



Transcript of Virtual Public Meeting held on March 1, 2022 for the Proposed Action to Plant Seedlings in Board Camp Sequoia Grove

English Translation

WEBVTT

00:00:13.957 --> 00:00:17.727

which burned at high severity in the 2020 Castle

00:00:17.727 --> 00:00:21.037

fire. My name is Elly Boerke and I am the Program Manager for Planning and

00:00:21.037 --> 00:00:24.057

Compliance here at Sequoia and Kings Canyon National Parks. I'm

00:00:24.057 --> 00:00:27.797

also the facilitator and I'm going to start

00:00:27.797 --> 00:00:30.887

with a few introductions today. Walk through our

00:00:30.887 --> 00:00:34.177

agenda, provide some instructions on Teams in

00:00:34.177 --> 00:00:37.377

the use of this technology that we have at our disposal, and then I'm going to

00:00:37.377 --> 00:00:37.677

hand things over to

00:00:37.707 --> 00:00:41.617

Clay Jordan, our Superintendent, for an overall welcome

00:00:41.617 --> 00:00:44.987

and then ultimately hand things to the Project Leader to really take



00:00:44.987 --> 00:00:48.907

us away and get to the content and heart of this meeting. And so

00:00:48.907 --> 00:00:52.237

first and foremost, I just wanted to introduce a few people that are also on the

00:00:52.237 --> 00:00:56.497

call with us. Today I mentioned Clay Jordan, our Superintendent,

00:00:56.497 --> 00:00:59.607

Dr Christy Brigham, the Chief of Resources Management and

00:00:59.607 --> 00:01:02.847

Science, is also on the call. She will be the one presenting

00:01:02.847 --> 00:01:06.097

on the proposed action. Sintia Kawasaki-Yee, our Chief

00:01:06.097 --> 00:01:08.017

of Communications here at Sequoia and Kings Canyon.

00:01:08.057 --> 00:01:11.287

As well as Amy Brown,

00:01:11.287 --> 00:01:14.537

our Environmental Protection Specialist who is the lead NEPA planner

00:01:14.537 --> 00:01:14.977

on this effort.

00:01:15.817 --> 00:01:19.467

So quickly, what our agenda is for the

00:01:19.467 --> 00:01:22.657

next time being is that again I'll have

00:01:22.657 --> 00:01:25.847



Clay do an overall welcome and introduction. Christy will then

00:01:25.847 --> 00:01:29.187

walk through the proposed action and then we will

00:01:29.187 --> 00:01:32.467

open it up to you for questions, questions and

00:01:32.467 --> 00:01:35.977

answers. Before I hand things over though, I want to walk through

00:01:35.977 --> 00:01:40.157

a couple of things and just bring a couple of things to your attention

00:01:40.157 --> 00:01:43.327

First, we shared an announcement with you in

00:01:43.327 --> 00:01:45.747

the Question and Answer section of Teams that I want to bring

00:01:45.827 --> 00:01:49.817

to your attention, in case you missed it.

00:01:49.817 --> 00:01:53.037

First, we are recording this presentation and will post that

00:01:53.037 --> 00:01:54.757

recording on the project website following the meeting.

00:01:55.567 --> 00:01:58.607

The other note for you is that closed

00:01:58.607 --> 00:02:01.717

captioning is available to you. There is a link in

00:02:01.717 --> 00:02:05.617

Q&A chat that we encourage you to use, but you can also activate this



00:02:05.617 --> 00:02:08.917

individually via Teams. To do so, please click on the

00:02:08.917 --> 00:02:12.607

CC next to the gear in the bottom right hand corner of

00:02:12.607 --> 00:02:16.287

your screen and depending on how you're on how your screen is displayed, you may

00:02:16.287 --> 00:02:19.417

also find that CC under the settings in the upper right hand corner and that should

00:02:19.417 --> 00:02:21.337

allow you to select that option for closed captioning.

00:02:22.597 --> 00:02:25.617

We also like

00:02:25.617 --> 00:02:28.727

I mentioned, will be taking questions from you following

00:02:28.727 --> 00:02:32.387

the presentation. You may have noticed that as an attendee you are muted

00:02:32.387 --> 00:02:35.447

but we do want to hear from you. So, to submit

00:02:35.447 --> 00:02:38.767

a question you can click on the small question Mark icon in the upper right

00:02:38.767 --> 00:02:41.847

hand corner of your screen. Type your question into that

00:02:41.847 --> 00:02:45.047

field and click on the arrow on the right hand side. You

00:02:45.047 --> 00:02:48.287



may not see your question automatically. That will not

00:02:48.287 --> 00:02:51.687

be automatically posted for the chat for everyone to see, but

00:02:51.687 --> 00:02:53.567

we will be publishing your questions as we go through them

00:02:53.717 --> 00:02:56.987

following the presentation.

00:02:56.987 --> 00:03:00.147

Just in case we don't get to all questions today, we will still respond

00:03:00.147 --> 00:03:03.357

to those questions and we'll post those questions and answers to the public

00:03:03.357 --> 00:03:04.747

website for the project following the meeting.

00:03:05.517 --> 00:03:09.397

And yes, you can submit questions at anytime

00:03:09.397 --> 00:03:12.777

anonymously, or with your name, and we will again respond to you during

00:03:12.777 --> 00:03:12.787

the Question and Answer.

00:03:13.597 --> 00:03:16.887

And with that, I'd like to turn things over

00:03:16.887 --> 00:03:18.387

Clay Jordan, our Superintendent.

00:03:19.397 --> 00:03:19.767

Clay



00:03:21.357 --> 00:03:24.847

OK thanks, Elly.

00:03:24.847 --> 00:03:27.977

Welcome everybody and I really want to thank you

00:03:27.977 --> 00:03:30.997

for joining this public forum today to discuss how

00:03:30.997 --> 00:03:34.227

we can ensure good stewardship

00:03:34.227 --> 00:03:37.377

for the parks' magnificent collection of

00:03:37.377 --> 00:03:40.787

Giant Sequoia Groves that we know

00:03:40.787 --> 00:03:44.107

were key to the establishment of

00:03:44.107 --> 00:03:47.317

these parks. The Castle fire that burned

00:03:47.317 --> 00:03:50.367

through the Sequoia National Forest and through

00:03:50.367 --> 00:03:51.387

Sequoia National Park

00:03:51.417 --> 00:03:54.657

back in 2020

00:03:54.657 --> 00:03:57.827

then followed by this past season's

00:03:57.827 --> 00:04:01.037



Windy Fire and KNP Complex fires

00:04:01.037 --> 00:04:04.257

that also burned on those same federal

00:04:04.257 --> 00:04:07.577

Properties largely caused

00:04:07.577 --> 00:04:11.067

unprecedented destruction to giant sequoia groves,

00:04:11.067 --> 00:04:14.427

and this destruction is the result

00:04:14.427 --> 00:04:18.807

of unnaturally heavy accumulations of forest fuels

00:04:18.807 --> 00:04:21.047

combined with climate change driven drought.

00:04:21.507 --> 00:04:24.767

Over a number of years, that has really

00:04:24.767 --> 00:04:29.047

caused fires to burn at extraordinary intensities

00:04:29.047 --> 00:04:32.207

and some groves burned at such high

00:04:32.207 --> 00:04:35.217

intensity that large numbers of trees have

00:04:35.217 --> 00:04:38.747

been killed and at such high

00:04:38.747 --> 00:04:42.497

concentrations that we fear new sequoia seedlings



00:04:42.497 --> 00:04:46.017

will not take their place

00:04:46.017 --> 00:04:49.217

naturally to replace what was

00:04:49.217 --> 00:04:52.387

lost in these fires. So, the Park Service is proposing to

00:04:52.417 --> 00:04:57.467

plant giant sequoia seedlings in the 48-

00:04:57.467 --> 00:05:02.877

acre Board Camp Grove, which was largely decimated

00:05:02.877 --> 00:05:06.087

in the Castle fire here in Sequoia

00:05:06.087 --> 00:05:09.227

National Park. And so, we're glad to have this

00:05:09.227 --> 00:05:12.587

opportunity to brief you on what happened within

00:05:12.587 --> 00:05:16.527

this grove and our proposed plans

00:05:16.527 --> 00:05:19.817

to restore it. And so, with

00:05:19.817 --> 00:05:23.037

that, I'll kick it back over to Elly to talk a

00:05:23.037 --> 00:05:23.447

little bit more about the comment

00:05:23.747 --> 00:05:27.457



process and

00:05:27.457 --> 00:05:28.237

introduce Christy. Thank you.

00:05:28.827 --> 00:05:33.617

Absolutely.

00:05:33.617 --> 00:05:34.037

Thank you, Clay.

00:05:35.187 --> 00:05:38.277

So yes, what Clay just outlined as

00:05:38.277 --> 00:05:41.377

the purpose of this meeting is really part of an overarching

00:05:41.377 --> 00:05:44.707

effort to hear from you, the public, about our proposed

00:05:44.707 --> 00:05:46.417

action and hear from you about any concerns you may have.

00:05:48.017 --> 00:05:51.137

So, as we are in the midst of a 30-day public

00:05:51.137 --> 00:05:55.117

review plan review period on this planning opportunity

00:05:55.117 --> 00:05:58.257

and this planning effort, which is really an

00:05:58.257 --> 00:06:01.977

opportunity for the NPS to share with you, the public,

00:06:01.977 --> 00:06:05.517

our plans for trying to restore giant



00:06:05.517 --> 00:06:08.567

sequoias to Board Camp, understand any suggestions

00:06:08.567 --> 00:06:11.657

or concerns you have about the proposal, and

00:06:11.657 --> 00:06:14.667

specifically get impact information from you about things

00:06:14.667 --> 00:06:17.727

you'd like us to consider in the decision-making process. Again,

00:06:17.727 --> 00:06:18.927

thank you for your interest in this project

00:06:18.967 --> 00:06:20.647

and for taking the time to join us today.

