

Meeting Summary

Project:	Upper Platte River Drought Contingency Plan	
Subject:	Drought Task Force Meeting #3 and Drought Tabletop Exercise	
Date:	Tuesday, May 23, 2023	
Location:	Keith County Fairgrounds Exhibit Hall, Ogallala, NE	
Attendees:	Scott Dicke, CNPPID	Melissa Mosier, Audubon Great Plains
	Tyrell Anderson, NPNRD	Chuck Henkel, NPNRD Board
	Mike Archer, NGPC	Keith Koupal, NGPC
	Larry Reynolds, Ag Producer	Jeff Shafer, NPPD
	Dennis Schilz, Western Irrigation District	Joe Wahlgren, TPNRD Board
	Mike Drain, CNPPID	Joe Larson, TBNRD
	Michael Ann Relka, Western Sugar Co-op	Jim Ostdiek, NeDNR
	Jeremy Gehle, NeDNR	Scott Schaneman, NPNRD
	Travis Preston, NPNRD	Ryan Reisdorff, SPNRD
	Galen Wittrock, SPNRD	Kent O. Miller, TPNRD
	Lyndon Vogt, CPNRD	Jesse Mintken, CPNRD
	Phil Luebbert, JEO	Jacob Fritton, The Nature Conservancy
	Ryan Kelly, NeDNR	Caitlin Kingsley, NeDNR
	Stefan Remund, NeDNR	Elizabeth Esseks, NeDNR
	Avery Dresser, NeDNR	John Engel, HDR
	Paul Woodward, HDR	Julie Molacek, HDR

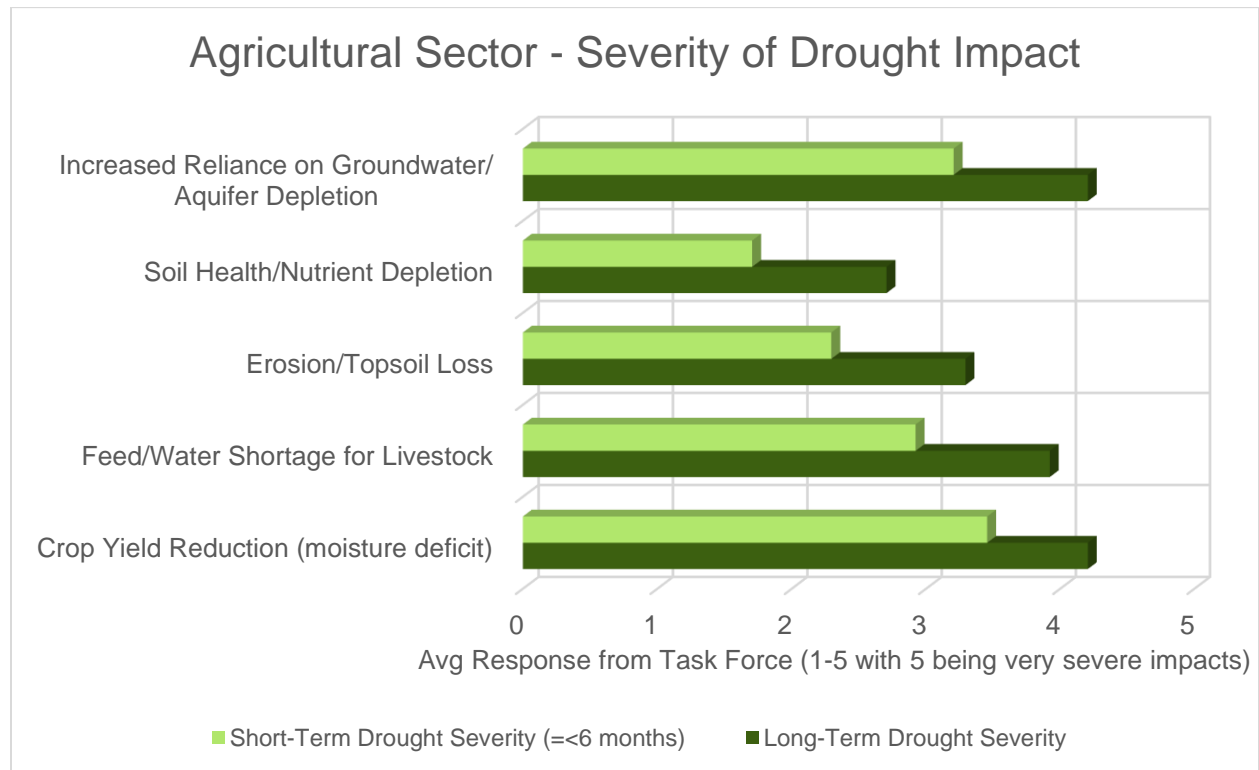
The Central Platte Natural Resources District (CPNRD), North Platte Natural Resources District (NPNRD), South Platte Natural Resources District (SPNRD), Tri-Basin Natural Resources District (TBNRD), Twin Platte Natural Resources District (TPNRD) (collectively, the Upper Platte Basin NRDs), and the Nebraska Department of Natural Resources (Department or NeDNR) gathered on May 23, 2023, for the third meeting of the Drought Task Force as part of the development of a Drought Contingency Plan for the Upper Platte River Basin in Nebraska.

After a review of the identified vulnerabilities, priorities, and monitoring data discussed at the last Drought Task Force meeting (March 29, 2023), attendees discussed possible mitigation and response actions by sector. Attendees then broke into small groups for a tabletop exercise where they talked through single and multi-year drought scenarios.

