

The radio segment below aired on October 30, 2015 on KZYZX “Consider This”. This is part two of Cal Winslow’s series where he interviewed Will Russell, Associate Professor at San Jose State and discussed current forest issues, forest management, and timber production.

Mendocino Redwood Company found a number of comments that would benefit from additional correction, clarification or commentary which are presented on the right side of the page in green italics.

Substantial factual information on Mendocino and Humboldt Redwood forests and its practices are available at www.mrc.com. Wherever possible we have provided direct links to specific material on our website to help the readers have easy access.

Text of Radio Transcribed audio begins below and spaced to allow facts to line up with the radio piece text.	<i>Facts about Mendocino Redwood Company</i>
<p>[BEGINNING OF ARTICLE BELOW]</p>	<p><i>Mendocino Redwood Company (MRC) was created in 1998 from lands purchased in Mendocino and Sonoma counties with the publicly declared mission to be good stewards of the forest and at the same time run a successful business. We have made significant progress in that regard:</i></p> <ol style="list-style-type: none"> <i>1. Adopting policies to make MRCs forestlands FSC certified (since November 2000);</i> <i>2. Adding more than 1 billion board feet of redwood and Douglas fir trees by lowering the rate of harvest;</i> <i>3. Defining of old growth down to the level of an individual tree, along with implementation of a policy to protect all individual old growth trees across our property;</i> <i>4. Elimination of traditional clear cutting from our property;</i> <i>5. Long term investments to improve habitat for fish across the property by controlling or holding back more than 1 million cubic yards of sediment (more than 100,000 dump trucks of dirt) from the coastal streams flowing through our forest;</i> <i>6. Removal of more than 36 long time fish barriers, increasing fish bearing streams by more than 20 miles.</i> <i>7. Operating as an open and transparent business; including an open invitation to take interested individuals anywhere in the</i>

Cal Winslow: ...I've asked other speakers the same question, but looking at the bigger picture, how would you assess the state of the coastal redwood forest today with large, the forest all together? What would your take on that be?

Will Russell: In this moment in time I would say it was a highly disturbed system. It's received an enormous amount of impact from human causes, timber harvesting, development, all those sorts of things. At the moment it is a forest that is sort of, I would say, at the crossroads. We're going to have to decide what the future course is for that forest, and we are deciding what that is right now with our management choices.

Most of the forest has been harvested. I think there's somewhere between three and five percent of the original old growth left depending on whose estimates you look at, but somewhere in there. That means that at least 95 percent of the original old growth has been eliminated, has been changed into something else, these second growth forests.

Most of those second growth forests are continuing to be managed, so they are not going through this natural

forest;

8. Completing a substantial rebuild of our Ukiah sawmill, assuring that Mendocino County will have infrastructure in the processing of wood products for many years to come; and

9. Employing about 300 skilled employees in Mendocino County earning family-level wages and benefits.

From our inception we have encouraged transparency and we have a publicly stated policy of taking anyone to anywhere on the property to see our practices first hand. Additionally, we post our inventory and other forest facts on our website. You can find more information at www.mrc.com

recovery process. Yeah, I think it's a big question. Where they are now is a highly disturbed system. Where they are going to be in the future really depends on what we decide to do.

Cal: Following up on another point that I sort of interrupted you on, you've mentioned now the word "management" several times. I see that your doctorate was in management to some degree. [laughs] What's the word all about when we connect it to the redwood forest, the management of the redwood forest?

Will: Management itself just means that there's a human imprint on the forest. Whenever we do anything to a forest, we're managing it, for better or worse. In terms of redwood forest, most of the management has been management for timber.

In the old days, the management style was sort of a cut and run style. Starting in the middle of the 1800s, get as much timber out as you can and then bust out and do it somewhere else. There wasn't a lot of concern about what was going to happen in the future to those forests. There was a sense that the resource was essentially unlimited.

There were some changes that came about in the 20th century regarding try to slow the destruction of the forest, both in terms of conservation and preservation but also in terms of more careful management, replanting and re growing forests by timber companies. Today I think we see a much more careful type of timber management that we saw at the time, I should say in the old days.