00:06:21.317 --> 00:06:24.867

So, I'm going to hand things over now to Christy Brigham,

00:06:24.867 --> 00:06:27.957

our Chief of Resources Management and Science, who is also the Project

00:06:27.957 --> 00:06:29.387

Leader for this proposed action.

00:06:31.227 --> 00:06:34.447

Good afternoon everyone,

00:06:34.447 --> 00:06:38.367

Thank you so much for your interest in our parks and your

00:06:38.367 --> 00:06:41.477

parks and in this project. I went to a

00:06:41.477 --> 00:06:44.797



lot of public meetings with my mom when I was

00:06:44.797 --> 00:06:48.257

little so I know it's time out of your day and

00:06:48.257 --> 00:06:49.157

I really appreciate it, as we all do.

00:06:49.937 --> 00:06:53.297

So, as Clay mentioned

00:06:53.297 --> 00:06:56.927

and Elly mentioned, I'm talking about a proposed

00:06:56.927 --> 00:06:59.967

action to plant sequoia seedlings in Board Camp Grove,

00:06:59.967 --> 00:07:03.497

which is near the South Fork

00:07:03.497 --> 00:07:05.527

Campground in Sequoia National Park.

00:07:06.417 --> 00:07:10.547

So why are we doing this

00:07:10.547 --> 00:07:13.717

project? These sequoias have seen lots of fire over

00:07:13.717 --> 00:07:17.167

their lifetime; fire as frequently as every

00:07:17.167 --> 00:07:20.427

10 to 20 years, and they've been on this landscape

00:07:20.427 --> 00:07:24.847

for about 4000 years in their current configuration.



00:07:24.847 --> 00:07:28.237

And we in Sequoia and Kings Canyon, we've never had

00:07:28.237 --> 00:07:30.577

to plant sequoias after fire before.

00:07:31.117 --> 00:07:34.467

But as Clay mentioned, we are seeing a lot

00:07:34.467 --> 00:07:38.117

of changes, unfortunate changes, and as I

00:07:38.117 --> 00:07:41.497

was driving home today, I thought of that maxim when you

00:07:41.497 --> 00:07:44.667

go into a store and you see those signs

00:07:44.667 --> 00:07:47.907

that say you break it, you buy it. I

00:07:47.907 --> 00:07:48.877

I think of this project a little bit.

00:07:49.437 --> 00:07:53.487

We broke it and we have to fix it.

00:07:53.487 --> 00:07:57.057

So, the goal, the purpose and need of the project is

00:07:57.057 --> 00:08:00.087

to reestablish sequoias in this

00:08:00.087 --> 00:08:03.407

48-acre grove that has about 80 percent

00:08:03.407 --> 00:08:06.647



mortality of living trees

00:08:06.647 --> 00:08:10.527

including all the large giant sequoias in

00:08:10.527 --> 00:08:10.547

the main part of the grove.

00:08:11.107 --> 00:08:14.617

And those trees are the trees

00:08:14.617 --> 00:08:17.637

that were they not dead, would be making the future

00:08:17.637 --> 00:08:21.047

of the forest, and one of the gifts

00:08:21.047 --> 00:08:24.217

of working with giant sequoias is that it

00:08:24.217 --> 00:08:27.407

forces you to think on really long timescales.

00:08:27.407 --> 00:08:30.497

So, when we look at those trees, we're seeing

00:08:30.497 --> 00:08:34.027

2000 years into the past when they were

00:08:34.027 --> 00:08:37.667

seedlings and we are thinking 2000 years into

00:08:37.667 --> 00:08:41.047

the future. And the goal with this project is really

00:08:41.047 --> 00:08:42.417

to get sequoias back



00:08:42.457 --> 00:08:45.907

to the grove, so that as

00:08:45.907 --> 00:08:49.137

changes continue to unfold like climate change

00:08:49.137 --> 00:08:52.367

and fire and other

00:08:52.367 --> 00:08:55.627

aspects happening on the landscape, that this grove

00:08:55.627 --> 00:08:59.207

can adapt and change and has a chance

00:08:59.207 --> 00:09:02.087

to respond to those changes. So, we feel that

00:09:03.547 --> 00:09:07.117

how sequoias in our forests, in

00:09:07.117 --> 00:09:10.187

general, respond to continued wildfire and climate change,

00:09:10.187 --> 00:09:13.387

having as many groves as possible on the landscape in

00:09:13.387 --> 00:09:16.777

as many different places will allow

00:09:16.777 --> 00:09:19.787

them to respond better and be more resilient.

00:09:19.787 --> 00:09:23.217

And this restoration project also has a goal

00:09:23.217 --> 00:09:26.417



to protect the natural and cultural resources occurring in these areas.

00:09:27.337 --> 00:09:30.507

Normally a giant sequoia is, as

00:09:30.507 --> 00:09:33.727

many of you probably know, they utilize what

00:09:33.727 --> 00:09:36.767

a friend of mine, Rob York, calls a fast

00:09:36.767 --> 00:09:40.017

and furious regeneration. So,

00:09:40.017 --> 00:09:44.137

they actually regenerate very well after

00:09:44.137 --> 00:09:47.347

Fire; after low and mixed severity fire, or very small

00:09:47.347 --> 00:09:50.377

patches of high severity. And this might

00:09:50.377 --> 00:09:53.827

be what you would see. This photo was taken in Cedar

00:09:53.827 --> 00:09:56.997

Flat Grove on the way to Board Camp

00:09:56.997 --> 00:09:59.847

and shows what we like to see, which is lots of little tiny

00:09:59.907 --> 00:10:03.847

sequoia seedlings the first year after a

00:10:03.847 --> 00:10:07.777

fire. We need lots of those seedlings because a lot of them



00:10:07.777 --> 00:10:10.827

die. They aren't very big seeds

00:10:10.827 --> 00:10:13.877

and there's over 90% mortality of

00:10:13.877 --> 00:10:17.887

these little seedlings, so you need a huge amount of seedlings

00:10:17.887 --> 00:10:21.177

postfire to generate

00:10:21.177 --> 00:10:25.007

a few 100-year-old trees and then an even smaller number of

00:10:25.007 --> 00:10:28.387

1000-year-old trees and these big

00:10:28.387 --> 00:10:30.717

old trees actually are really important to sequoia.

00:10:30.797 --> 00:10:34.067

In their life cycle, some analyses

00:10:34.067 --> 00:10:37.467

of number of cones and seeds per cone and canopy

00:10:37.467 --> 00:10:40.547

size indicate that trees that are

00:10:40.547 --> 00:10:43.687

1500 years old produce

00:10:43.687 --> 00:10:46.877

the most cones and are hugely important for the

00:10:46.877 --> 00:10:50.287



future of this species. So, if we

00:10:50.287 --> 00:10:53.737

want sequoias in Board Camp Grove 100

00:10:53.737 --> 00:10:56.957

and 1000 years from now, we need a

00:10:56.957 --> 00:10:58.497

lot of seedlings out there right now.

00:10:59.307 --> 00:11:02.617

And we don't see that, so

00:11:02.617 --> 00:11:05.757

I'm showing you a map of individually mapped

00:11:05.757 --> 00:11:08.927

trees in these 4

00:11:08.927 --> 00:11:12.097

groves: Homers Nose, Board Camp, Cedar Flat, and

00:11:12.097 --> 00:11:15.107

South Fork. We've mapped all of the

00:11:15.107 --> 00:11:18.257

sequoias in our parks and

00:11:18.257 --> 00:11:21.657

red dots are trees that are dead that occurred in

00:11:21.657 --> 00:11:25.007

high severity and orange dots are in

00:11:25.007 --> 00:11:28.397

moderate severity, so some of those trees may be alive.



00:11:28.397 --> 00:11:31.477

The green dots are in low severity and likely still living.

00:11:31.507 --> 00:11:34.667

And one of the things I would like you to notice is

00:11:34.667 --> 00:11:37.687

that the green dots in Board Camp are in the

00:11:37.687 --> 00:11:40.927

bottom of the grove, which makes it even

00:11:40.927 --> 00:11:44.377

more difficult for those trees to produce

00:11:44.377 --> 00:11:47.487

seeds that move up into the grove

00:11:47.487 --> 00:11:50.547

and regenerate the grove. So, as

00:11:50.547 --> 00:11:53.807

our Superintendent, Clay Jordan mentioned in terms of the

00:11:53.807 --> 00:11:54.957

we broke it issue,

00:11:56.337 --> 00:11:59.627

we have suppressed a lot of naturally

00:11:59.627 --> 00:12:02.747

caused lightning fires in these areas

00:12:02.747 --> 00:12:05.837

because of conditions and worries about

00:12:05.837 --> 00:12:09.437



we don't want fire to burn into our communities,

00:12:09.437 --> 00:12:12.657

and so we've really reduced the amount of fire on

00:12:12.657 --> 00:12:15.677

our landscape and that has resulted in more

00:12:15.677 --> 00:12:18.707

dense forests. And when you overlay onto

00:12:18.707 --> 00:12:22.007

that density, hot droughts that have a climate

00:12:22.007 --> 00:12:25.137

change signal, you get a lot of tree mortality and

00:12:25.137 --> 00:12:26.787

you get a lot of fuels. And those fuels

00:12:26.947 --> 00:12:30.277

are changing the way fire burns in

00:12:30.277 --> 00:12:33.697

these areas. We've never seen mortality

00:12:33.697 --> 00:12:37.167

like this in sequoias post wildfire.

