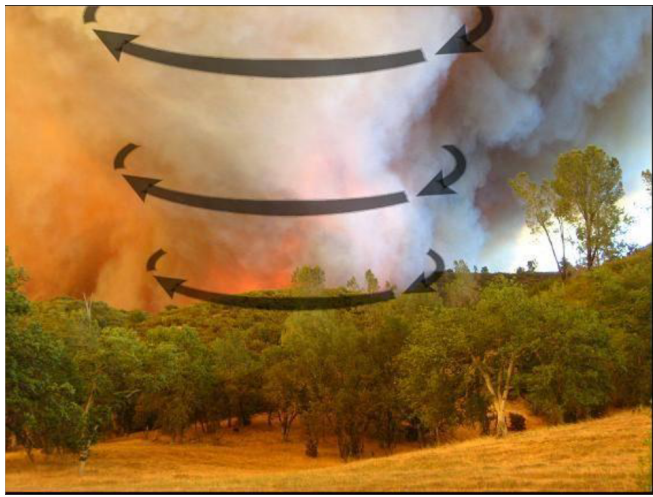


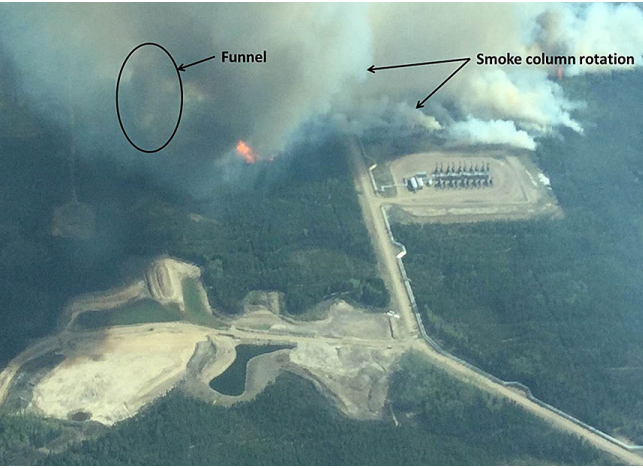
Green=Potential or Uncertain Status as a pyrotornado.
White=Likely or confirmed status as a pyrotornado.

EF/F-Scale Rating	Date	Fatalities /Injuries	Time (LST)	Coordinates	Location	Description	Photographs of the Tornado	Sources
F2	10/8/1871	?/?	10:00 pm CST	45.05,-87.74	Peshtigo, WI	Multiple eyewitnesses reported to have seen what was probably a significant fire tornado. Houses were lifted up hundreds of feet into the air, loaded rail-cars were tossed several hundred feet from the tracks and entire trees were uprooted. It was described as a large rotating black balloon. There are some sparse and unconfirmed reports of flying debris resulting in fatalities. Pieces of wood including a charred board were carried for 6-7 miles.		https://www.google.com/books/edition/Firestorm_at_Peshtigo/7ALzHG4sRmAC?hl=en&qbpv=0 https://minds.wisconsin.edu/bitstream/handle/1793/35448/Flesch.pdf?sequence=2&isAllowed=y
F?	10/8/1871	60/?	?	44.765,-87.541	Williamsonville, WI	A fire-induced tornadic vortex produced by the Door Peninsula fire passed over an open field where 77 people were sheltering. 60 of the 77 were killed.		1680-1991 Significant Tornadoes
F1	9/5/1881	?/>1	1:30 pm CST	44.02,-82.83	Huron City, MI	What might have been pyrotornado (described as an "black ugly-looking cloud with detached fragments whirling around the center") roared through the Huron Township and surrounding villages, uprooting and snapping numerous trees. The tornado also unroofed barns, threw down log houses and carried people through the air. Other possible pyrotornadoes occurred throughout the Thumb Fire that carried a 1000 pound wagon 82 yards and carried barn roofs 550 yards.		https://www.google.com/books/edition/Report_on_the_Michigan_Forest_Fires_of_1/RIUDAAAAYAAJ?hl=en&qbpv=1
F1	9/1/1894	0/0	2:00 pm CST	46.01,-92.93	Hinckley, MN	The Hinckley fire reportedly spawned a fire tornado that twisted off 8-inch poplar trees.		Minnesota Newspapers Archive
F1	9/11/1902	0/0	?	46.14,-122.45	Coweeman River, WA	What was likely a fire tornado uprooted trees near the Lewis River before ending at the headwaters of the Coweeman River. Several people witnessed whirling smoke and fire.		https://chroniclingamerica.loc.gov/lccn/sn84022770/1902-09-19/ed-1/seq-2/#date1=09%2F08%2F1902&index=0&date2=09%2F25%2F1902&searchType=advanced&language=&sequence=0&words=fire+Fires+fires+uprooted&proxdistance=5&state=Oregon&state=Washington&rows=20&ortext=&proxtext=&phrasetxt=&andtext=fire+uprooted&dateFilterType=range&page=1
F1	8/20/1910	0/0	?	?	Idaho	"The heat from these fires created tremendous drafts which swept whole mountain sides uprooting every tree. This draft in every instance became a sort of tornado which blew the timber in great whirls from one fourth to 1 mile in diameter. This wind in many instances was so strong that trees when uprooted were thrown several feet uphill from where they grew." - These tornado-like "drafts" might have been pyro-tornadoes but could have also been the result of fire-whirls or convective winds. There were eyewitness accounts of large whirling columns of smoke and fire. Places where potential fire tornadoes occurred include six miles north of Newport.		