Unfortunately this sort of lighter touch that's happening now is happening on a canvas of highly disturbed stands. If we had applied this lighter touch from the beginning, we'd be looking at a completely scenario than what we're looking at now.

Cal: How is that? Could you explain?

Will: For example, there's been a move towards selective harvesting in redwood forests by a lot of the timber companies, which is sensible when you look at the life history of a redwood. A little bit earlier in the show I was talking about old growth forests and how

MRC is regulated by seven (7) state and federal agencies, including CalFire, California Department of Fish and Wildlife, and the North Coast Regional Water Quality Control Board. Additionally, MRC voluntarily subjects itself to third part verification of forest practices under the guidelines of the Forest Stewardship Council (FSC) and has done so since 2000. Wood products originating from these highly regulated lands ensures protection of other forest benefits such as clean water, wildlife habitat, and carbon sequestration. Wood products imported from foreign countries without this level of environmental review cannot make this claim.

We publish our inventory and many other details of our forest management on our website. It is straightforward to find information on our management of the forest.

sometimes in winter storms a big tree would come down and knock down a few other trees. This is the sort of natural disturbance regime of a coast redwood forest, these small patches that are formed by one or two trees falling at a time. When you do selective harvesting in a redwood forest, you're mimicking that natural disturbance process.

Because you're mimicking that process, the forest is much more able to respond to it, to be resilient in the face of that type of disturbance, as opposed to clear cutting, which is not a natural pattern for the redwood forest. There's very few instances of large stand scale disturbance instances in coast redwood forest.

Clear-cutting was sort of the main strategy in the old days, the original logging days. When we're looking at forests in the Big River watershed or in Mendocino County in general, most of those forests were essentially clear cut at some point. Whatever management we're doing on them now, whether it be a single tree or small group selection, we're doing on this palette of a highly disturbed stand.

These stands haven't really recovered to the point where natural processes are in effect, and any type of harvesting is then sort of pushing them back, pushing the succession back so they're not able to recover fully.

Cal: Concretely, what would be a typical practice today in terms of the age of the trees, the general condition of the forest?

Will: Looking at a stand in the forest, what does it look like today?

Cal: What would the timber company do? What do they select? What's going on?

Will: Generally speaking they're still looking to select marketable timber. The trees are much smaller than they used to be when we harvested. What the trees are used for are not the same as they used to be. They're not used for structural work much anymore. They're mainly used for fencing and decks and whatnot. You can use smaller second growth timber to build those sorts of things.

Mendocino Redwood Company and its sister company, Humboldt Redwood Company, have practiced selective management of its forests since their inceptions. All management of these lands are focused on selective harvesting or, in the case where portions of the forest do not have the stocking to use this style of management, moving them towards a condition where they can be managed selectively in the future.

These trees these days that are being harvested are generally the largest trees that are available in the forest, but these are very small trees compared to what used to be harvested. Rotations right now are happening, I think, somewhere 40 years, 60 years, 80 years in some cases if we're lucky.

As I mentioned before, the natural recovery of redwood forest, you started to see a really good trajectory around a hundred years. We're not even getting up to the point where these forests are up to speed. When you think about it, a redwood tree can live up to, what, 2,400 years or more? A 40 or 50 year old redwood tree is really just a baby. It's a baby ecologically. It's also a baby in terms of its value as a timber product.

For the most part timber companies, because they have to make money on a quarterly basis, they're harvesting now trees that would be much more valuable in the future if they were able to wait to harvest.

Cal: It's just money? There used to be a stud mill at the end of our road, and sometimes the trucks would come by. It looked like they had a load full of logs that might be a foot in diameter, sometimes less. There'd be a few big ones. What was the point of it?

Will: What's the point of it? I suppose the point is to try to keep your quarterly profits up. If you cut a small tree now and you can make a little bit of money, in terms of economics, that's more valuable than a really nice tree in a hundred years. The timber companies are driven by profit. They are companies. That's what they do. They try to make money off of timber products. This is what they have to work with right now, are these small trees.

Cal: You mentioned, just kind of bringing it home for everybody, you mentioned decks, fences, and the difference between the younger trees and the older trees. I've heard a lot about that. As a scientist, what's the difference? Why is there a difference between the product when it comes from a young tree as opposed to an old tree?