00:12:37.167 --> 00:12:40.627

And in fact, though you have to go back

00:12:40.627 --> 00:12:44.627

to 1297 to find an event that

00:12:44.627 --> 00:12:48.067

through fire history records appears to have



00:12:48.067 --> 00:12:52.477

killed over a dozen sequoias. So, really

00:12:52.477 --> 00:12:56.977

unprecedented effects and Board Camp particularly hard hit.

00:12:59.057 --> 00:13:02.147

I went to the grove once in April and once

00:13:02.147 --> 00:13:06.417

in October. In April, I saw no seedlings.

00:13:06.417 --> 00:13:09.807

None. And very few cones, and very few

00:13:09.807 --> 00:13:12.967

Seeds. And in October, very

00:13:12.967 --> 00:13:16.297

Patchy, small amount of regeneration, mainly

00:13:16.297 --> 00:13:19.727

in that southern end, and then

00:13:19.727 --> 00:13:23.067

surveys that were done in similar areas

00:13:23.067 --> 00:13:27.047

on the Forest Service are also finding very little

00:13:27.047 --> 00:13:29.377

regeneration in many high severity areas: about

00:13:29.407 --> 00:13:32.527

83 seedlings per hectare, when typically

00:13:32.527 --> 00:13:35.887



after a prescribed fire, we'd seen 90,000 seedlings

00:13:35.887 --> 00:13:39.397

per hectare, and in a lot of those

00:13:39.397 --> 00:13:40.727

surveys, the median value was zero.

00:13:41.827 --> 00:13:45.147

OK, let's see if my

00:13:46.347 --> 00:13:49.557

technology experiment will work

00:13:49.557 --> 00:13:52.577

here. So, bear with me, I want to

00:13:52.577 --> 00:13:53.267

show you

00:13:53.957 --> 00:13:57.807

some aerial

00:13:57.807 --> 00:14:01.207

footage of the fire effects, so that you can see

00:14:01.897 --> 00:14:04.407

what I am talking about.

00:14:07.547 --> 00:14:08.217

So,

00:14:09.317 --> 00:14:12.407

hopefully along with

00:14:12.407 --> 00:14:15.807

some digital delays, you are now seeing



00:14:15.807 --> 00:14:19.697

a screen that says, Garfield Grove, Sequoia National

00:14:19.697 --> 00:14:22.847

Park. This is helicopter and drone

00:14:22.847 --> 00:14:26.117

footage flying over Garfield Grove, which burned

00:14:26.117 --> 00:14:29.367

at low severity and you can see all these green

00:14:29.367 --> 00:14:32.547

trees. So those are a lot of sequoias there. The broccoli

00:14:32.547 --> 00:14:36.037

tops. This is good fire, and we still have trees

00:14:36.037 --> 00:14:39.137

there to make seedlings and to continue the

00:14:39.137 --> 00:14:39.887

future of that growth.

00:14:40.167 --> 00:14:43.377

Now we're going to fly over Board Camp,

00:14:43.377 --> 00:14:47.067

where we're proposing restoration, and you can see these

00:14:47.067 --> 00:14:50.087

all these black sticks and the ones with

00:14:50.087 --> 00:14:53.607

fat bases. Those are large sequoias, so you

00:14:53.607 --> 00:14:56.817



can see it's very steep and there's

00:14:56.817 --> 00:14:59.947

almost no living trees left in

00:14:59.947 --> 00:15:03.517

that grove so, very

00:15:03.517 --> 00:15:07.217

very challenging conditions there for our sequoias.

00:15:07.777 --> 00:15:11.477

So, I'm now going to go back to

00:15:11.477 --> 00:15:11.747

our PowerPoint.

00:15:13.737 --> 00:15:17.147

Thank you for your patience.

00:15:17.797 --> 00:15:20.867

I just wanted to

00:15:20.867 --> 00:15:24.207

show you some pictures, so you get a feel

00:15:24.207 --> 00:15:27.857

for why we're proposing this project. I really

00:15:27.857 --> 00:15:31.057

wish that this growth would recover on its own.

00:15:31.057 --> 00:15:34.117

That is, by far, our preference in the

00:15:34.117 --> 00:15:37.297

park in a wilderness area like this one



00:15:37.297 --> 00:15:40.307

is to let natural processes occur

00:15:40.307 --> 00:15:43.527

and work with nature, but we're facing

00:15:43.527 --> 00:15:46.957

a very difficult situation here. So, these first

00:15:46.957 --> 00:15:48.087

few photos are from April,

00:15:48.117 --> 00:15:50.927

when I went out there.

00:15:54.187 --> 00:15:58.147

So you can see, I just wanted you to see the

00:15:58.147 --> 00:16:01.467

bare ground and the lack of vegetation of any kind

00:16:01.467 --> 00:16:05.837

and that you don't see, normally we would see huge piles of

00:16:05.837 --> 00:16:09.247

cones. You can see a little bit of greenery coming in, you see

00:16:09.247 --> 00:16:12.627

the dead trees. This is from October in

00:16:12.627 --> 00:16:16.047

the southern end of the grove, where we went to collect

00:16:16.047 --> 00:16:19.637

cones for this reforestation effort, and there

00:16:19.637 --> 00:16:22.647



are seedlings, so I don't want to give the impression that there

00:16:22.647 --> 00:16:24.597

are no seedlings. There are a few

00:16:24.637 --> 00:16:27.777

seedlings in these areas, but not

00:16:27.777 --> 00:16:31.047

enough to generate the future forest.

00:16:31.047 --> 00:16:34.107

There are some beautiful cones. So, what

00:16:34.107 --> 00:16:34.487

are we proposing?

00:16:35.807 --> 00:16:38.817

We have collected cones from Board Camp,

00:16:38.817 --> 00:16:42.117

Cedar Flat, and Garfield Grove. We are working

00:16:42.117 --> 00:16:45.937

with two different growers to produce 12,000

00:16:45.937 --> 00:16:49.077

sequoia seedlings that we are hoping to

00:16:49.077 --> 00:16:52.287

plant this October, with

00:16:52.287 --> 00:16:55.457

more planting in the following October of 2023,

00:16:55.457 --> 00:16:58.647

depending on survivorship. The site



00:16:58.647 --> 00:17:02.117

preparation will be just digging small holes

00:17:02.117 --> 00:17:05.177

for these seedlings and building a watering basin around them,

00:17:05.177 --> 00:17:06.237

as it is in wilderness.

00:17:06.267 --> 00:17:10.297

It's very difficult to get to, so there will not

00:17:10.297 --> 00:17:13.507

be watering or weeding, or what we call "aftercare"

00:17:13.507 --> 00:17:16.617

in the planting world right now. The planting

00:17:16.617 --> 00:17:19.697

density is around 250 seedlings

00:17:19.697 --> 00:17:23.017

per acre, and those numbers can be adjusted, depending

00:17:23.017 --> 00:17:26.237

on what we see in the field, and this will not

00:17:26.237 --> 00:17:29.657

be pines in lines. It will not look like

00:17:29.657 --> 00:17:33.627

a tree farm. The seedlings will be put in small areas

00:17:33.627 --> 00:17:36.227

along contours and 25%

00:17:36.257 --> 00:17:39.847



of the total seedlings will be from

00:17:39.847 --> 00:17:42.907

genetic material from cones collected from other

00:17:42.907 --> 00:17:46.267

groves, but not Board Camp, and the

00:17:46.267 --> 00:17:49.487

goal of that is to increase the genetic diversity of the

00:17:49.487 --> 00:17:53.507

planting and to also include some

00:17:53.507 --> 00:17:55.587

seeds from groves that are hotter and drier.

00:17:56.917 --> 00:17:59.937

A little more detail for those of you

00:17:59.937 --> 00:18:03.227

who like to nerd out on this sort of thing:

00:18:03.227 --> 00:18:06.287

the non-local groves that

00:18:06.287 --> 00:18:09.387

we're proposing to include, include

00:18:09.387 --> 00:18:12.517

seeds from Giant Forest, Pack Saddle Grove,

00:18:12.517 --> 00:18:16.067

Black Mountain Grove, Big Stump Grove, Peyrone

00:18:16.067 --> 00:18:19.867

Grove, Long Meadow Grove, Redwood Mountain Grove, and Mountain



00:18:19.867 --> 00:18:23.047

Home. Those are, they're all in the southern

00:18:23.047 --> 00:18:26.207

part of the range, and information from Doctor Rainbow

00:18:28.507 --> 00:18:31.877

on their environmental conditions indicate

00:18:31.877 --> 00:18:35.327

that they have high genetic diversity and that

00:18:35.327 --> 00:18:38.667

some of these groves currently occur in hotter and drier

00:18:38.667 --> 00:18:42.397

conditions, which we think is the future of

00:18:42.397 --> 00:18:45.457

this area. We're growing them to Styro 6 is

00:18:45.457 --> 00:18:48.527

the proposal, which is a specific

00:18:48.527 --> 00:18:51.697

smallish size 6 to 8 inches, with a

00:18:51.697 --> 00:18:54.907

6 milliliter plug, and as I

00:18:54.907 --> 00:18:58.127

said, planting 12,000 seedlings in October of

00:18:58.127 --> 00:18:59.017

2022 is the proposal.

00:18:59.857 --> 00:19:02.887



We want to do this after the summer drought

00:19:02.887 --> 00:19:06.087

but before the snow. Since we can't water, we will

00:19:06.087 --> 00:19:10.347

be tracking survivorship. This is a huge

00:19:10.347 --> 00:19:13.807

effort and it is very far in wilderness, so we really need to do

00:19:13.807 --> 00:19:17.187

it as a surge. So, we have 20 to 30 people

00:19:17.187 --> 00:19:20.567

helping us that will be hiking out and backpacking

00:19:20.567 --> 00:19:23.917

and camping near the grove

00:19:23.917 --> 00:19:27.717

to get the help to get the seedlings and the

00:19:27.717 --> 00:19:31.067

tools, hand tools there and we will be using sling loads

00:19:31.107 --> 00:19:32.377

with a helicopter.