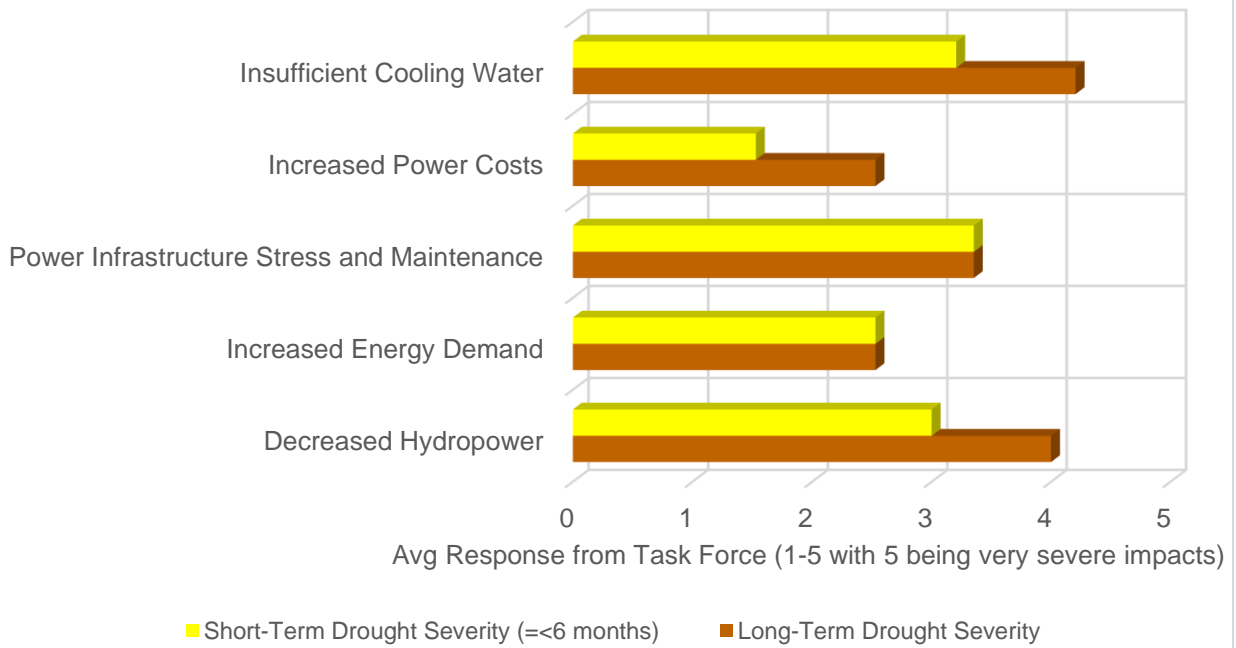
Review of Vulnerabilities, Priorities, and Monitoring Data

Vulnerabilities and Priorities

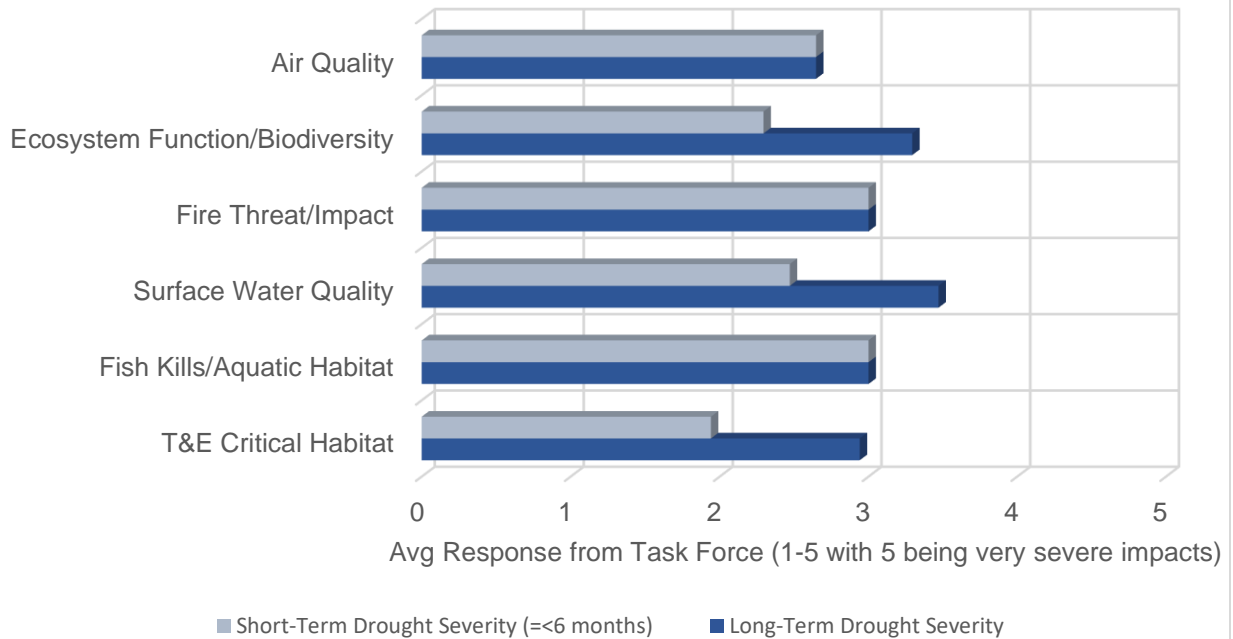
- Previously, Drought Task Force members helped identify different drought vulnerabilities by sector.
- Members also helped identify high-priority sector vulnerabilities. Those vulnerabilities and priorities are summarized in the figures below.