https://books.google.com/books?id=1b9GAQAAIAAJ&pg=PA116&pg=PA116&dq=1910+great+fires+whirlwind&source=bl&ots=JPFozndNM3&sig=ACfU3U1BiEFShB6W2gmVorRHus98e2nx9A&hl=en&sa=X&ved=2ahUKEwi_5YQv_KzrAhWRKs0KHa3cCL04ChDoATAHegQIBBAB#v=onepage&q=1910%20great%20fires%20whirlwind&f=false
F2	9/1/1923	~38000/?	3:30 pm JST	35.699,139.796	Tokyo, JP	An intense and deadly fire tornado tracked through Tokyo, snapping off 30 cm tree trunks and passing over a refugee-filled field resulting in the deaths of at least 38,000 people.		https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nbsspecialpublication470.pdf#page=48
F2	4/8/1926	2/3	10:30 am PST	35.248,-120.665	San Luis Obispo, CA	What was probably an intense fire tornado generated by a large oil fire swept away or demolished two cottages.		https://www.google.com/books/edition/Significant_Tornadoes_1880_1989_A_chrono/yW5NAQAAIAAJ?q=&qbpv=1&bsq=1926#f=false
F1	7/9/1945	?/?	?	34.230,135.170	Wakayama, JP	"Thirty to forty minutes after the outbreak of the great fire, violent fire tornadoes formed in several places in the city. The largest one among them originated in a street with a tramway 200m away to the south of the old city office ground and moved northward. The incandescent flame of the fire tornado streamed horizontally as if it were blown by bellows. Pine trees planted along the moat were torn away. An automobile flew over the bank and jumped into the moat; red hot zinc sheets and big logs were uplifted to a height of 20-30 meters."		https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nbsspecialpublication470.pdf#page=48
F1	8/6/1945	0/0	9:00 am JST	34.38,132.45	Hiroshima, JP	During the aftermath of the Hiroshima atomic bombing, a firestorm developed which generated a fire tornado. This fire tornado uprooted trees and threw debris around.		https://link.springer.com/article/10.1134/S0021894413050015
F0	8/8/1959	0/0	8:00 pm PDT	33.646,-117.369	Elsinore, CA	During the deadly Decker Fire, what might have been a strong fire tornado that was about 1000 ft in width tore through the fire area. Chamise stems 2 inches in diameter were twisted off 2 ft above the ground and sandblasted smooth. There were no rocks left smaller than a softball where the tornado traveled over rocky terrain.		https://www.wildfirelessons.net/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=f21ad827-798f-4d5a-a7ec-3a614c1b30fc&forceDialog=0

F1	9/1/1967	0/0	2:00 pm MDT	48.576,-116.622	Pack River, ID	The deadly Sundance Fire likely produced an intense pyrotornado that devastated the Pack River drainage area. Hundreds of trees were snapped or uprooted.		https://www.wildfirelessons.net/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=42e33dd7-e192-43f8-b6dc-cd4a8a97bd6c&forceDialog=0
F1	5/22/1968	0/0	5:00 pm MDT	54.91,-114.71	Lesser Slave Lake, CAN	Hundreds of trees were snapped or uprooted in circular patterns by what was likely one or more pyrotornadoes.		https://d1ied5g1xfqpx8.cloudfront.net/pdfs/23200.pdf