Will: It mostly has to do with this heartwood/sapwood ratio. Anyone who's shopped for redwood products goes in and looks at...You look at some 2x4s or whatnot, and you'll see a red streak and then a white

The selective harvesting employed on MRC and HRC lands selects from all age and size classes. Thinning of younger trees occurs to decrease competition between trees. Some of the larger trees are harvested to release smaller trees adjacent to them.

The mission of both MRC and HRC is to manage the forestlands with a high level of environmental stewardship while operating a successful business. MRC has grown 1 billion board feet of redwood and Douglas fir trees (after accounting for harvest) since its inception. This volume is found in a variety of tree sizes, including large trees.

streak. Everyone is looking for the ones that don't have white streaks. They're trying to minimize the white streaks.

Those white streaks are the sapwood, and the sapwood is not really good structurally. It doesn't last very long. The heartwood in redwoods is the part of the tree that is impregnated with resins. It's very long lasting. It's resistant to fungus, termites, and these sorts of things.

Even on the younger trees, that heartwood is preferable to the sapwood. Sorry, I'll back up a little bit. On the older trees you have a lot more heartwood in comparison to sapwood, so that's good. You can cut big chunks of heartwood out of an old growth tree where you can only get a little bit out of a second growth tree.

Also in the old growth trees, if you have a tree that's 1,000 years old, for example, that heartwood has been impregnated with resins for 1,000 years. It's not just that it's more heartwood. It's that the heartwood in the older trees is much more valuable as a timber product because of its rot resistant properties, et cetera.

Cal: Selective logging is one thing. In terms of management we also hear quite a bit about thinning. Could you give us your ideas about thinning as a way of managing the forest?

Will: Yeah. Thinning is something that's used by virtually any timber company that's managing the forest for the long term, but in recent years thinning has become a tool for a lot of different reasons for

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1. Any redwood tree, = 48" diameter at breast height (dbh), established prior to 1800.

2. Any Douglas-fir tree, = 36" dbh, established prior to 1800.

3. Any tree established prior to 1800 (conifer or hardwood), regardless of dbh, with a preponderance of species-specific old growth characteristics.

4. Any tree (conifer or hardwood) established prior to 1800 that cannot be replaced in size or ecological function within 80-130 years regardless of dbh or presence of old growth characteristics. Generally, this fourth trigger is applicable to areas of exceptionally low soil quality, such as pygmy forest, pygmy transition soil, serpentine soils, or rocky outcroppings.

managing the forest. The first question we have to ask is, "Why are we managing the forest? What are we managing it for?"

If we're managing it for timber products, there's usually a couple different stages of thinning happening. Right after a cut you'll have trees grow very densely together the first 20 years or so, and then you might go in and thin it in what's called a pre commercial thinning. Those individual trees that are left over will grow faster, because they have more space, more sunlight, et cetera.

Then the company may go back in again and do what's called a commercial thinning where they're cutting out some trees that are useful for some timber products. They're not the best trees, but that will, again, space the trees out. They'll grow faster and bigger. It makes sense from cultural point of view.

The same tool has started to be used for other purposes, for reducing fire hazards and restoring forests. I'm using quote marks with my fingers when I say "restoring forest" in that case. In some forest types, moving out of the redwoods for a minute, thinning can be really important for restoration.

For species that are not shade tolerant, that need sun and space to grow and die back because of a lack of that, that can be really important. I'm talking about mixed conifer forests in the Sierra Nevada, pine forests, places like that. It can be a very useful tool for fire prevention and for restoration.

In redwood forest it really isn't necessary. I mentioned earlier in the show when I was talking about my grandmother's land, how she used to go out and push the little dead trees down in the forest around her house in the second growth forest. That was a natural thinning that happens commonly in coast redwood forests as they're recovering.

They die back on their own. The smaller trees die back on their own, and the larger trees continue to grow. Part of this has to do with the regenerative strategies of redwoods. Redwoods are the only major timber species that regenerate primarily from clonal sprouts.