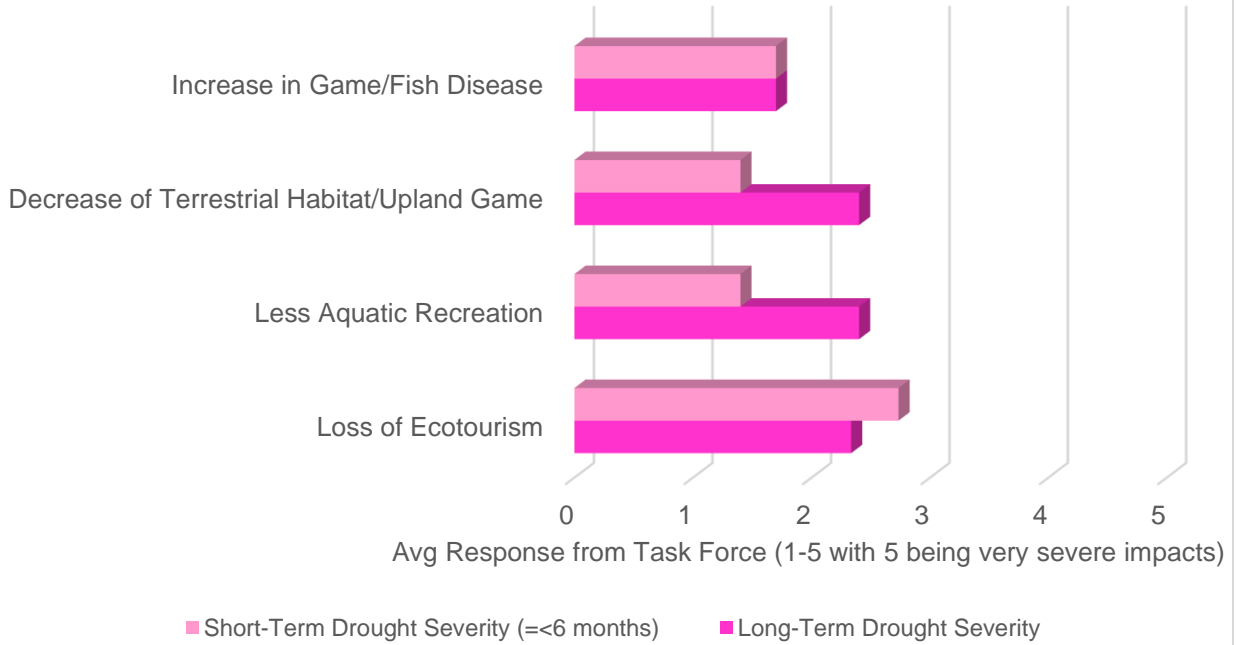
Energy Sector - Severity of Drought Impact



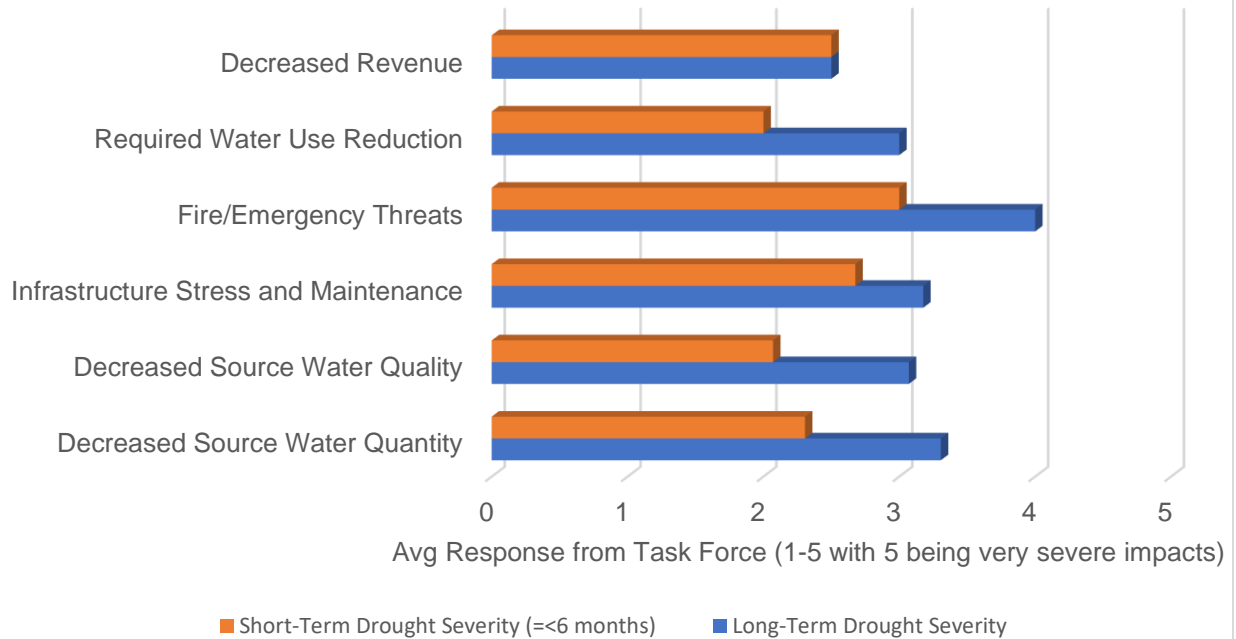
Environmental Sector - Severity of Drought Impact



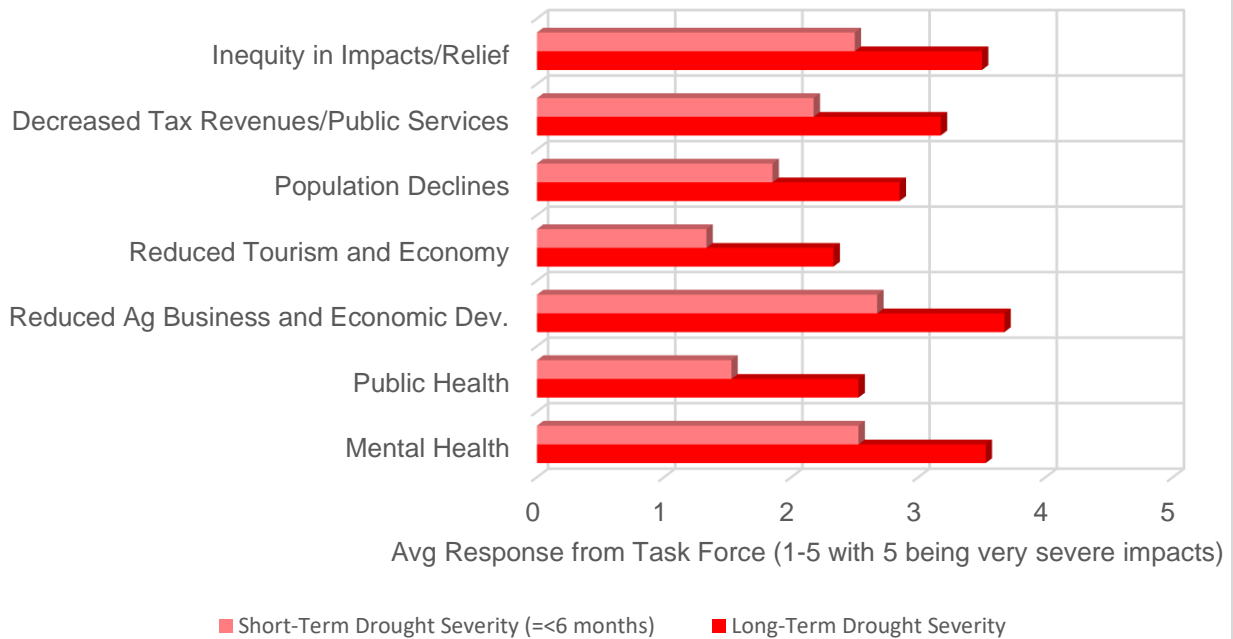
Recreation Sector - Severity of Drought Impact