F?	10/7/1971	0/0	9:00 pm PDT	34.449,-119.552	Toro Canyon, CA	The Romero Fire generated what appeared to be a fire tornado that might have been responsible for the collapse of a steel tower.		https://www.wildfirelessons.net/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=453d25e7-a213-4908-82ab-510f8246e463&forceDialog=0 https://www.youtube.com/watch?v=mgzomkR-wWo
F1	11/27/1980	0/1	7:30 am PST	34.2413,-117.4256	Devore Heights, CA	What was possibly a fire tornado moved from a canyon into the neighborhood of Devore Heights. The tornado was reported to have been funnel-shaped and caused significant damage. Multiple homes lost windows with one losing a section of its roof, a refrigerator was thrown 200 ft, a pickup truck was moved sideways, the aluminum roof was ripped off of a workshop and trees were uprooted.		https://cdnc.ucr.edu/?a=d&d=SBS19801221.1.146&srpos=1&e=-----198-en--20--1--txt-txIN-fire+tornado-----1980---1
F1	2/16/1983	0/0	4:10 pm AWDT	-37.59,140.45	Mt Burr, AU	Large areas of trees were blown down or snapped off 13 ft above ground level as the fire passed through the area. "Tornadic effects" were observed within this blowdown.		Forest fires in South Australia on 16 February 1983 and consequent future forest management aims
F1	2/16/1983	0/0	7:30 pm AEDT	-38.44,144.05	Moggs Creek, AU	A fire tornado tore a 0.49-mile-long swath through forests near Moggs Creek. Mature ironbark trees up to 49 ft tall were uprooted or snapped.		Otways Fire - Aspects of Fire Behavior
F1	8/22/1986	0/0	1:41 pm EDT	47.27,-81.25	Garibaldi, CAN	Two large fire tornadoes up to 437 yards in width traveled 0.5-2.4 miles. Standing trees were ripped out of the ground, the ground was scoured and slash was driven into the ground. The associated pyrocumulonimbus produced rain intense enough to put out spot-fires.		https://www.researchgate.net/profile/Mike_Flannigan/publication/236272851_Development_of_large_vortices_on_prescribed_fires/links/00b49517833990e766000000/Development-of-large-vortices-on-prescribed-fires.pdf https://www.youtube.com/watch?v=rYmmqS8Oxag
F1	8/20/1992	0/0	?	40.908,-121.833	Burney, CA	The Fountain Fire generated what was likely a fire tornado on Hatchet Mountain near Burney. Mature ponderosa pine trees were snapped off 20 ft above the ground.		https://www.facebook.com/royal.burnett.5/posts/2199031256993116 http://archive.redding.com/news/embers-to-ashes-fountain-fires-15th-anniversary-recalls-destruction-ep-378423705-356527331.html
F1	8/25/1995	0/0	?	43.78,-121.99	Waldo Lake, OR	What was probably a large pyrotornado generated by the Carlton Fire uprooted dozens of trees.		https://www.wrh.noaa.gov/pqr/gallery8b.php
F1	6/11/1999	0/0	4:10 pm	63.84,-145.66	Donnelly Dome, AK	The Donnelly Flat fire likely generated at least one fire tornado that uprooted 20 ft tall		https://fire.ak.blm.gov/content/training/donnelly/b222%20team%20narrative.pdf

			AKDT			trees, sucked up a pump, and drew objects into it.		