When the lands of MRC were purchased in 1998, there was an imbalance of conifer and hardwoods, mainly tanoak. This was due to past management which did little to ensure conifers persist in areas where harvesting occurred. MRC has been active in restoring these forests back to a natural balance of hardwood and conifer. This does not occur in areas that are naturally-occurring hardwood stands where conifers have little success in growing. Stands are chosen for restoration where there is evidence, such as conifer stumps, conifer stands existed in the past.

When you cut a big redwood tree down, you'll have a whole lot of little sprouts come up from that, sometimes thousands of them. Over time they will slowly thin themselves out. One, two, three, four, however many of those stems will eventually survive to become big trees.

Through this natural thinning process, nutrients that are in the other stems, the stems that die back, can be returned to that old stump, that root base that is shared by all those recovering stems, the living stems. In a sense, when you're looking at a redwood forest, what you're looking at isn't a whole bunch of little trees necessarily but are a bunch of little branches coming off of the old trees that are still there if the stumps survive.

It's a very different situation. In addition to that, redwood trees are extraordinarily shade tolerant. They certainly need sunlight to grow. Every plant needs sunlight to grow, but they can survive under a shaded canopy for a very long time. Then when they get a little bit of sunlight, they'll shoot up.

You don't have this issue of mass mortality across landscapes that can lead to severe fire hazard or long term suppression of the trees so that they will never grow into big trees. Those things don't really happen in redwood forests. There's been, what I think, is a misapplication of these tools on redwood forests in terms of restoration and fire prevention.

Thinning is a tool to reduce the potential for stand-replacing fire, even in redwood forests. If fuel ladders are present to carry fire into the crowns of redwoods, the potential is very high for a stand-replacing fire if one occurs.



MRC redwood forestland after 2008 lightning fires

Cal: You probably have picked up on this. Fire prevention has become quite a big issue up here in Mendocino County. I think the MRC practice of what we know call hack and squirt is quite contested. It also raises the general problem of pesticides in forest management. I wonder if you have followed that issue at all.

Will: I haven't followed hack and squirt a whole lot. I know basically what it is, and I can say it's better than aerial spraying. [laughs] That's the best thing I can say about it. Whether it's necessary or not, whether it's the best way of approaching forest management or not, is a big question.

I think people are applying it primarily to areas that have been highly disturbed and are not growing back very well. They're doing this to try to limit competition. You can correct me or fill me in where I'm wrong on this. What are the species that are being hacked and squirted for the most part?

Cal: Tanoak.

Will: Right, tanoak. Tanoak is kind of seen as the big bad competitor in redwood management sometimes, which is, I don't think, entirely accurate. It's a species that grows in the understory of natural redwood forests. It's not really a competitor. Redwoods easily overtop it and shade it out in most cases.

The cases where they do not overtop and shade it very easily are areas that either have been managed so heavily that the redwoods are not sprouting back very well, there's too much sunlight, there's not enough shade, there's not enough moisture and in areas where redwoods would not be dominant anyway.

I think there's been efforts by managers, both timber harvest managers and conservation managers, people trying to do restoration on redwoods, to convert areas dominated by tanoak into redwood. I've seen this happening in Santa Cruz County as well as in Mendocino, efforts to "restore redwoods" to areas that they probably never dominated to begin with, say a dry ridge top, for example.

When the lands of MRC were purchased in 1998, there was an imbalance of conifer and hardwoods, mainly tanoak. This was due to past management which did little to ensure conifers persist in areas where harvesting occurred. MRC has been active in restoring these forests back to a natural balance of hardwood and conifer. This does not occur in areas that are naturally-occurring hardwood stands where conifers have little success in growing. Stands are chosen for restoration where there is evidence, such

You might have had redwoods there in the past, but they wouldn't have been big redwoods, probably. They wouldn't have been dominant necessarily. I'm not sure that hacking and squirting the tanoaks back is really going to change that situation. I think you're going to have struggling redwoods on those sites regardless of whether you're applying herbicides and cutting out the tanoak.

Cal: You mentioned aerial spraying. Is that something that still happens?

Will: As far as I know, it's not happening in Mendocino anymore. We had the big Garlon thing back in the '80s and '90s, but that's been shut down. There's certainly no aerial spraying in Santa Cruz County. I don't know of any instances where that's happening in a redwood range, but I wouldn't say that it's definitely not. I haven't followed that.