00:19:33.817 --> 00:19:34.167

So.

00:19:34.907 --> 00:19:37.937

And then we will, like I said, monitor

00:19:37.937 --> 00:19:41.187

survivorship. We want to learn as much as we can from this



00:19:41.187 --> 00:19:44.337

project. Already mentioned the planting

00:19:44.337 --> 00:19:47.427

density and we will be keeping track of

00:19:47.427 --> 00:19:50.757

exactly where the non-Board Camp trees are,

00:19:50.757 --> 00:19:54.087

just in case. It takes about 30 to 60

00:19:54.087 --> 00:19:57.337

years for a sequoia to produce viable seed,

00:19:57.337 --> 00:20:00.647

and so that gives us a window to look at to see how

00:20:00.647 --> 00:20:03.817

those trees are doing and assess whether we see any

00:20:03.817 --> 00:20:04.977

Problems, without

00:20:05.037 --> 00:20:08.337

messing up the genetics of that grove,

00:20:08.337 --> 00:20:11.227

if we feel like that was a terrible idea.

00:20:12.237 --> 00:20:16.757

Just to be transparent about some of the

00:20:16.757 --> 00:20:19.957

uncertainty. What if the seedlings don't establish? We

00:20:19.957 --> 00:20:23.117



expect them to come. Like I said, there has not

00:20:23.117 --> 00:20:26.207

been large scale planting postfire

00:20:26.207 --> 00:20:29.857

but Mountain Home and Sierra Pacific Industries

00:20:29.857 --> 00:20:32.897

have done a lot of sequoia plantings

00:20:32.897 --> 00:20:36.077

after logging, and actually, sequoia groves and

00:20:36.077 --> 00:20:39.467

forestry installations are common in

00:20:39.467 --> 00:20:42.147

New Zealand and in botanical gardens.

00:20:42.247 --> 00:20:45.597

So, we think they will do fine, but this is a

00:20:45.597 --> 00:20:48.677

wilderness area, and if we do not

00:20:48.677 --> 00:20:51.747

have success in a reasonable time frame,

00:20:51.747 --> 00:20:54.907

say five years, then we'll stop. This isn't a

00:20:54.907 --> 00:20:57.937

garden, it's not a Botanic Garden, it's a wilderness area

00:20:57.937 --> 00:21:01.037

in a National Park. Similarly, we



00:21:01.037 --> 00:21:01.437

will be tracking

00:21:02.127 --> 00:21:05.577

these seeds that come from places like

00:21:05.577 --> 00:21:08.837

Giant Forest. We don't expect any negative outcomes

00:21:08.837 --> 00:21:12.017

from that, but better to keep track

00:21:12.017 --> 00:21:15.097

and have a plan to remove them if something unexpected happens.

00:21:16.067 --> 00:21:20.047

And then I did want to mention some other

00:21:20.047 --> 00:21:23.347

work that's ongoing that is not part of this

00:21:23.347 --> 00:21:26.567

project, but could benefit and is associated.

00:21:26.567 --> 00:21:30.027

So, I'm working with Doctor Michelle Geary on studies of

00:21:30.027 --> 00:21:33.297

the seedling environment, and how that

00:21:33.297 --> 00:21:36.697

might be different in small patches in low severity fire

00:21:36.697 --> 00:21:40.057

versus these large high severity openings, trying to

00:21:40.057 --> 00:21:43.267



learn from that how conditions are changing. We are

00:21:43.267 --> 00:21:46.517

looking at after the KNP,

00:21:46.517 --> 00:21:48.237

where conditions might be beneficial

00:21:48.277 --> 00:21:51.527

for sequoia under climate

00:21:51.527 --> 00:21:54.927

Change. We are working on assessing fuel loads and the

00:21:54.927 --> 00:21:58.357

threats of high severity fire in a reburn in

00:21:58.357 --> 00:22:02.307

some of these areas, and for areas that burned at low and moderate

00:22:02.307 --> 00:22:05.717

severity. Because re-burning, burning again, at high severity

00:22:05.717 --> 00:22:09.057

is a driver of loss of forest cover of what we call

00:22:09.057 --> 00:22:09.207

type conversion.

00:22:10.137 --> 00:22:13.237

We also, unfortunately,

00:22:13.237 --> 00:22:16.367

under the KNP fire, have another large area

00:22:16.367 --> 00:22:19.627

that burned at high severity in Redwood Mountain Grove



00:22:19.627 --> 00:22:24.007

that we are considering for restoration, and this work will

00:22:24.007 --> 00:22:27.067

inform that project. We are also looking at some

00:22:27.067 --> 00:22:30.357

areas of mixed conifer that burned at high severity

00:22:30.357 --> 00:22:32.767

that also may experience regeneration failure.

00:22:33.577 --> 00:22:36.937

And that is the end

00:22:36.937 --> 00:22:37.347

of my presentation.

00:22:38.147 --> 00:22:43.687

Thank

00:22:43.687 --> 00:22:43.997

you, Christy.

00:22:45.187 --> 00:22:48.587

I'm going to go ahead

00:22:48.587 --> 00:22:51.597

and read Q&A. I have received a few

00:22:51.597 --> 00:22:55.047

questions in our live event Q&A

00:22:55.047 --> 00:22:58.257

section, so if you are an attendee and you have any

00:22:58.257 --> 00:23:01.517



questions for Christy or for myself

00:23:01.517 --> 00:23:04.607

or Elly or Clay, the

00:23:04.607 --> 00:23:07.767

Superintendent, or any of us in the Park Service here about this

00:23:07.767 --> 00:23:11.687

project, feel free to put them in the Question and Answer section.

00:23:11.687 --> 00:23:15.327

I recognize there's a little bit of a delay, so I'm gonna talk for a little bit here

00:23:15.327 --> 00:23:15.517

before I begin.

00:23:15.557 --> 00:23:18.657

The first one, when I read

00:23:18.657 --> 00:23:21.667

the first question that I get, I will just go in

00:23:21.667 --> 00:23:25.227

order and I will publish them as I see them in

00:23:25.227 --> 00:23:28.607

the chat, and we'll try to go through each one and

00:23:28.607 --> 00:23:32.267

answer them as we go. And then if

00:23:32.267 --> 00:23:35.347

there's for some reason more questions than we have time to

00:23:35.347 --> 00:23:38.467

answer today, then I will go ahead



00:23:38.467 --> 00:23:41.767

and compile those questions, and we'll find answers, and we will

00:23:41.767 --> 00:23:45.247

publish those to the public PEPC page where you found this link.

00:23:46.867 --> 00:23:50.427

So, I think I will

00:23:50.427 --> 00:23:53.577

go ahead and read the first question.

00:23:53.577 --> 00:23:56.937

And just to reiterate, I put it in the chat as well, but to

00:23:56.937 --> 00:24:00.487

submit a question or comment you should see a little icon

00:24:00.487 --> 00:24:03.697

up in the top that has a question

00:24:03.697 --> 00:24:06.957

mark on it. If you click on that, then you can type into

00:24:06.957 --> 00:24:07.837

the field and then there's sort of a little

00:24:09.177 --> 00:24:10.157

flying envelope

00:24:11.707 --> 00:24:15.357

arrow that you can hit to push submit, and then it'll come

00:24:15.357 --> 00:24:16.437

into the Q&A.

00:24:17.597 --> 00:24:21.187



So, the 1st

00:24:21.187 --> 00:24:21.757

question is

00:24:22.457 --> 00:24:26.307

for Christy: Will

00:24:26.307 --> 00:24:29.607

the Park Service please provide GIS

00:24:29.607 --> 00:24:33.167

data of burn severity for the entire

00:24:33.167 --> 00:24:36.667

fire? And then it's clarified: just to be clear,

00:24:36.667 --> 00:24:39.717

both Castle and KNP Complex

00:24:39.717 --> 00:24:39.967

fires?

00:24:42.077 --> 00:24:45.727

Great thanks, thanks Russell, a

00:24:45.727 --> 00:24:49.027

couple clarifications. So, we're happy to provide

00:24:49.027 --> 00:24:52.137

that data.

00:24:52.137 --> 00:24:55.167

GIS data is incredibly data

00:24:55.167 --> 00:24:58.227

intensive, so you can't really email it.



00:24:58.227 --> 00:25:01.247

But, if you reach out to Paul Hardwick and me, we will

00:25:01.247 --> 00:25:04.447

also put this in our answers and

00:25:04.447 --> 00:25:06.787

post at nps.gov.

00:25:07.507 --> 00:25:10.997

He is our GIS Branch Chief, and he'd

00:25:10.997 --> 00:25:14.277

be happy to provide that information for the

00:25:14.277 --> 00:25:17.467

NPS lands. So, the Forest Service

00:25:17.467 --> 00:25:20.567

did their own Burned Area Emergency Response

00:25:20.567 --> 00:25:23.067

plan and has the fire severity for their properties.

00:25:27.257 --> 00:25:30.337

I will note, Christy, just to add

00:25:30.337 --> 00:25:33.487

to that, if it's possible for us to add that to

00:25:33.487 --> 00:25:36.777

the project website, we will do so. That I will also

00:25:36.777 --> 00:25:39.317

look into that as well, so it's not just up incumbent upon you to

00:25:40.267 --> 00:25:43.377



get it from Paul, but we'll try to make it available if

00:25:43.377 --> 00:25:45.857

it fits the bandwidth requirements there.