F1	5/28/2001	0/0	8:00 pm MDT	54.959,-114.215	Chisholm, CAN	During an intense supercellular pyroCb event, the Chisholm fire likely spawned a tornado that uprooted and snapped numerous trees.		https://open.alberta.ca/dataset/3e8819b4-c259-4d29-9c0c-6a8f5af4c3df/resource/e1183159-a6ed-4e12-8571-e758b9adc5b4/download/2001-chisholmfire-finaldocumentationreport-section02.pdf https://firesearch.ca/sites/default/files/null/CDFR_2005_04_Prsnttn_FuelBehChar_ChisolmFire.pdf
F1	8/23/2001	0/0	~5:46 pm MDT	45.54,-110.77	Gallatin National Forest, MT	The Fridley Fire generated a strong fire tornado that snapped or uprooted hundreds of trees.		https://forestry.msuextension.org/publications/fact-sheets/FF_CaseStudyFridelyFire_PK.pdf
F2	6/17/2002	0/0	2:33 pm MDT	37.427,-107.554	Vallecito Reservoir, CO	On June 17, a strong fire tornado generated by the fire traveled through the northern periphery of Vallecito Reservoir, producing damage equivalent to an F2. Large spruce trees up to two feet in diameter were snapped off above the trunk, boats were picked up off the lake and hurled through the air to the other end of the lake, several vehicles were picked up and rolled, and a number of houses were damaged.		https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=5304208 http://rammb.cira.colostate.edu/training/visit/training_sessions/wildland_fire_detection_using_satellite_imagery/firesform_induced_tornado/
F2	1/18/2003	0/0	4:00 pm AEDT	-36.364,149.042	Canberra, AU	What was probably a family of 4 tornadoes moved from the Flea Creek area into the southwestern suburbs of Canberra. Trees were snapped or uprooted, cars lofted and homes unroofed.		http://www.highfirerisk.com.au/resdis/paper_0204.pdf
F?	10/25/2003	0/0	?	34.15,-117.54	Rancho Cucamonga, CA	Video footage taken of the Grand Prix Fire while it was producing a pyroCb showed what appears to be a large fire tornado.		https://vimeo.com/41411033
EF1	6/29/2007	3/0	7:30 pm MDT	40.54,-110.10	Neola, UT	What was described by witnesses as a "big tornado" unroofed a structure and uprooted trees. 3 people were killed when they were overrun by the fire tornado.		https://www.deseret.com/2007/7/3/20027858/rescuers-risked-their-lives-in-inferno https://bigsurkate.blog/2008/09/24/indians-fire-entrapment-61108/
EF1	7/16/2007	0/0	3:30 pm PDT	41.99,-120.53	Point Ranch, OR	What was likely a large fire tornado uprooted trees and caused tree tops to "explode."		https://calfire.blogspot.com/2007/07/inciweb-fletcher-wildland-fire-7600.html https://bigsurkate.blog/2008/09/24/indians-fire-entrapment-61108/ https://www.youtube.com/watch?v=PgxKKFXB5YQ&ab_channel=Collins

EF?	8/24/2007	0/0	2:55 pm EEST	37.51,21.69	Zacharo, GR	The killer Zacharo Fire spawned a large pyrotornado as it was rapidly spreading towards the town.		https://www.youtube.com/watch?v=xGcbkf5HxQ8&ab_channel=gregkoss https://www.youtube.com/watch?v=is7OVTOWgcQ&ab_channel=gregkoss https://www.youtube.com/watch?v=bivMMbTyMRk&ab_channel=gregkoss
EF0	6/11/2008	0/4	4:24 pm PDT	36.072000,-121.34000	Milpitas Road, CA	A 1000 ft wide fire tornado moved across Milpitas Rd, snapping off 18" oak tree limbs, scouring loose material and overtaking 4 firefighters. All firefighters were seriously burned.		https://bigsurkate.blog/2008/09/24/indians-fire-entrapment-61108/
EF1	2/7/2009	0/0	4:00 pm AEDT	-37.538,145.287	Strathewen, AU	A video taken during one of the Black Saturday bushfires shows what was likely a large fire tornado. There were also reports of localized wind damage in the area.		https://www.youtube.com/watch?v=XT0u7JrmlxQ https://www.youtube.com/watch?v=piKb0ob4bic https://www.youtube.com/watch?v=nXf-gBSAbXQ https://www.youtube.com/watch?v=piKb0ob4bic
EF?	9/4/2011	0/0	?	35.04,-118.44	Tehachapi, CA	Video footage shows a large fire tornado that was produced by the Canyon Fire.		https://www.youtube.com/watch?v=MWumoy7YWTg