Municipal/Industrial Sector - Severity of Drought Impact



Socio-Economic Sector - Severity of Drought Impact



Monitoring Data

- Based on feedback received at previous meetings, the following indicators and indices are determined to be the most beneficial:
 - Crop Yields / Net Irrigation Requirements: EDDI or SPEI (1 to 6 months)
 - Energy Demands / Cooling Degree Days: EDDI or SPEI (1 to 4 months)
 - Filling of Reservoir Storage: PDSI, SPEI, North Platte Snowpack
 - Summer River Flows: PDSI, Snowpack
 - A preferred method for is linking Missouri Basin River Forecast Center stream flow ensembles with reservoir / water supply modeling, such as USBR's North Platte River Basin Annual Operating Plans
- The following table presents a simplified list of the drought monitoring elements and availability of useful data that may be carried forward in a drought monitoring dashboard or considered for drought triggers:

Monitoring Element	Timing
System Reservoir Water Storage	Year-round
Drought Indices (PDSI, EDDI, SPI)	Year-round
River Flows	Year-round
Snowpack	February – May
Water Delivery/Runoff Forecasts (BOR, etc.)	February-April
Aquifer Levels	Spring and Fall
Allocation Status (Where Applicable)	Spring/Summer

- Participants had interest if data from 2012, 2002, early 90s was looked at to see how the droughts formed – did they come out of Kansas, Colorado?
 - Have we looked at 2012 to see if anything outside of our normal might help predict when a drought may be coming (e.g., if Oklahoma is dry)
 - Questions from the group asked if trends existed between weather patterns and water availability from snowpack and/or precipitation. This is tough from a predictive standpoint because there is inconsistent rainfall
- First year of drought has potential to hurt Lake McConaughy the most, if too much water is released – it may cause problems if / when droughts go into multiple years
- Looking at the curve of drought regionally (e.g., temperature increases, then soil moisture decreases, etc.) – is it possible to expand looking at indices 2010-2014 in surrounding area?
 - Will eventually look to make a story map about various historic droughts to accompany the monitoring dashboard
- General question: How often is the snowpack being short an indication of the precipitation in Nebraska being short?
- Farmers / operators already know what to look at, and what’s currently available – is there something else DNR or a consultant can look at to create another line of data? Maybe looking at El Niño / La Niña
 - That information can be provided on the dashboard
- Are insurance and banks proactive or reactive?
 - There are some projections out there – often more short-term
- Would looking at a timeline be beneficial for identifying drought planning tools we didn’t already have?
- A lot of the identified indicators and indices are on the supply side, not much monitoring and indicators on the demand side (e.g., irrigation)
- When looking at long-term, may want to look at 10-year interval vs history of database – more broad-scale resolution rather than finer scale of looking at reservoir levels for short-term drought.

- Would like to look at creating tools that can be used to predictively identify drought risk by correlating with various indicators.
- Allocations in some NRDs are used as both mitigation and response actions – allocations are adjusted, as needed, after each period (add this as a considered action in the plan)
- PDSI and other indices will start to come back before a drought ends, but it takes a long time for the system storage to catch back up after it's gotten behind.

Discussion of Mitigation and Response Actions by Sector

Mitigation & Response Actions

- A **Mitigation Action** is an action taken prior to the start of the drought to potentially help lessen the impacts once a drought begins.
- A **Response Action** is an action taken once the drought has started to handle the impacts in the moment
- Using feedback from the previous Drought Task Force meeting, the recommended mitigation and response actions have been proposed for each sector.
 - Participants noted that some of the actions may be both mitigation AND response actions
 - SPNRD uses allocations as both a mitigation and a response

Agriculture

Action Type	Action	Vulnerability Addressed
Mitigation	Crop Variety and Seed Spacing	Crop Yield Reduction
Mitigation	Groundwater Recharge Projects	Groundwater/Aquifer Depletion
Mitigation	Irrigation Efficiency	Groundwater/Aquifer Depletion
Mitigation	Rangeland Health (rotational grazing, etc.)	Livestock Feed Shortage, Soil Health
Mitigation	Soil Health (conservation tillage, cover crops, etc.)	Crop Yield Reduction, Soil Health, Erosion
Mitigation	Erosion Conservation Measures	Erosion, Soil Health
Mitigation	Commingled Irrigation	Crop Yield Reduction

Action Type	Action	Vulnerability Addressed
Response	Livestock Protection, Shade, and Water	Livestock Water Shortage/Health
Response	Irrigation Scheduling	Groundwater/Aquifer Depletion
Response	Emergency Hay/Forage (FSA programs, etc.)	Livestock Feed Shortage

