the nation's river, we're all in this together, we all send our kids to fight wars overseas, we all pay taxes to the same government, we all elect the same president, we're all in this together, and we're going to have to think about the river as being one coherent watershed rather than Colorado getting it's piece, Wyoming getting it's piece. We might just have to ask what would be in the best

national interest.

Green

Is there a way though to see, how do we know when a river's dying? How do we know when we've overstepped our bounds?

Schmidt

There are rivers in North America that have been fundamentally changed. The Colorado River as it crosses the Delta in Mexico, parts of it don't have any water except in a wet year. So I would submit that a river that you can't float a boat in, and that you have to get out and walk, isn't a river. The Rio Grande downstream from the El Paso Juarez valley is an impenetrable jungle of non-native vegetation that you can't canoe, it's referred to as 'the forgotten river' and there's really no path through it, because the river has such a tiny amount of flow, it's so engulfed in vegetation, there's no path there. There are parts of the Duchesne River in Utah, particularly downstream from Randlett, between Randlett and Ouray, that the river is a shadow of it's former self, because so much water has been diverted out of it. Parts of the San Rafael River are very different from the river of the past because of because of diversions, so it is possible that if you take all the water out of a river, or if you so tremendously pollute it, it's no longer a river. But the Green River is far from that, the Green River has clean water quality, it has an abundant amount of flow, the river is on a complete other extreme from that. The Green River does have a tremendous burden to bear in terms of non-native vegetation, there are parts of it that are swamped by tamarisk, Russian olive has taken over in small parts of it, the native fishery holds on despite probably eighty five percent of the bio-mass in the river is non-native fish that compete with the native fish. To me, you evaluate a river's health by comparing that river to the river of the past, and it's the degree of change, how much has the hydrology been changed, how much has the temperature regime been changed, how much has the sediment flux been changed, what is the proportion of native to non-native fish, and flora and other fauna that lived there in relationship to the river of the past. So it's a degree of change, is how I measure health.

Green

What should we be asking ourselves, do you think? What questions should we be asking ourselves about rivers and their use?

Schmidt

Well I think, with the Green River, we can ask ourselves what kind of river do we want? We don't have to say, 'well our population is growing, well our needs are growing, we have to change it'. I think that with the Green River we can really meet society's demands for water and electricity, and at the same time have a wild river, but to do that we would have to have the courage to declare the river to have some sort of protected status, and to say 'we're going to withdraw and develop water in other parts of the Colorado River watershed, and we're going to

leave the Green River alone'. In my mind, it's not even clear to me that Flaming Gorge Dam is necessary. We could produce a tremendous amount of electricity at the other Dams in the watershed. We have an enormous amount of reservoir storage elsewhere in the watershed, we can still get water to St. George if we need to. We can develop the rest of the watershed and essentially leave the Green River alone, if we want to, but it's always easier to extract a small price out of everything, it's politically harder to say, 'we're going to make this place special, and we're going to make our developments elsewhere', but if we chose to do that, we could make the Green River a very special place.

Green

It seems like the Green doesn't get much attention though at least from much of the environmental movement. It seems like the Glen Canyon Dam gets a lot of press. Grand Canyon gets a lot of press. Why is that?

Schmidt

The Colorado River system although small in size is great in name. You could arguably say it's the most famous river in the United States, or it's one of our most famous rivers, and it gets its fame started with the journey of John Wesley Powell, it gets its fame because of the majesty of the Grand Canyon. There is no question that the system as a whole is this tremendous river and with this tremendous fame because of its, its beauty, it's interesting. If one charts the history of the American Environmental movement, the American Environmental Movement got a large amount of its start on the Green River when there was a proposal to build a dam near Echo Park in present day Dinosaur National Monument and to build a smaller regulating dam at Split Mountain. The fight to stop those dams led to the growth of the Modern Environmental Movement, if you go to Dinosaur Monument today there's a plaque and recognizing that fight, recognizing the contributions of David Brower to stopping that dam. Now, admittedly there are those who are bitter that that dam wasn't built, if those dams had been built the river that we talk about today would be - we would not be having this documentary, because the Green River would be this awesomely transformed into essentially a canal, completely overwhelmed by tamarisk, with a hydrology unlike today. You would not be describing Desolation and Grey Canyons as a wild place, we would be talking about Desolation and Grey Canyon in a very different way. So, public concern about the Green River was tremendous in the nineteen fifties, but after that, the proposals were to build the dam at Glen Canyon. The next big fight became the fight to stop Glen Canyon Dam, then there were proposals to build dams in the Grand Canyon, the fight went on to stop the dams in Grand Canyon. The political power and influence of Grand Canyon and Grand Canyon National Park is deserved, it is one of earth's greatest statements, as David Brower said, but that said the Green River is this awesomely spectacular place, that's largely been forgotten by river conservation groups, by river environmental organizations, and yet it retains its great values. Dinosaur National Monument is one of the most majestic suites of river canyons in this country. Canyonlands National Park is an awesomely spectacular place.