EF1	8/16/2013	0/0	7:00 pm AKDT	63.246,-142.194	Tetlin Junction, AK	A video taken by a helicopter shows a massive quarter-mile wide fire tornado that tossed entire trees hundreds of feet into the air. The tornado lasted for about an hour.		https://www.youtube.com/watch?v=PumpZxMISWs https://fire.ak.blm.gov/content/news/flash/8-17-13_Moon_Complex_Update.pdf https://www.flickr.com/photos/31898755@N00/29813035858/

EF2	8/2/2014	0/0	5:00 pm PDT	40.848,-121.556	Hat Creek, CA	An intense and large fire tornado was spawned by the Eiler Fire. The tornado completely debarked numerous trees, scoured 2-4 inches of topsoil and destroyed a barn.	 Contributed video by Ray Parker	https://www.tandfonline.com/doi/abs/10.1080/00431672.2014.960326?journalCode=vwvs20 https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=541635 https://twitter.com/tony3483/status/1301751812920233984
EF?	5/22/2015	1/0	4:30 pm MDT	54.821,-110.354	Cold Lake, CAN	What was likely a small fire tornado developed out of the convective column of a fire near Cold Lake. An air tanker was caught in the updraft of the fire tornado causing it to crash resulting in one fatality.		https://www.tsb.gc.ca/eng/rapports-reports/aviation/2015/a15w0069/a15w0069.html
EF?	7/9/2017	0/0	7:24 pm PDT	39.48,-121.42	Oroville, CA	A cone-shaped pyrotornado was spotted during the Wall Fire.		https://twitter.com/CBSSacramento/status/883928372090470401
EF0	7/14/2018	0/0	4:22 pm PDT	33.50,-114.589	Blythe, CA	A video captured by local residents shows what appears to be a small but intense pyrotornado that uproots trees, throws debris and sucks up water from a river.		https://www.youtube.com/watch?v=QoJZ3cieqK4&ab_channel=DailyMail
EF3	7/26/2018	4/6	7:30 pm PDT	40.611,-122.427	Redding, CA	A powerful pyro-tornado developed within the Carr Fire in western Redding, CA on July 26th, with winds estimated in excess of 143 mph. The fire tornado was estimated to be on the ground from 7:30-8:00 p.m. The fire tornado caused extensive wind damage while rapidly spreading the fire. The winds crumpled high tension electrical transmission towers, damaged homes, and debarked and uprooted trees. Wind damaged areas included locations untouched by fire, and included signs of ground scouring. The damage path was 0.5-1 miles long, with an estimated width of about half a mile. Three people were killed inside their Redding mobile home after the structure's walls were blown out and the roof collapsed on the occupants. A firefighter was killed while driving his vehicle near the fire whirl. Three bulldozers were impacted by flying debris, rocks, embers, smoke and intense heat, with the operators suffering injuries including burns and cuts from broken glass.	 Video courtesy, Cal Fire	https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=774718 https://projects.sfchronicle.com/2018/carr-fire-tornado/ https://www.spc.noaa.gov/publications/nauslar/Lareau_et_al-2018-Geophysical_Research_Letters.pdf https://www.flickr.com/photos/westernareapower/43293303085/in/photostream/

EF1	11/9/2018	0/0	11:26 am PST	34.032,-118.828	Malibu, CA	A fire tornado developed near Malibu during the Woolsey Fire. Trees were snapped, a truck was rolled and power-poles were snapped at the cross. A debris ball was visible on radar.		https://www.washingtonpost.com/weather/2018/11/13/that-flaming-whirl-woolsey-fire-was-it-actually-firenado/
F3?	12/30/2019	1/3	7:31 pm AEDT	-39.951,147.735	Jingellic, NSW	What was reportedly a fire tornado flipped over a fire-truck resulting in the one firefighter being killed. Trees were uprooted and thrown up to 100 meters, water tanks were thrown hundreds of yards and a roof was torn off of a home. The winds were estimated to reach 198 mph (Fujita scale?) and were 65 yards wide.		https://www.abc.net.au/news/2019-12-31/rfs-volunteer-firefighter-dies-in-truck-rollover/11833634 https://www.heraldsun.com.au/news/green-valley-fire-and-presser/video/fcdcc4a5be7027b4fcd812c59d667045 https://www.facebook.com/ashley.drummond.902/videos/2510770992573472/?t=7 https://www.facebook.com/albury.weather/posts/1365585573621246?comment_id=1366028236910313 https://www.facebook.com/photo?fbid=10157302013598635&set=gm.1077614162614148