Energy

Action Type	Action	Vulnerability Addressed
Mitigation	Increase Groundwater Available for Cooling Water	Insufficient Cooling Water
Mitigation	Protect Power Infrastructure from Fire Threats (like wildfires, etc.)	Power Infrastructure Stress and Maintenance
Mitigation	Improvements to Power Infrastructure to Reduce Potential Fire Cause	Power Infrastructure Stress and Maintenance, Fire Threat
Mitigation	Improve efficiency of Water Delivery	Decreased Hydropower, Insufficient Cooling Water

Action Type	Action	Vulnerability Addressed
Response	Load and Peak Demand Management	Increased Energy Demand and Power Costs

Municipal/Industrial/Domestic

Action Type	Action	Vulnerability Addressed
Mitigation	Develop Emergency Action Plans for Water Shortage	Decreased Source Water Quantity, Fire/Emergency Threats
Mitigation/ Response	Drill Deeper Production Wells/Replace Older Infrastructure	Decreased Source Water Quantity, Infrastructure Stress and Maintenance, Decreased Revenue
Mitigation/ Response	Increase Groundwater Quantity Monitoring	Decreased Source Water Quantity
Mitigation (# of monitoring wells)/ Response (increased frequency)	Increase Groundwater Quality Monitoring	Decreased Source Water Quality

Action Type	Action	Vulnerability Addressed
Response	Water Use Restrictions - Voluntary and Mandatory (Lawn Irrigation)	Decreased Source Water Quantity
Response	Emergency/ Fire Water Storage and/or Access	Fire/Emergency Threats
Response	Emergency Potable Water	Fire/Emergency Threats

Environmental

Action Type	Action	Vulnerability Addressed
Mitigation	Increased habitat/biodiversity (“Corners for Wildlife” for example)	Ecosystem Function/ Biodiversity, T&E Critical Habitat
Mitigation	Increase Riparian Buffer Zones	Terrestrial and Aquatic Habitat, Surface Water Quality
Mitigation	Improve Drought Resilient Habitats (existing and new)	Ecosystem Function/ Biodiversity, T&E Critical Habitat
Mitigation	Controlled Burns	Fire Threat
Mitigation	Improve Wildlife Protection	Biodiversity, Aquatic Habitat, T&E Critical Habitat
Mitigation	Control Invasive and Monoculture Vegetation (Phragmites, Cedars, Russian Olive)	Fire Threat/Impact, Ecosystem Function, T&E Critical Habitat

Action Type	Action	Vulnerability Addressed
Response	Coordinate Wildfire Suppression	Fire Threat/Impact
Response	Habitat Recovery	Biodiversity, Aquatic Habitat, T&E Critical Habitat

Recreation

Action Type	Action	Vulnerability Addressed
Mitigation	Lake Dredging	Aquatic Recreation, Ecotourism
Mitigation	Watershed WQ Management	Aquatic Recreation, Game/Fish Disease, Ecotourism
Mitigation	Drought Resilient Water-Based Recreational Facilities	Aquatic Recreation, Ecotourism
Mitigation	Improve diversity of recreational activities	Ecotourism

Action Type	Action	Vulnerability Addressed
Response	Fish and Game Regulations During Drought	Game/Fish Disease, Aquatic Recreation, Upland Game

Socio-Economic

Action Type	Action	Vulnerability Addressed
Mitigation	Access to Different Mental Health Resources	Mental and Public Health
Mitigation	Public Outreach and Drought Education	Decreased Public Services, Economic Development
Mitigation	Prepare and Train for Disease Outbreaks	Public Health
Mitigation	Improve Communication About Available Financial Assistance	Inequity in Relief, Mental Health, Population Decline
Mitigation	Improve Drought Resilience of Public Services	Decreased Tax Revenue, Reduced Economy, Economic Development

Action Type	Action	Vulnerability Addressed
Response	Increase Drinking WQ Monitoring	Public Health
Response	Increase Air Quality Monitoring	Public Health
Response	Coordinate Disaster Relief	Inequity in Relief, Mental Health, Reduced Economy
Response	Emergency Response (Red Cross, National Guard, coordinate volunteer fire districts, etc.)	Public and Mental Health

Drought Tabletop Exercise – Small Group Discussions

- Using the 2012 drought (single-year) and the 2003-2006 drought (multi-year), as historical reference, participants broke into 4 groups to talk through Single and Multi-year drought scenarios.
- Participants were asked to think about different time periods during drought and think about:
 - What data they are paying close attention to?
 - What coordination activities may need to take place?
 - What mitigation actions should be considered – what ripple effects might there be from these actions, what policies/project/coordination activities are needed, do they support or conflict existing plans?
 - What are some specific triggers for each action?

Group 1

Participants: Scott Dicke (CNPPID), Jim Ostdiek (NeDNR), Keith Koupal (NGPC), Jesse Mintken (CPNRD), Joe Larson (TBNRD Board),

Single-Year Drought – When April / May forecasts come out (Spring):

- In the agriculture sector: crop variety & seed decisions have already been made.
 - Can't predict ag conditions – have to react. It's tough to out-irrigate a drought.
- Watch the supply (CNPPID); commingled supply.
- Looking at water supply - carryover, snowpack, Bureau forecasts, allocations above state line.
 - In the Panhandle, the canals will be deciding whether to do a hay run (will they put water in canals).
 - They have to decide if there is going to be enough water for the year.
 -
- Areas above McConaughy have become losing reaches
- Irrigating corn in western NE is about supplementing deficits in precipitation (April-September). In eastern NE, corn irrigation is about retiming rather than supplementing precipitation. Corn takes 24" of water to grow.
- Need to discuss water management. At the end of the irrigation season, they are considering utilizing Johnson Reservoir.
 - Customers like recreation, but the system was built for irrigation ("lifestyle change versus crash diet")
 - CNPPID has a scheduling system for their irrigation deliveries.
- Lake McConaughy storage contracts – deciding how soon to pull flow.
- Producers decide when they want to use it - Decision to call natural storage or not?
 - Other sectors make educated guesses
 - NeDNR and CNPPID are looking at Bureau reports.
 - North Platte Decree - allocations at 1.1 MAF

Single-Year Drought – When drought is starting (Summer):

- Lots of communication is needed
- CNPPID deliveries are already decided upon.
 - Potential restrictions on recreation (if people can't get their boats in the water)
- Below Lake McConaughy: accounting natural flow or storage
 - Order water
- Above Lake McConaughy: storage contracts with the Bureau.
 - Have to plan irrigation releases 4 days in advance.
- E65 canal: plan 3 days in advance.
- EA releases: FWS protected flows. It's their water to use how they want
- CNPPID: much of the system is metered.
 - CNPPID has a 5-day delivery time; customers can reject irrigation water if they don't end up needing it.