00:25:46.777 --> 00:25:47.567

Thank you, Christy.

00:25:48.977 --> 00:25:56.677

OK

00:25:56.677 --> 00:25:58.207

Time for the next question.

00:25:59.517 --> 00:26:02.817

This is also for Christy, so I'm going to keep you on

00:26:02.817 --> 00:26:04.417

the screen here, Christy.

00:26:05.797 --> 00:26:09.197

Is the drought affecting

00:26:09.197 --> 00:26:12.487

regeneration? In other words, could the lack of regeneration

00:26:12.487 --> 00:26:15.807

be related to lack of snow rather than the severity of

00:26:15.807 --> 00:26:15.877

the fire?

00:26:16.717 --> 00:26:20.077

That's a great question

00:26:20.077 --> 00:26:21.607

and it certainly could be.



00:26:22.817 --> 00:26:25.977

There's two ways that we look

00:26:25.977 --> 00:26:26.107

at that.

00:26:27.677 --> 00:26:31.017

The first is if you have

00:26:31.017 --> 00:26:34.227

abundant seed. So, what happens in a

00:26:34.227 --> 00:26:37.377

fire is that the heat goes into the canopy and opens the

00:26:37.377 --> 00:26:40.587

cones and the seeds fall to the ground and

00:26:40.587 --> 00:26:43.747

then they germinate, and in a drought,

00:26:43.747 --> 00:26:46.837

then they die. So, if

00:26:46.837 --> 00:26:50.417

we had gone in April and seen lots of seeds

00:26:50.417 --> 00:26:53.727

on the ground and seedlings like we saw in

00:26:53.727 --> 00:26:56.767

Cedar Flat, and lots of intact cones,

00:26:58.167 --> 00:27:01.507

if they had all been dead, that would be an

00:27:01.507 --> 00:27:04.777



indication that the impact is drought, not fire.

00:27:04.777 --> 00:27:07.927

The other piece of that is that when

00:27:07.927 --> 00:27:11.327

the adult trees are still alive, sequoia has

00:27:11.327 --> 00:27:14.397

lived thousands of years, right? And so, if we have

00:27:14.397 --> 00:27:17.677

one or two fires where after the fire, there's a

00:27:17.677 --> 00:27:21.217

drought, and there's not good survivorship, that's

00:27:21.217 --> 00:27:24.357

OK, because the adults are still there to make more cones

00:27:24.357 --> 00:27:27.417

and to try again at the next fire. The issue

00:27:27.417 --> 00:27:29.757

here with these groves that have burned at high severity

00:27:29.787 --> 00:27:33.237

is that all the adults are dead.

00:27:33.237 --> 00:27:36.597

So, if we don't get a strong seedling

00:27:36.597 --> 00:27:40.667

crop in the first year after fire, there isn't another

00:27:40.667 --> 00:27:43.737

chance, so we don't have good seedlings, we



00:27:43.737 --> 00:27:46.837

did not see, when we went in April, a lot

00:27:46.837 --> 00:27:49.877

of seeds and seedlings. So, indications

00:27:49.877 --> 00:27:53.297

are that it is fire, not drought by

00:27:53.297 --> 00:27:53.397

itself.

00:27:53.657 --> 00:27:56.707

And then without adults, there is

00:27:56.707 --> 00:27:58.027

the need for active intervention.

00:28:03.057 --> 00:28:07.067

Thank you, Christy. I have a few more questions for you,

00:28:07.067 --> 00:28:10.357

So, I'm gonna keep you on there, if that's OK. The

00:28:10.357 --> 00:28:14.217

next question says: Save the Redwoods League

00:28:14.217 --> 00:28:17.537

supports a decision to replant sequoia in Board

00:28:17.537 --> 00:28:20.617

Camp given the abnormal amount of high

00:28:20.617 --> 00:28:24.047

severity fire. We are encouraged to see you mention the work of Doctor

00:28:24.047 --> 00:28:27.667



Rob York from UC Berkeley. Doctor York's

00:28:27.667 --> 00:28:32.137

research on sequoia reforestation suggests not only

00:28:32.137 --> 00:28:33.417

replanting, but replanting with a highly robust

00:28:33.447 --> 00:28:36.707

strategy in high severity impacted

00:28:36.707 --> 00:28:40.477

groves like Board Camp. Have you taken into account Doctor

00:28:40.477 --> 00:28:43.067

York's research in deciding the amount of seedlings to plant?

00:28:44.207 --> 00:28:48.467

That's a great question. The current

00:28:48.467 --> 00:28:51.587

density proposal of 250 per acre is based

00:28:51.587 --> 00:28:55.017

on some other reforestation

00:28:55.017 --> 00:28:59.617

specifications, some of which are targeted at giant sequoia.

00:28:59.617 --> 00:29:02.957

What we heard from Doctor York just

00:29:02.957 --> 00:29:06.117

last week was that the density that you plant

00:29:06.117 --> 00:29:09.387

should depend on whether you are going to



00:29:09.387 --> 00:29:12.767

try and keep fire out of your

00:29:12.767 --> 00:29:14.297

growth for 15 to 20 years

00:29:14.357 --> 00:29:17.677

or whether you are going to allow

00:29:17.677 --> 00:29:20.827

fire to come back through and thin out the stand.

00:29:20.827 --> 00:29:23.877

So, we will definitely be considering that

00:29:23.877 --> 00:29:27.167

when we look at what we do in 2022,

00:29:27.167 --> 00:29:31.147

and the other piece of that puzzle is that I've also

00:29:31.147 --> 00:29:34.197

asked Doctor Nate Stephenson, one of the

00:29:34.197 --> 00:29:37.587

world's leading sequoia experts to use

00:29:37.587 --> 00:29:40.617

his survivorship and life history

00:29:40.617 --> 00:29:43.967

life table estimates to also help

00:29:43.967 --> 00:29:44.727

us refine our planting density.

00:29:44.767 --> 00:29:47.957



So, as we get year

00:29:47.957 --> 00:29:51.067

one under our belts and look at what to do in year two,

00:29:51.067 --> 00:29:54.577

and work with our fuels specialists to

00:29:54.577 --> 00:29:57.647

consider treatments outside the grove

00:29:57.647 --> 00:30:00.927

in terms of keeping out fire or letting fire back

00:30:00.927 --> 00:30:03.397

in, we will definitely be considering Rob's data.

00:30:06.607 --> 00:30:09.817

Thanks, Christy. The next question

00:30:09.817 --> 00:30:13.177

is also for you. What is your

00:30:13.177 --> 00:30:16.187

rationale for entering an official wilderness area for

00:30:16.187 --> 00:30:17.557

a restoration project?

00:30:18.857 --> 00:30:22.227

That's a great question, and we

00:30:22.227 --> 00:30:25.837

are really very committed to wilderness stewardship

00:30:25.837 --> 00:30:29.407

and to using our enabling legislation



00:30:29.407 --> 00:30:32.887

and our wilderness stewardship plan and

00:30:32.887 --> 00:30:36.347

Minimum Requirements Analysis to decide

00:30:36.347 --> 00:30:39.517

what projects to do or not do in

00:30:39.517 --> 00:30:42.997

wilderness. The National Park Service, and the

00:30:42.997 --> 00:30:46.167

wilderness experts that support us, have been

00:30:46.167 --> 00:30:48.767

thinking about restoration in wilderness

00:30:48.987 --> 00:30:52.697

for over a decade and

00:30:52.697 --> 00:30:55.787

considering issues like climate change and

00:30:55.787 --> 00:30:58.927

fire suppression and dams

00:30:58.927 --> 00:31:02.087

and other human impacts that have

00:31:02.087 --> 00:31:05.707

changed the wilderness functioning, and those

00:31:05.707 --> 00:31:08.997

considerations go into our thought process

00:31:08.997 --> 00:31:12.507



when we propose whether to take an action

00:31:12.507 --> 00:31:15.947

in wilderness. In working with our

00:31:15.947 --> 00:31:17.957

Wilderness Manager, Erik Frenzel, our

00:31:18.917 --> 00:31:22.637

Wilderness Specialist, we talked a lot

00:31:22.637 --> 00:31:25.797

about giant sequoias and their prominence

00:31:25.797 --> 00:31:29.677

in the enabling legislation for Sequoia National Park

00:31:29.677 --> 00:31:33.687

and that puts a special

00:31:33.687 --> 00:31:37.557

onus on us in terms of the care and stewardship that we

00:31:37.557 --> 00:31:40.667

provide to this species. We also talked a

00:31:40.667 --> 00:31:41.037

lot about

00:31:42.497 --> 00:31:45.937

the unnatural fire and the desire

00:31:45.937 --> 00:31:48.987

to have a more

00:31:48.987 --> 00:31:52.437

natural fire regime. And we talked about limiting



00:31:52.437 --> 00:31:55.827

our intervention that this is not an unlimited intervention.

00:31:55.827 --> 00:31:58.957

It is a course correction

00:31:58.957 --> 00:32:02.367

to try and fix what we broke

00:32:02.367 --> 00:32:05.947

up and we have also really considered what

00:32:05.947 --> 00:32:08.967

is the minimum tool. We are not flying in the crews.

00:32:08.967 --> 00:32:12.127

Everybody's gotta walk. We're not flying out to

00:32:12.127 --> 00:32:12.647

water every week.

00:32:12.867 --> 00:32:15.887

We're really trying to do this

00:32:15.887 --> 00:32:19.837

in a way that is thoughtful and respectful to

00:32:19.837 --> 00:32:22.877

the wilderness status of this area, but

00:32:22.877 --> 00:32:26.177

also maintains the wilderness character and

00:32:26.177 --> 00:32:28.957

the critical features present in our enabling legislation.