Cal: The local opponents of hack and squirt have made fire issues one of the points that they've taken to the public and to the supervisors. Maybe you could say something. I see that you have written about fire. Maybe you could say something about fire in the context of the redwood forest.

Will: Fire is kind of a tricky one in the redwoods, but what we can say is that old redwoods forests, old, big redwood trees, don't burn very well. If you want to really work towards a landscape that is not fire prone, over the long term what you want to do is promote the growth of big, old redwood trees wherever possible.

In areas that have been heavily managed, there can be impatience in terms of moving from an area that has smaller trees to bigger trees, but I'm not convinced that thinning out tanoak is really going to move toward a landscape dominated by big, old redwood trees quickly.

In fact, in some cases, leaving some of the tanoak intact may provide some shade, which in turn provides some additional soil, moisture, et cetera, that could facilitate the growth of redwoods over time. This is kind of a case by case thing, of course. Not every site is the same. As I said earlier, sites that were really never dominated by big redwoods are not going to be dominated by big

as conifer stumps, conifer stands existed in the past.

When MRC was formed, unharvested portions of the forest were studied to determine what a natural level of tanoak looks like. This guides the treatment of tanoak today by retaining a level of tanoak consistent with untouched portions of the forest. Larger tanoaks are typically retained for their value in acorn production and nesting opportunities found in their larger limbs.

MRC does not aerial spray its tanoak-dominated forests. MRC treats tan oak, selectively, by hand, carefully, in the woods, literally tree by tree, by notching the trunk and injecting a few milliliters of herbicide directly to the trunk.

When the lands of MRC were purchased in 1998, there was an imbalance of conifer and hardwoods, mainly tanoak. This was due to past management which did little to ensure conifers persist in areas where harvesting occurred. MRC has been active in restoring these forests back to a natural balance of hardwood and conifer. This does not occur in areas

redwoods in the future either.

With climate change, the sites that are suitable for redwoods, the areas that are suitable for redwoods, will likely be shrinking rather than growing. We're having a lot of fire issues that are related to climate, that are related to drought. I'm not sure that these efforts are really going to alleviate fire hazard in the long run, or even in the short run, for that matter.

A tanoak is a sprouter as well, like redwood is. When you thin out a tanoak what you get back is sprouts. After you cut the tanoak, they're going to sprout back unless you put so much herbicide on them that you totally kill them back, which is what the squirt is all about. [laughs]

Something is going to fill up that space, and it's not going to be a giant redwood in the short period of time. It's going to be something else. It's going to be shrub species. It could be highly flammable annual grasses. Something is going to fill that gap that is likely going to be flammable and provide fire hazard issues as well.

Cal: Let me pause for a moment again. This is KZYX Mendocino County Community Radio. The program today is talking about California. I'm your host, Cal Winslow. Our program today concerns the future of the redwood forest. Our guest is Professor Will Russell. He's the professor of environmental studies at San Jose State University.

Will, we have a bit of time left, good bit of time. We've discussed management now, and mainly management in terms of the companies. The forests are overwhelmingly in private hands. It seems to me that you've argued that there are other benefits of a redwood forest other than commercial. You've kind of become a spokesperson, really, for what you call a

that are naturally-occurring hardwood stands where conifers have little success in growing. Stands are chosen for restoration where there is evidence, such as conifer stumps, conifer stands existed in the past.

MRC has been successful in restoring over 60,000 acres of tanoak-dominated land to one of a natural balance of conifer to hardwood. Larger tanoaks are typically retained for their value in acorn production and nesting opportunities found in their larger limbs.

MRC treats tan oak, selectively, by hand, carefully, in the woods, literally tree by tree, by notching the trunk and injecting a few milliliters of herbicide directly to the trunk. The average use of herbicide on a per acre basis is 2.5 cups per acre.

MRC only uses herbicides as a last resort to restore the forest. If conifers are of a height where they are beginning to shade out the tanoak, herbicides are not used.

natural restoration. I think those two things are connected.

I'll try to help you along, but maybe you could go into some depth about your thoughts on these subjects and what you've written about them, and why you think, in both cases, you're onto something very important.