- Rejected irrigation flows can be returned to the river. Management includes automatic gates, schedules, planning ahead a day.
- Environmental: reactive management. CRP/CREP allows producers to enroll marginal land
- Frustration with discharges from Lake McConaughy (decisions by USFWS); led to discussion of federal triggers; the water is theirs (USFWS) to use.
- Allocations are effective mitigation, but also a decision to sacrifice.
 - Everyone needs to be willing to sacrifice for it to be fair
- Money is a big motivator
- Elwood Reservoir – TBNRD mound, PRRIP, state credits
- Perkins County Canal construction – guarantees flow outside irrigation season
- Can we build more reservoirs out west?
- In the eastern areas of the Basin, producers use irrigation to re-time, not supplement, rainfall. Crop variety, seed spacing could help with IMP implementation. It's all about education (e.g., if you're looking to do something different, here are options). Subsidies may help with implementation.
- Agricultural education – BMPs
- Education - who are we targeting? Producers? Municipalities?
- Groundwater recharge projects – benefits and consequences
 - During wetter conditions, recharge projects can help provide baseflow returns when needed.
 - Recharge contracts between NRDs, State
 - Repercussions to natural peak flows. Long-term environmental impacts?
- Irrigation efficiency repercussions
 - Lining canals should be done on a case-by-case basis. Necessary in some areas, but not others. Canal seepage can be beneficial
 - Irrigation water is reused multiple times in the Platte valley – efficiency affects returns/ reuse
 - If they're recharging during a wet time, there's no effect to the east; if they're recharging when it's dry, there will be an effect to the east.
 - TBNRD has lower pumping costs because of canal recharge.
- Look at the spatial scale.
- There are natural repercussions to reducing peak flows.
- Fish and game regulations during drought – salvage permits or conservation? Could go either way depending on how dry it is.

Multi-Year Drought – Early in drought, following the summer of year 1 (Fall):

- Monitoring wetland inflows, reservoir levels, storage, carryover, supplies
 - Look at inflows from Llewellyn, estimate the water supply (look at historic water supply records).
- CNPPID: determining allocations on deliveries.
 - Dredging diversions 24/7, 365
- Producers: looking at potential SW allocations, switching to groundwater

- Consider drought hybrids, no-till corners, dryland corn, milo.
- Establish allocations/caps + metering – potential mitigation action
- CPNRD: has groundwater management zones. Waits to trigger groundwater allocations until spring. Once triggered, levels in the zone need to be above the trigger for 3 years to remove allocations.
- Reservoir management – easier to do habitat repairs when reservoirs are lower.
 - When reservoir storage is low, they can go in to add riprap, etc. to improve habitat, reduce sedimentation, improve stabilization.

Multi-Year Drought – When drought moves into multiple years:

- Producers looking at dryland yields.
- Questions about crop insurance types and payouts
- Municipal restrictions
- Personal water conservation
- Public awareness & education regarding state water sources and management

Group 2

Participants: Tyrell Anderson (NPNRD), Chuck Henkel (NPNRD), Mike Archer (NE Game & Parks), Jeff Shafer (NPPD), Jeremy Gehle (NeDNR), Ryan Reisdorff (SPNRD), Kent O. Miller (TPNRD)

- When spring forecasts come out, irrigators are not paying much attention to drought indices, they are probably only looking at their remaining allocation.
- Reservoir managers are looking at SNOTEL, drought, and precipitation forecasts.
 - Managers at Lake McConaughy would benefit a lot from accurate drought forecasting for the region.
 - Often the main reason the reservoir gets into a bad position during a drought is not because of lack of inflows alone, but because too much water was released the previous year when there was no expectation of a drought.
- The Basin would benefit from more interstate communication with WY and CO, as well as giving NRDs a summary of NPDC meetings
- Rangeland and cattle ranchers are often overlooked by drought planners, despite rangeland making up more area than irrigated land in the upper part of the basin.
 - Ranchers would benefit from a tool that can indicate the status of grassland and/or predict the browning of grass.
 - Early predictions of drought can help ranchers decide when they need to destock (sell off cows) to avoid heavy financial losses.
 - Ranchers would benefit from being contacted by someone when their area becomes eligible for certain FSA programs based on time in drought.

- Because ranchers might only need to use these programs once every several years, they often struggle to navigate the system because it might have changed by then.
- Water quality testing should be increased during drought because nitrogen loading often increases during droughts and crop failures.
- There needs to be more emphasis on communicating with the public, and mass outreach could be drafted by the DNR but distributed through NRDs, so every NRD has a uniform message.
 - Communication with the public should reach them where they are, speak to them in ways that are easy to understand.
 - Most members of the public do not seek out government bulletins, go on NRD websites, etc.
 - Outreach messages need to be brought to them; in places they will see them.
- Twin Platte NRD wants to investigate coordinating N-CORPE augmentation pumping in the Platte with irrigation flows to supplement them as well.
- The drought dashboard should not create an information overload. It might be best to start visitors on a page that gives them good “at -a- glance” information and offer more information on other pages if they are interested.