00:32:32.837 --> 00:32:36.157



Thank you, Christy. I have another question

00:32:36.157 --> 00:32:39.167

for you: There is a

00:32:39.167 --> 00:32:43.177

a considerable amount of fear that this will not regenerate naturally.

00:32:43.177 --> 00:32:46.267

However, this is still an unknown, as it is so soon

00:32:46.267 --> 00:32:49.477

after the fire. Why not wait? Is there

00:32:49.477 --> 00:32:52.487

also a plan to have control plots to compare the natural

00:32:52.487 --> 00:32:54.667

regeneration versus the planted regeneration?

00:32:55.917 --> 00:32:59.367

Great questions, I really appreciate all

00:32:59.367 --> 00:33:00.527

the thoughtful input.

00:33:01.447 --> 00:33:04.557

So that is, so, why

00:33:04.557 --> 00:33:07.617

am I out there collecting cones? And why do I

00:33:07.617 --> 00:33:10.867

want to do this right away and the reason

00:33:10.867 --> 00:33:14.317

goes back to trying to work in concert



00:33:14.317 --> 00:33:17.537

with the life history of these trees. So,

00:33:17.537 --> 00:33:20.667

I mentioned the fast and furious analogy and

00:33:20.667 --> 00:33:23.897

that is really how sequoias operate; they

00:33:23.897 --> 00:33:25.057

Actually, under a normal condition,

00:33:25.747 --> 00:33:29.037

the seedlings do very well in the

00:33:29.037 --> 00:33:32.297

post immediate post fire environments. They benefit from

00:33:32.297 --> 00:33:35.777

the canopy opening that occurs from small patches about

00:33:35.777 --> 00:33:39.177

one acre to four acres

00:33:39.177 --> 00:33:42.367

of canopy opening. That happens in wildfire, they

00:33:42.367 --> 00:33:45.447

like bare mineral soil. The seedlings do best in bare

00:33:45.447 --> 00:33:49.417

mineral soil and so there really

00:33:49.417 --> 00:33:52.617

is a window of opportunity, and the longer

00:33:52.617 --> 00:33:55.897



you wait, the further you are away from

00:33:55.897 --> 00:33:56.717

the preferred conditions

00:33:56.747 --> 00:34:00.077

of the seedlings, and the more you

00:34:00.077 --> 00:34:00.317

have to

00:34:02.557 --> 00:34:05.787

wrestle with things like

00:34:05.787 --> 00:34:09.097

shrub competition, canopy

00:34:09.097 --> 00:34:12.847

Closure. So, we're really trying

00:34:12.847 --> 00:34:16.507

to utilize the same window that these trees

00:34:16.507 --> 00:34:19.747

would be utilizing themselves if they had not been

00:34:19.747 --> 00:34:21.287

killed in this devastating wildfire.

00:34:23.577 --> 00:34:26.887

And then the control: in

00:34:26.887 --> 00:34:30.467

the Park Service the whole the whole world is a

00:34:30.467 --> 00:34:33.567

control. So, we have, there will certainly be areas in



00:34:33.567 --> 00:34:37.897

Board Camp that we will not be planting seedlings that we can

00:34:37.897 --> 00:34:41.177

monitor and we will also monitor the natural, the

00:34:41.177 --> 00:34:44.247

small amount of natural regeneration that's occurring, and

00:34:44.247 --> 00:34:47.317

there are plenty of other

00:34:47.317 --> 00:34:50.757

areas, smaller areas that burned at high severity that we can

00:34:50.757 --> 00:34:53.207

also use as a way to look at

00:34:53.607 --> 00:34:56.987

what would have happened under the

00:34:56.987 --> 00:34:57.317

No action alternative.

00:35:01.147 --> 00:35:04.497

Great, thanks Christy, there's one

00:35:04.497 --> 00:35:07.827

more comment here from someone that said: This is very

00:35:07.827 --> 00:35:11.187

informative and a well-organized presentation, and they said thank you,

00:35:11.187 --> 00:35:11.437

So, there's that.

00:35:12.617 --> 00:35:15.827



Thought I'd pass that along. And then there's

00:35:15.827 --> 00:35:18.907

another question for you: What will be

00:35:18.907 --> 00:35:21.917

the natural vegetative succession here, if any?

00:35:23.197 --> 00:35:26.407

So, let me

00:35:26.407 --> 00:35:29.757

give two answers to that. One under no

00:35:29.757 --> 00:35:32.707

action alternative and then our proposed action.

00:35:34.397 --> 00:35:37.477

What we have seen,

00:35:37.477 --> 00:35:40.627

not in sequoia groves, but in some other areas

00:35:40.627 --> 00:35:43.777

of mixed conifer that have burned at

00:35:43.777 --> 00:35:47.047

high severity recently, is that

00:35:47.047 --> 00:35:50.217

in large areas that have exceeded the

00:35:50.217 --> 00:35:53.407

dispersal distance for the trees, you can lose

00:35:53.407 --> 00:35:56.527

the forest cover and convert to a shrub system. So,



00:35:57.877 --> 00:36:01.427

it could be that without any

00:36:01.427 --> 00:36:04.927

Action, we would get back a shrub, a big

00:36:04.927 --> 00:36:07.947

48-acre shrub patch

00:36:07.947 --> 00:36:11.367

which would be native shrubs. There are worse fates

00:36:11.367 --> 00:36:14.607

on Earth. It could also be that from

00:36:14.607 --> 00:36:17.787

around the edges you would get infill from

00:36:17.787 --> 00:36:21.087

white fur and some other species that might be

00:36:21.087 --> 00:36:24.197

better able to disperse than our giant sequoias

00:36:24.197 --> 00:36:28.087

But based on what we're seeing in the field in terms of

00:36:28.087 --> 00:36:28.707

sequoia densities,

00:36:28.857 --> 00:36:32.067

we are very confident that in the main body

00:36:32.067 --> 00:36:35.227

of the grove, you would not have sequoias

00:36:35.227 --> 00:36:38.987



and that is what we are trying to achieve through our

00:36:38.987 --> 00:36:42.387

action is to bring back the presence

00:36:42.387 --> 00:36:44.147

of giant sequoias into that area.

00:36:47.347 --> 00:36:50.527

Thanks, Christy. I think you touched on this a little bit

00:36:50.527 --> 00:36:53.767

But: Is Board Camp a grove that experts believe

00:36:53.767 --> 00:36:56.827

would have been likely to survive the hotter

00:36:56.827 --> 00:37:00.197

drier conditions expected from climate change absent

00:37:00.197 --> 00:37:02.117

catastrophic fire, and is Redwood Mountain Grove?

00:37:03.377 --> 00:37:06.767

That's a great question, and we don't really

00:37:06.767 --> 00:37:09.877

know the answer to that. And I say that for

00:37:09.877 --> 00:37:13.217

a couple reasons. You can look at sort

00:37:13.217 --> 00:37:16.257

of the mean invert climatic

00:37:16.257 --> 00:37:19.617

condition for where a grove is located in terms of



00:37:19.617 --> 00:37:22.777

temperature and precip, but that doesn't tell you what

00:37:22.777 --> 00:37:26.287

the trees have access to underground, and we're

00:37:26.287 --> 00:37:29.607

Learning that may be a critical component of what trees

00:37:29.607 --> 00:37:32.757

do well in drought and what trees don't do

00:37:32.757 --> 00:37:33.007

so well.

00:37:33.527 --> 00:37:36.737

And so, within any grove, you get a

00:37:36.737 --> 00:37:40.337

lot of variability within microsites.

00:37:40.337 --> 00:37:43.887

The other piece of the puzzle that's unknown

00:37:43.887 --> 00:37:46.947

is we look at these trees; they're 2000 years

00:37:46.947 --> 00:37:50.087

old, they've been in these grove footprints for two

00:37:50.087 --> 00:37:53.777

to three generations, so 4000 to 6000 years, and

00:37:53.777 --> 00:37:56.847

during that time the climate changed, right? It's been hotter

00:37:56.847 --> 00:38:00.197



and drier at times. It's been colder and wetter at times and

00:38:00.197 --> 00:38:03.207

the trees have persisted, so their

00:38:03.207 --> 00:38:03.917

ability to persist

00:38:03.947 --> 00:38:07.857

under climate change, I think is quite substantial

00:38:07.857 --> 00:38:11.417

and we also don't know about biotic

00:38:11.417 --> 00:38:14.527

interactions and how the climate will interact

00:38:14.527 --> 00:38:18.847

with other stressors like fungus or insects,

00:38:18.847 --> 00:38:22.427

so I think that really our crystal ball

00:38:22.427 --> 00:38:25.497

isn't that great for what groves are

00:38:25.497 --> 00:38:30.077

likely to persist under future climate and which ones

00:38:30.077 --> 00:38:33.167

aren't, and human behavior hopefully

00:38:33.167 --> 00:38:34.677

will reduce emissions and the temperature and precip.

00:38:34.717 --> 00:38:37.777

increases will be on



00:38:37.777 --> 00:38:39.347

the smaller side rather than the bigger side.

00:38:43.467 --> 00:38:46.857

Thanks, Christy. I do have a few more questions. People have a lot of

00:38:46.857 --> 00:38:49.907

great questions today. Thank you everyone for joining and putting

00:38:49.907 --> 00:38:53.127

questions in the chat. It is great.