Desolation and Grey canyons are one of the greatest experiences one can have. The Green River in Red Canyon below Flaming Gorge is amongst the most heavily fished trout water in the country. The Green River is full of values, and yet it is largely, it's known but it doesn't have anything like the hype of Grand Canyon. It has been forgotten.

Green

You mention the Colorado system, it's an old system. How old is this river? How old is the Green River, approximately?

Schmidt

When we talk about the age of any place on the planet we talk about how old are the rocks, how old did things get lifted up and shifted around, and how long ago did the present topography exist. The Green River has sort of been flowing roughly where it is for much longer than for instance the river has been in Grand Canyon. Grand Canyon is about five million years old, at least it started to be formed about five million years ago. The Green River is fifteen-twentyish million years old, but we know that the Uintahs are like sixty million years old. The Green River is tens of millions of years old, roughly cutting its course and roughly being where it is.

Green

What are some of the pressures facing the Green today?

Schmidt

The Green River is the least utilized of the big river parts-of the big part of the Colorado River system. The biggest change to the river came with completion of Flaming Gorge Dam in November of 1962. The next big threats were the proposals at the same time to build other dams that were stopped. Since that time the Green River has been relatively on auto-pilot. Without much else being asked of it. In fact, changes have been made on the Green River to improve its environmental benefits. We changed a great expense, the elevation at which water is withdrawn from Flaming Gorge reservoir, so that the river downstream wasn't as cold as it was. Agreements were set in place to use releases from Flaming Gorge Dam to mimic the natural flood of the Yampa River to make it even a little bit wilder, so we have been moving the river, the Green River so it was even a bit wilder place. Today, there are new proposals to withdraw water from the river, and those new proposals certainly are substantial potential threats to changing the wild river, that's the proposal to withdraw water from Flaming Gorge reservoir and build a pipeline and send that water to the Colorado Front Range. The proposal to withdraw all unappropriated water in the Yampa River basin for potential use in oil shale processing. Another proposal, which would sort of change the character of the river environment, perhaps not take a large amount of water from it, but certainly change the rural character of the river, would be the proposal to build a nuclear power plant on the banks of the river near the town of Green River, Utah. I don't know that that would take as much

water, but it would certainly change the rural and wild feel of the river to have a large power plant.

Green

That'd suck up a lot of water. What about oil and gas development, is that affecting the river?

Schmidt

The river landscape is certainly changing today. I know that when I drove to the boat ramp at Sand Wash in 1980 to do the first river trip of my life, I felt like I was in the middle of nowhere when I drove from Myton to the put on at Sand Wash. Today much of that drive feels like I'm driving on a dirt road through an industrialized zone, and the drive through Nine Mile Canyon out to Sand Wash feels much the same. When one launches on the river, one can't precisely see oil derricks from a boat, but certainly we're changing the look and feel of the landscape around the river with oil and gas development. There are allegations that wastes have entered the river from overflowing control ponds and treatment ponds associated with oil and gas, I don't know the details of it, but certainly that's been implied. But one of the things is when you're in a canyon, your field of view is actually pretty limited, and so I think the truth of the matter is a lot of things can go on not too far from the river that you don't know about it.

Green

I've read that the Green is an exotic river, what does that mean?

Schmidt

An exotic river - the Green River and the Colorado River system is referred to by geographers as an exotic river. There are many rivers like this on earth. They carry water from distant places across arid places, the Nile River is an exotic river, it carries water from the tropical high precipitation Central African continent across the Sahara to the Mediterranean. The Tigris and Euphrates carry water from the distant mountains across an arid land. The Indus, The Ganges, are all exotic rivers. The Colorado River is an exotic river. The Colorado River is Rocky Mountain snow crossing the desert, and then in the desert are the great demands, we want part of that river to take to our desert cities.

Green

Thanks