Group 3

Participants: Larry Reynolds (TBNRD), Galen Wittrock (SPNRD), Lyndon Vogt (CPNRD), Scott Schaneman (NPNRD), Dennis Schilz (Western Irrigation District, TPNRD Board), Melissa Mosier (Audubon Great Plains), Phil Luebbert (JEO)

- There are a lot of airport weather stations
 - Seems like it wouldn't be much effort to add precipitation to those.
- People are still cautious, even following the increase in rain.
 - Had a workshop for Upper Niobrara White, climatologist went into detail for local area, talked about what would have to happen to turn the system around. Talked about needed rainfall/snowfall in CO/KS.
- Climatologists are good at telling you the next 3-4 months, but don't know about beyond that.
 - Mesonet is not being funded by the state, but by the University.
 - 5,000 to maintain one station.
 - Charge us 6,000 to maintain 6 of them we use for irrigation.
 - If state doesn't fund, won't get funded.
 - Were funded by state at one time.
 - Use for modeling as well.
 - SPNRD works with Co-op out of Cheyenne.
 - Is Legislature aware of issue?
 - They are, there will be a hearing this fall or next legislative session.
 - Don't know what needs to happen, if it needs to go to DNR, gets more expensive with University overhead. Governor is aware of it.
- Thinking about 2012, what mitigation actions could have been taken in advance?

- CPNRD didn't hurt much during the drought, but took a long time to recover from it.
- 2012 was a hard year for NPNRD.
 - Coming to end of allocation period
 - Board had to make some adjustments to allow producers to be viable - went to a 5-year allocation period.
 - There are about 10,000 acres that won't make it within allocation this period (43 producers) and incur a penalty.
 - Trying to promote crop moisture sensing, variable rate irrigation to help keep producers out of penalty. Likely won't be a lot of carry-forward (limited to 24 inches).
- Limited to 10 (inches of carryover). Wasn't as big an impact as extended drought (2012). Thinking about if they need to ratchet anything down – may be coming up on economic limit.
- In 2012, NPNRD could have an allocation sooner.
 - Many weren't accustomed to it.
 - 2009 was first year.
 - Some didn't fully understand/realize the consequences.
- Would producers grow a different crop if they knew?
 - I think they would have. They really pay attention to that.
 - Water department has been working with them, looking at different cropping.
 - Once you're in a penalty it's tough to get out.
- CPNRD saw people mix in a year of wheat or sunflowers to meet allocation.
- Timing is part of this discussion. Last year was a dry year. There were people really paying attention to amount pumped since they thought this would be a dry year as well.
 - They've said allocation helped, they've become better managers, and it's helped their bottom line.
- Surprised by the amount of producers that said we should've done an allocation a long time ago. Financially they all benefitted.
- In Pumpkin Creek they were already in allocation in 03. As drought proceeded, you saw way more management options, people were thinking outside of the box. In areas with new allocations, they didn't know what to do.
- Drought has been brought to the attention of a lot of people, if we get to another drought I think we'll be better off.
- There's a lot of discussion of storage, river flows. In SPNRD it's really just local rainfall. You look at basin-wide, and how do all entities come together?
- In TPNRD, we're looking at an education project, we monitor water pumped, and they watch it.
- Is telemetry worth the expense?
 - There are some great benefits to it, there's on the ground issues that make it difficult – wildlife/cattle damage, theft, farmer with a disc.
 - When it's damaged it's no use.
 - Have to deal with some pushback/negativity from constituency.
 - Offer to provide information to anyone who wants it.

- Farmers in CPNRD feel water is endless.
 - Think there's more awareness now due to what's going on in the southwest (Colorado River) and western Kansas.
- Sounds like what is being implemented now is education on management, crop diversity. Do you think it would be worthwhile to have lessons learned?
 - Absolutely.
 - There's discussion of adding telemetry meters.
- FSA uses rainfall data – ties into Mesonet. They provide funding/relief based on that.
- Issues with well interference?
 - See some interference east of Grand Island when you get out of Ogallala.
 - Shows up pretty quickly in a dry year.
 - In a normal year they pull that aquifer down pretty hard.
- John – Do you cost-share on well deepening?
- Don't cost-share on well deepening - most wells that get interference are shallow, e.g. house wells, installed in 50/60s.
- Going into a 5-year drought what could you do?
 - Educational is the main thing. People in the eastern section know, because they pump the aquifer down every year.
- When Platte dried up (2002-07) were there any issues with municipal water supply?
 - Some. As long as canals are running and there's supply usually we're ok. When canals shorten their season, water levels drop quickly.
- If we can improve forecasting and education with it that's the big key.
- If you look at climate projections, we may have drier summers. Same rainfall, more concentrated. Lower nighttime temperatures are an issue, ET continues.
- In a single-year drought, what data do you look at in the Spring?
 - Static water level - Pay very close attention to that.
 - Take fall water levels as well - fall levels show how hard aquifer was pumped.
 - For western part of state, snowpack is key.
 - For environmental groups, PRRIP designation of dry, average, wet.
 - Plans they have for releasing EA water, what purpose, times, amounts. That has been helpful for thinking about things like the river is dry, birds are nesting already, there's so much sand. What kind of impact will there be from releasing that EA water.
 - FWS watches North Platte gauge, accounts for lag time to make sure they don't go over flood stage at North Platte.
 - Last year had monthly meetings about what they expect for precipitation. Difficult to be sure about what to expect.
- One issue in CPNRD 4-5 years ago, nobody could take excess flows because there was EA water being released. NRDs have worked with program on that issue.
 - Right now taking for 8-9 days, if you can't take for 5 days you lost half of that. Have coordinated on that.
- Increase riparian buffer zones - Make those areas more resilient to drought and flooding.
 - There is a lot of push/funding to improve those areas.