EF2	12/31/2019	2/0	2:00 am AEDT	-36.299,149.838	Wandella, NSW	What was likely an intense fire tornado tore through rural areas surrounding Wandella NSW. Trees were snapped or uprooted with sheet-metal being wrapped around the trunks, a Ford Falcon sedan was ripped apart with one half being thrown 875 yards, multiple other vehicles were tossed over a hundred yards and debris was blown over a half-mile. Building frames were reportedly moved hundreds of yards.		https://www.canberratimes.com.au/story/6571353/the-night-the-beast-came-to-the-farm/
EF?	8/12/2020	0/0	8:27 pm PDT	34.671,-118.464	Lake Hughes, CA	Multiple videos on social media recorded a large fire tornado developing on a hilltop near Lake Hughes. Unknown if any damage was caused by the fire tornado.		https://twitter.com/latimes/status/1294048843487739910

EF1	8/15/2020	0/0	1:04 pm PDT	39.7239,-120.1303	Loyalton, CA	A powerful supercellular pyro-cumulonimbus spawned 3 fire tornadoes. The NWS issued a tornado warning for this event. 2 of the tornadoes were rated EF1 while the other one was rated as an EFU.		https://twitter.com/MatthewCappucci/status/1294812953754075136 https://twitter.com/nevada_traveler/status/1294799157241118720?s=19 https://twitter.com/chrispipkinwx/status/1294771359663493129?s=21 https://twitter.com/ZavalaLuke/status/1294768945262518272 https://twitter.com/bswinston/status/1294742294315245569?s=21 https://twitter.com/AndClimatology/status/1294763437319426054?s=20 https://twitter.com/NWSReno/status/1294753008916430848 https://twitter.com/brian_brong/status/1301729886973751296
EF2	9/5/2020	0/0	2:17 pm PDT	37.35,-119.34	Mammoth Pool, CA	What might have been a family of 2-3 pyrotornadoes ripped across the Mammoth Pool area. Numerous pine trees were snapped or uprooted with some being debarked.		NEXRAD Storm Reports https://www.youtube.com/watch?v=F5UXmYThocc&ab_channel=ETHAN%E2%80%A2YANG
EF1	9/5/2020	0/0	4:29 pm PDT	37.25,-119.2	Huntington Lake, CA	A brief pyrotornado touched down within Kennolyn Camps on the north shore of Huntington Lake. Hundreds of trees were snapped or uprooted.		https://www.facebook.com/Huntlk Storm Reports
EF1	9/8/2020	0/0	5:47 pm PDT	39.64,-121.188	Nelsons Crossing, CA	Trees were snapped and uprooted in a small path.		Aerial Imagery NEXRAD
EF?	10/17/2020	0/0	2:00 pm MDT	40.143,-105.293	Boulder, CO	Multiple large fire vortices (pyrotornadoes) were observed within a rotating pyrocumulus produced by the Calwood Fire. A tornado-like roar was produced by one of these vortices. The same tornado was accompanied by several satellite vortices.		https://twitter.com/Weather_West/status/1317639324599373824 https://mobile.twitter.com/Weather_West/status/1317668118894759936 https://mobile.twitter.com/mhbare/status/131758622177893990

EF1+	6/29/2021	0/0	3:45 pm PDT	41.755, -122.074	Mt Hebron, CA	Trees were debarked, uprooted, and snapped by a pyrotornado associated with the Tennant Fire.		NEXRAD https://www.facebook.com/1513963317/videos/362604515435287/
EF?	7/10/2021	0/0	3:56 pm PDT	39.9745, -120.082	Doyle, CA	The Sugar Fire produced a strong and tight couplet likely a fire tornado. Video evidence shows what appears to be a strong fire whirl near this couplet that lofts building debris.		https://www.instagram.com/p/CRK9dzGh2Sk/?fbclid=IwAR3flaVMiQPstYxHD97_7Ve2JpaSDrYTS-Bc5J06KWAaPM_27H6tdqAu100
EF2	7/18/2021	0/0	~7:00 pm PDT	42.570, -120.725	Fremont National Forest, OR	A large and significant fire tornado developed during the Bootleg Fire and moved NE. Significant tree damage occurred as a large swath of trees were blown down with some trees being severely debarked or snapped off near the ground. The soil was scoured down to hardpan and asphalt from a road was scoured too.		
EF?	7/18/2021	0/0	5:13 pm PDT	39.989, -121.291	Rock Creek Reservoir, CA	Radar data showed a tornadic couplet near the Rock Creek Reservoir while the Dixie Fire was producing a pyrocumulonimbus.		
EF?	9/7/2021	0/0	7:06 pm PDT	41.077, -122.796	Coffee, CA	Radar data showed a tornadic couplet associated with the River Complex fire.		