Will: I think what we can think about in terms of redwood forests and forests as a whole is the ecosystem services they can provide. There's a variety of things that they provide. They provide watershed, which is something we need. Yes, we need water on the coast and everywhere else. Healthy older forests are much better at collecting and preserving water than younger managed forests.

They provide wildlife habitat. More and more importantly what they provide is carbon sequestration potential. This potential in coast redwood forests is greater than in any other terrestrial system on the planet. They are able to harbor more carbon than any other terrestrial system.

I think at some point we need to balance the value, as a society, of extracting what's becoming lower and lower quality timber products from these forests and the potential of the forest to really do a job for us in terms of sequestering carbon.

What we found out in recent years...I shouldn't say we, I should say they, because this is, to a large extent, the

MRC and HRC both have key aquatic resources which are tracked through various monitoring programs. Both companies complete watershed analysis on their major streams and rivers to assess baseline aquatic conditions.

Both companies focus other monitoring efforts on understanding the distribution and habitat of sensitive aquatic species such as coho and steelhead, red-legged frogs, and tailed frogs.

Wildlife biologists also focus their efforts on surveys for terrestrial species such as northern spotted owls, marbled murrelets, and Point Arena mountain beavers. In addition, they conduct surveys to learn about biodiversity on our forestlands including surveys for: birds of prey (e.g. hawks), mammals, and songbirds.

For more detailed results of these monitoring efforts, please visit our website at www.mrc.com.

MRC has grown 1 billion board feet of redwood and Douglas fir trees (after accounting for harvest) since its inception. This volume is found in a variety of tree sizes, including large trees.

Redwood Climate Initiative that the Save the Redwoods League has been funding...have found, contrary to previous beliefs, that old growth forests continue to sequester carbon.

There was a previous assumption that the younger forests were better at sequestering carbon than the older forests. This turns out not to be the case. Older forests sequester carbon continually, and, in fact, they sequester carbon at a faster and faster rate. The older the forest is, the more carbon it sequesters every year.

Not just that it's holding more carbon, which it clearly is because there's a lot more biomass in old, big trees than there is in small, young trees, but that every year the rate of sequestration is higher than it was the year before. The older the forest is, the better job it's doing for us collecting carbon.

I'm not suggesting that we lock away every coast redwood forest. I think that's completely unrealistic and not necessarily the best situation for communities on the coast, but I do think we should start looking at the redwood range as a whole in terms of its potential for sequestering carbon, choosing areas that have the greatest potential, and putting them to work to do that.

There's a euphemism in the forest management and conservation arena called a working forest. That euphemism currently means a forest that people are working in, that is a forest that's being managed and harvested. I'd like to spin that in a different way.

A forest that's working is a forest that's working for us. The redwood forest in particular works very well for us all by itself with very little input from human beings. I really feel that we're missing an opportunity if we don't start thinking about redwood forests in the long term and what they can do as a mitigator of climate change.

Cal: For us in the short term, are there other values of the redwood forest other than commercial?

Will: Certain, yes. I mentioned before there's always ecosystem services, the watershed, wildlife potential, and all that. Something that I talk about in my class a lot, and something that's maybe not popular culturally, is the inherent value of the forest itself. We tend to

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MRC has grown 1 billion board feet of redwood and Douglas fir trees (after accounting for harvest) since its inception, resulting in increasing levels of carbon sequestration over time.

think about the value of nature from a human perspective. What can nature do for us? What can a natural system do for us? What can the forest do for us?

But there is value in the forest doing its own thing for itself. There is inherent value in the species that live there. There are processes taking place that we don't understand, that we barely understand. There's a lot we can learn from the forest still.

When you think about it, it's arrogant to think that we understand it well enough to manage it for all of these services, because there's thousands of species living together, interacting in ways that we don't yet know about.

I think it's valuable, not only for the forest [laughs] but for ourselves, to step back and allow it to do its thing whenever possible so that it can recover. It can be. It can exist. An added benefit, we can enjoy walking around in it and looking at it.

MRC and HRC have retained thousands of acres of older and old growth forests on their lands for wildlife and other values. Please visit our website at www.mrc.com for further details.