- Would provide protection for communities / community water systems, also more resilient in drought times.
- In those flood zones, providing a connection for movement of wildlife. Acts as a habitat corridor.
- CPNRD sells about 14,000 AF a year to PRRIP.
 - SW rights that are no longer being used - SW exchange program.
 - Done on an annual basis right now, working on long term agreement.
 - Drought doesn't factor into it.
 - 28,000 AF no longer being taken out of river (switched to GW) half of the benefit to CNPPID, half to program.
 - Wouldn't make agreement for over 10 years, if need water for IMP would no longer sell to program.
 - Keeps 3 irrigation districts financially whole. They can sign up for program, if they do, can sell water.
- CPNRD looks at USDM first. If we see drought expanding on there, know it's on its way.
- Instead of 1-year, maybe look at 5-year water levels as you head into a multi-year drought.
- Hold educational meetings as you see drought coming on
- May be neglectful for dryland/range producers. Anything we could do more would be beneficial.
- University has put together drought on the range information.
 - Could help by sharing some of that information.
 - A little bit of management, financial management, just writing down ideas.
 - Producers have a lot of intuitional knowledge it helps to think through and write down.
- FSA does have a range program this year. There is some financial assistance to change how you've traditionally grazed.
- SPNRD looks at NRCS/FSA and think Feds will take care of range land.
- Cost-share for stock well.
 - Don't have anything for deferred grazing - talked about doing that for Cedar control.
- SPNRD can provide some cost-share for conservation practices, but they are of limited usefulness during drought.
- 15 - 20 years ago, seems like NRCS/FSA/NRD would have a workshop in the winter. We had great participation, but we've got away from that.
 - Now, we keep everything updated on website - Can link to NRCS/FSA. Don't know if we would get as good a response now.

Group 4

Participants: Travis Preston (NPNRD), Jacob Fritton (The Nature Conservancy), Michael Ann Relka (Western Sugar Co-op), Joe Wahlgren (TPNRD Board), Mike Drain (CNPPID)

Single-Year Drought – When April / May forecasts come out (Spring):

- If we put all of this monitoring data together in one spot, would that help? (10 years of data versus 20 year)
 - One page would get loud
 - Could simplify on that page – how do these items compare to the indicators
- Always looking at the demand side of things when looking at drought
 - Demand is caused by the 6-week weather trend
- Would like to look at a 2-part dashboard – supply and its effect on irrigation; and demand based on the timing of precipitation in the impacted area
- Is there a way to measure delivery?
 - Depends on a lot of things.
 - For many people – drought is just in a particular location.
 - For those delivering water, they have to look at is there a drought in the demand area
 - Then look at is there a drought in the supply
- Generally, growers in the upper basin know if there's a problem in January based on snowpack comparison
 - There was a drought in early 90's on the supply side (93-ish); CNPPID delivered almost no irrigation water all year
- We've broken this out single versus multi-year, but could also break out into precipitation drought versus supply drought (snow and groundwater), etc.
 - In some locations, snow drought is a bigger deal – could get 4 inches of rain, but still have issues if the snow isn't there
- There's almost nothing in April/May that can give you a local indication about a precipitation-based drought
 - Some things could show a trend/slightly leaning toward something
- The problem is you don't know this is a single-year drought or a multi-year drought
- Regional triggers are different across regions/sectors
- What are we triggering that we don't already have triggered?
 - The idea is that mitigation actions would be put in place ahead of time, response actions would be triggered as you need them
 - The producer will trigger what they need to, based on what's available
 - NCORPE – don't pump water to the river until you hit a certain condition; shouldn't pump all the time (i.e., don't pump in wet years – pump exact when/where it's needed)
- Perkins canal – how have we not talked about this as drought control; can it supplement a stressed system? Helps every district as it goes downstream and allows more water to be stored upstream
- Potential for triggers – regionalize by projects, opportunities for different projects (NCORPE, Perkins)
 - Perkins needs to not be another Lake Mac – used only for capacity storage, relief etc. – reservoirs need to be managed for irrigation (no cabins, minimum pools for fishing, etc.)
 - There's no way those reservoirs will have consistent levels
- In a high-use environment, is there a risk of shut down for cooling needs?

- Maybe cut back, but not necessarily looking at brown outs and black outs – would likely get more expensive because of power needed from the power pool
- Wondering how there will be enough power in the power pool in time of drought?
- If you get a 1-year drought, it's always 2, – there are scars left after the single-year; it takes 2 years to get the soil moisture back.
 - Allocations – you have people that will pump twice the water, and have to 'pay that back'
- How do we define drought regionally?
 - Drought to the North Platte is based on having water to stream
 - Drought to the Central Platte is based on Lake Mac
- Twin Platte NRD has been trying to promote no-till system in their area, have eliminated much of the return flow that was appropriated in the 70s –conservation efforts have a lagging effect
 - The more we go down the path of no-till, there's not as much runoff or return flow for those relying on surface water
- One idea was to flip triggers to wet years when storing water may not be necessary
 - Example: Lake Mac is 90% full, putting water in canals above Mac (upstream) for recharge might be better than having 100% full and no canals for recharge

Multi-Year Drought – Early in drought

- Have potentially exhausted some of our pre-planned mitigation actions (conjunctive management projects) and have to rely more on response actions
- Alternative crops are an option – but is there some mitigation planning we can do?
 - Out west – switch to wheat
- Reduced allocation of surface delivery (put on 2006 – 2009) – have made permanent adjustments following the 2000's drought
 - What was a response action is now mitigation – regularly using a lesser amount/allocation
 - Cover crops can help – starve one to feed the other
- Even if you can grow something, if the commodity price is low – it just gets worse and worse
- Last time there was a long drought, allocations weren't in place – what will it look like now?
 - Plant a cover crop – if conditions stay bad, leave the wheat; if they improve, terminate it and plant a cash crop
- Co-mingled irrigation is drought mitigation
 - This is the #1 tool – allow some sort of aquifer access during a drought, recover that aquifer during wet years
 - In areas you can't commingle yet – grant permission to use the aquifer if available
 - But aquifers in different areas are not going to be the same; some regions have better resources than out west

For Additional Consideration:

- Which of the mitigation and response actions from the scenario may need additional time, resources, and/or funding?
 - Might need to look at legal changes to help allow people commingle, amend IMP and NRD regulations
 - Change NCORPE usage to only meet compact and state protected flows
 - Conjunctive management would cause some additional work – takes a change in law/charter/regulation to allow a different type of management; need to look at what benefits the state versus what benefits an individual NRD/region

Next Steps

- Working to pull together a draft of the plan
 - Anticipated Summer 2023