00:38:53.127 --> 00:38:56.307

Does wilderness designation restrict

00:38:56.307 --> 00:38:58.077

Activity? And you spoke to that a little bit, but maybe you can

00:38:58.897 --> 00:39:01.947

go into it a little bit more. Yeah, that's

00:39:01.947 --> 00:39:05.007

a great question and I'm not a Wilderness Act

00:39:05.007 --> 00:39:08.197

expert, so I will

00:39:08.197 --> 00:39:11.437

take a swing at it

00:39:11.437 --> 00:39:14.727

and Elly, please correct me. My

00:39:14.727 --> 00:39:17.467

understanding of the Wilderness Act is that it does

00:39:18.817 --> 00:39:21.987



specifically, outline some activities

00:39:21.987 --> 00:39:25.407

that we really don't like to have happen in

00:39:25.407 --> 00:39:28.497

wilderness. It doesn't mean that you cannot do them, but you

00:39:28.497 --> 00:39:31.787

wanna have a really strong

00:39:31.787 --> 00:39:35.107

justification for having an installation

00:39:35.107 --> 00:39:38.307

in wilderness or doing

00:39:38.307 --> 00:39:43.107

a trammel which is interfering with natural processes.

00:39:43.107 --> 00:39:46.127

So, it's not so

00:39:46.127 --> 00:39:47.927

much that I think there are.

00:39:48.527 --> 00:39:51.687

Well, I'm gonna stop there. Elly, are there

00:39:51.687 --> 00:39:54.727

Actually, there may be things that you absolutely cannot

00:39:54.727 --> 00:39:57.977

do. I'm not doing any of those things or proposing to do any

00:39:57.977 --> 00:40:01.247

of those things, but it definitely is a lot



00:40:01.247 --> 00:40:04.317

a strong lens to think carefully about

00:40:04.317 --> 00:40:07.807

what the minimum required activity is.

00:40:07.807 --> 00:40:10.307

But Elly, can you correct whatever I messed up?

00:40:11.327 --> 00:40:14.667

I can try, though, someone is gonna

00:40:14.667 --> 00:40:18.047

see this recording and mark me for not

00:40:18.047 --> 00:40:21.197

getting the Wilderness Act verbatim, but in

00:40:21.197 --> 00:40:24.447

areas that Congress has designated as

00:40:24.447 --> 00:40:27.457

Wilderness, there shall be no permanent road

00:40:27.457 --> 00:40:30.527

or commercial operations. Both of those things are

00:40:30.527 --> 00:40:34.677

restricted out right, and then there is and they act with it's called 4C

00:40:34.677 --> 00:40:38.027

restrictions or prohibited uses and that is often

00:40:38.027 --> 00:40:41.527

things like mechanized equipment or

00:40:41.527 --> 00:40:43.087



motorized equipment. Mechanized transportation.

00:40:43.457 --> 00:40:44.077

Um

00:40:44.637 --> 00:40:47.807

And things

00:40:47.807 --> 00:40:50.867

like helicopters, chainsaws, some of the

00:40:50.867 --> 00:40:54.667

tools that you might use in implementing an action, those

00:40:54.667 --> 00:40:58.357

are typically prohibited uses, except when determined

00:40:58.357 --> 00:41:01.467

to be necessary by the administering agency, and

00:41:01.467 --> 00:41:04.797

so, like Christy alluded to earlier, when we think

00:41:04.797 --> 00:41:08.247

about taking action in wilderness, there is a lot of

00:41:08.247 --> 00:41:11.697

Thought, and Christy has invested a lot of thought in this

00:41:11.697 --> 00:41:15.017

and even proposing this action as potentially

00:41:15.017 --> 00:41:16.487

being administratively necessary,

00:41:16.527 --> 00:41:19.697

given all of the factors that she's outlined



00:41:19.697 --> 00:41:22.777

here, and so that's really something that we're proposing to you as

00:41:22.777 --> 00:41:26.047

the public, that management of wilderness is

00:41:26.047 --> 00:41:29.377

never a black and white world. It's often we're taking

00:41:29.377 --> 00:41:32.907

critical. We're thinking critically about things like our enabling

00:41:32.907 --> 00:41:36.117

legislation, thinking about whether or not that this is

00:41:36.117 --> 00:41:40.487

a natural cause and event that would just happen without human

00:41:40.487 --> 00:41:43.857

intervention. Those are all considerations when we think of whether or not an action

00:41:43.857 --> 00:41:47.717

is necessary, and so that's kind of the first step of our analysis and

00:41:47.717 --> 00:41:47.717

then the second step is:

00:41:47.757 --> 00:41:51.427

if we do think it is necessary, what is the minimum

00:41:51.427 --> 00:41:54.437

Tool? And so, ensuring that we're not if we do

00:41:54.437 --> 00:41:57.887

not have to fly in things that we

00:41:57.887 --> 00:42:00.977



typically don't, and if we don't have to

00:42:00.977 --> 00:42:04.717

use mechanized

00:42:04.717 --> 00:42:08.097

tools, motorized tools, mechanized equipment that we

00:42:08.097 --> 00:42:11.297

don't, and we really weigh those things.

00:42:11.297 --> 00:42:14.367

There's an agreement of how we manage wilderness

00:42:14.367 --> 00:42:17.667

character, and it's looking at things like development: things like

00:42:17.767 --> 00:42:22.707

can natural proliferation of natural processes,

00:42:22.707 --> 00:42:25.807

things like trammeling, which is not

00:42:25.807 --> 00:42:28.907

trampling. It's really about our

00:42:28.907 --> 00:42:32.027

manipulation of the environment and the effect of our

00:42:32.027 --> 00:42:35.047

of our actions on the ecosystems within wilderness. And so those

00:42:35.047 --> 00:42:38.507

are all things that we consider when determining whether

00:42:38.507 --> 00:42:42.187

or not action is necessary and whether or not those prohibited typically



00:42:42.187 --> 00:42:42.277

prohibited tools are

00:42:43.897 --> 00:42:44.537

appropriate.

00:42:49.597 --> 00:42:50.567

Thanks, Elly, for

00:42:51.807 --> 00:42:56.237

going into more detail than I would have been able to

00:42:56.237 --> 00:42:59.807

verbally provide. I will add that we're finalizing

00:42:59.807 --> 00:43:02.997

the Minimum Requirements Analysis and

00:43:02.997 --> 00:43:07.397

once that is finalized, I will upload that to our

00:43:07.397 --> 00:43:09.977

public PEPC page and you can look at that.

00:43:11.057 --> 00:43:11.747

I believe,

00:43:13.327 --> 00:43:16.377

once that is up, as one of the materials you can

00:43:16.377 --> 00:43:19.537

look at. OK, I do have another question

00:43:19.537 --> 00:43:23.257

for Christy, which I actually already published: Will the

00:43:23.257 --> 00:43:26.997



soil composition be affected by erosion

00:43:26.997 --> 00:43:28.757

or excessive debris?

00:43:30.657 --> 00:43:34.617

That's a good

00:43:34.617 --> 00:43:39.247

question, and we don't know the answer to

00:43:39.247 --> 00:43:39.467

that.

00:43:40.367 --> 00:43:44.437

We had some

00:43:44.437 --> 00:43:47.727

USGS scientists run a soil erosion model

00:43:47.727 --> 00:43:50.907

for us to look at how

00:43:50.907 --> 00:43:53.977

much erosion might occur because of soil burn

00:43:53.977 --> 00:43:57.297

severity and the steepness of the slopes and

00:43:57.297 --> 00:44:00.707

there was high for Board Camp and Homers Nose, because

00:44:00.707 --> 00:44:03.817

they're very steep. It's been quite dry,

00:44:03.817 --> 00:44:07.107

so we haven't seen a lot



00:44:07.107 --> 00:44:10.257

of erosion on our visits out there, but

00:44:10.257 --> 00:44:10.377

we don't

00:44:10.457 --> 00:44:13.497

know, and we also don't know what

00:44:13.497 --> 00:44:16.727

the impact to bacterial and

00:44:16.727 --> 00:44:20.487

soil communities might have been from this large of an

00:44:20.487 --> 00:44:24.117

area of high severity fire. So, lots of unknowns with this

00:44:24.117 --> 00:44:24.367

new phenomenon.

00:44:27.887 --> 00:44:31.117

Thanks, Christy.

00:44:31.117 --> 00:44:35.017

I might be able to answer this one myself, but I'll just keep you

00:44:35.017 --> 00:44:38.257

on the hot seat here in relation to the drought question:

00:44:38.257 --> 00:44:41.337

Will the NPS irrigate sequoia groves in areas

00:44:41.337 --> 00:44:43.707

which that can be done in light of climate change?

00:44:44.277 --> 00:44:47.417



That's a great question.

00:44:47.417 --> 00:44:47.487

Thank you.

00:44:48.657 --> 00:44:52.447

The reality is, there's not enough

00:44:52.447 --> 00:44:55.547

Water. So, sequoias use the most water

00:44:55.547 --> 00:44:58.707

of any tree ever measured,

00:44:58.707 --> 00:45:01.807

and it's a lot in the summer.

00:45:01.807 --> 00:45:05.807

Thousands of liters of water,

00:45:05.807 --> 00:45:09.207

and so, they're already very effectively tapped

00:45:09.207 --> 00:45:12.587

into the existing water, and for us to

00:45:12.587 --> 00:45:15.667

get water to irrigate a whole grove, you

00:45:15.667 --> 00:45:19.267

would probably be taking away water that they were already using.

00:45:19.517 --> 00:45:23.157

Watering individual trees

00:45:23.157 --> 00:45:26.207

from target trees is certainly something



00:45:26.207 --> 00:45:29.357

that might be considered in

00:45:29.357 --> 00:45:32.487

the future, but how to provide enough water in

00:45:32.487 --> 00:45:34.407

an effective way would be a challenge.

00:45:37.297 --> 00:45:40.337

Thanks Christy. This is great.

00:45:40.337 --> 00:45:43.387

There are a lot of thinkers in this group. Here's one for you, we'll

00:45:43.387 --> 00:45:46.777

see if you can answer this one. What were

00:45:46.777 --> 00:45:49.727

the suspected climate conditions in 1297?

00:45:50.697 --> 00:45:53.827

It was a drought. It was a dry

00:45:53.827 --> 00:45:57.247

period and if you look at the tree ring

00:45:57.247 --> 00:46:00.547

records there is a signature in there that it was a

00:46:00.547 --> 00:46:01.067

very dry period.

00:46:03.727 --> 00:46:07.057

And I have another one: Do

00:46:07.057 --> 00:46:10.377



you document the specific source of seedling and record

00:46:10.377 --> 00:46:11.077

where you just planted?

00:46:12.557 --> 00:46:16.017

So yes and no. For all

00:46:16.017 --> 00:46:19.787

the seedlings that are not from Board

00:46:19.787 --> 00:46:23.197

Camp that we will keep very careful track

00:46:23.197 --> 00:46:26.547

of where they came from and which seedlings they are.

00:46:26.547 --> 00:46:30.927

For the rest of the seedlings, 12,000 is a lot to keep track

00:46:30.927 --> 00:46:34.507

of, and we will have a stratified

00:46:34.507 --> 00:46:37.657

monitoring to track survivorship for those, so

00:46:37.657 --> 00:46:41.327

for everybody else they will not be individually

00:46:41.327 --> 00:46:42.967

tracked, but there will be monitoring plots

00:46:43.027 --> 00:46:43.717

distributed.

00:46:46.587 --> 00:46:49.817

Great, thanks,



00:46:49.817 --> 00:46:53.367

Christy. That was our last

00:46:53.367 --> 00:46:53.447

question.

00:46:54.037 --> 00:46:57.197

We can wait if anyone

00:46:57.197 --> 00:47:00.637

has any last minute questions you haven't had a chance to type into the Q&A,

00:47:00.637 --> 00:47:03.167

we can give you another minute to do that.

00:47:04.497 --> 00:47:07.937

But I think that

00:47:07.937 --> 00:47:11.177

was a lot of questions. Thanks, everybody, for

00:47:11.177 --> 00:47:14.247

joining the call and listening. And thanks, Christy, for a

00:47:14.247 --> 00:47:18.227

great informative presentation. And thank

00:47:18.227 --> 00:47:21.167

You, Elly, for your information, and also Clay.

00:47:25.757 --> 00:47:28.787

OK, there's a new one.

00:47:28.787 --> 00:47:32.307

It says: I sincerely appreciate this thoughtful and educational

00:47:32.307 --> 00:47:35.647



presentation and just want to say thank you to the entire team for the work you're doing.

00:47:35.647 --> 00:47:38.887

I love these big trees and support your stewardship efforts.

00:47:38.887 --> 00:47:41.937

Thank you. That's a nice way to...

00:47:43.617 --> 00:47:46.927

And there's some more. Thank you. OK, wait there

00:47:46.927 --> 00:47:49.997

is another question. There's another comment: Thank you, NPS,

00:47:49.997 --> 00:47:53.647

for stewarding our lands. And then there's another

00:47:53.647 --> 00:47:56.747

Question: Will you be replanting trees other than giant sequoia trees?

00:47:58.387 --> 00:48:01.707

Great question, and the

00:48:01.707 --> 00:48:05.797

answer is yes. So, this year, we're only growing

00:48:05.797 --> 00:48:08.967

sequoia. Next year, we will also be growing

00:48:08.967 --> 00:48:12.087

CA black oaks and sugar pines, because

00:48:12.087 --> 00:48:15.117

we anticipate that those are the other

00:48:15.117 --> 00:48:18.377

most limited species that incense cedar, and



00:48:18.377 --> 00:48:21.797

fir will be able to get back on their

00:48:21.797 --> 00:48:24.867

own. So yes, the plan for next year's planting palette

00:48:24.867 --> 00:48:27.377

is to include sugar pine and CA black oak as well.

00:48:28.797 --> 00:48:33.687

Great.

00:48:33.687 --> 00:48:36.807

OK, thanks, Christy. OK, I don't see

00:48:36.807 --> 00:48:39.917

any other questions coming in. I did

00:48:39.917 --> 00:48:43.427

want to just remind everyone that this

00:48:43.427 --> 00:48:46.627

is the public comment period, which goes for 30

00:48:46.627 --> 00:48:50.197

days. So, if you think of things after this call that you want to

00:48:50.197 --> 00:48:54.067

ask us, you can provide written comments to that

00:48:54.067 --> 00:48:57.647

Public PEPC page where you found this link to

00:48:57.647 --> 00:48:59.987

the meeting. We will be accepting comments until midnight

00:49:00.067 --> 00:49:03.347



of March 25th, so

00:49:03.347 --> 00:49:06.477

please submit any questions or comments that you would

00:49:06.477 --> 00:49:09.247

like to provide to us while we're reviewing this project.

00:49:09.837 --> 00:49:13.957

I do have one more question that

00:49:13.957 --> 00:49:13.987

just came in.

00:49:15.707 --> 00:49:19.067

OK, I think you just

00:49:19.067 --> 00:49:22.417

answered it in the chat, but, did the 1297

00:49:22.417 --> 00:49:25.557

drought extend beyond the immediate region?

00:49:25.557 --> 00:49:28.747

And Christy responded: I don't know that

00:49:28.747 --> 00:49:29.457

level of detail, but I think so.

00:49:30.257 --> 00:49:33.357

So, if anyone

00:49:33.357 --> 00:49:36.487

else has a question, I think we might

00:49:36.487 --> 00:49:39.767

pass it back to clay here to wrap up



00:49:39.767 --> 00:49:42.867

the meeting, but please again feel free to type it in and if we

00:49:42.867 --> 00:49:45.897

see it we will answer it and if not

00:49:45.897 --> 00:49:49.067

we will publish it again to the PEPC website

00:49:49.067 --> 00:49:52.247

and we will respond to you. OK, and thanks

00:49:52.247 --> 00:49:54.247

everyone again for joining, and with that, I will

00:49:54.847 --> 00:49:57.887

pass it back to our fearless leader, Clay.

00:49:57.887 --> 00:49:59.677

And thanks again. Christy, much appreciated.

00:50:00.587 --> 00:50:03.917

Yeah, I really want to thank everybody for

00:50:03.917 --> 00:50:07.457

joining us today, and for some really thoughtful questions.

00:50:07.457 --> 00:50:11.227

I have just been Superintendent here about a year

00:50:11.227 --> 00:50:14.497

and a half, but I started visiting

00:50:14.497 --> 00:50:17.927

the Sierra Nevada in the early 1990's

00:50:17.927 --> 00:50:22.077



with my first visit, and I have been back here many times

00:50:22.077 --> 00:50:25.477

as a visitor, and have walked

00:50:25.477 --> 00:50:29.287

among the giant sequoias on

00:50:29.287 --> 00:50:30.757

all those visits. I never,

00:50:30.797 --> 00:50:33.967

the thought never entered my

00:50:33.967 --> 00:50:37.167

mind that those

00:50:37.167 --> 00:50:40.717

trees wouldn't be here forever and

00:50:40.717 --> 00:50:43.937

why would you think otherwise, right? They've stood

00:50:43.937 --> 00:50:48.127

For, these specific trees, 1000 to 2000

00:50:48.127 --> 00:50:51.187

years or more. The actual trees that we're now replacing

00:50:51.187 --> 00:50:54.367

in Board Camp stood,

00:50:54.367 --> 00:50:57.527

you know, hundreds of them, for literally

00:50:57.527 --> 00:51:00.927

thousands of years. And so, I think that the



00:51:00.957 --> 00:51:04.177

past two seasons

00:51:04.177 --> 00:51:08.047

have served as a wake up call that

00:51:08.047 --> 00:51:11.507

we cannot take for granted that giant sequoias

00:51:11.507 --> 00:51:14.567

will continue to thrive for the next 1000

00:51:14.567 --> 00:51:17.667

years as they have over the past few

00:51:17.667 --> 00:51:20.687

thousand years, at least without some

00:51:20.687 --> 00:51:24.077

intervention on our part to try to reverse some of these

00:51:24.077 --> 00:51:27.967

human influences that have been detrimental to the

00:51:27.967 --> 00:51:30.667

giant sequoia population. And so, while we work

00:51:30.967 --> 00:51:34.257

to reduce future losses of

00:51:34.257 --> 00:51:37.607

these monarch trees, because I don't think any of us want to

00:51:37.607 --> 00:51:40.777

be thinking about, it'll be another 500 years

00:51:40.777 --> 00:51:44.187



before we can appreciate them. So, we are

00:51:44.187 --> 00:51:47.217

working actively to try to

00:51:47.217 --> 00:51:50.897

reduce any future losses of these monarch trees,

00:51:50.897 --> 00:51:53.997

but at the same time, we have got to take action

00:51:53.997 --> 00:51:57.837

to ensure that there will be a next generation of

00:51:57.837 --> 00:52:01.187

giant sequoia trees to replace the ones that

00:52:01.187 --> 00:52:01.717

have been lost.

00:52:01.757 --> 00:52:04.777

In recent

00:52:04.777 --> 00:52:08.597

years, so stewardship takes a village.

00:52:08.597 --> 00:52:11.647

Stewardship requires a lot of public engagement. I think

00:52:11.647 --> 00:52:15.717

in order to try to address these issues

00:52:15.717 --> 00:52:19.057

Together, and with that in mind, I really want to

00:52:19.057 --> 00:52:23.787

again, thank you for your interest in this critical



00:52:23.787 --> 00:52:26.937

stewardship issue and really look forward to

00:52:26.937 --> 00:52:30.307

receiving your comments. Again,

00:52:30.307 --> 00:52:32.007

thank you and I hope you all have a

00:52:32.367 --> 00:52:33.217

good evening.