Motion 16199

King County

REPETITIVE LOSS AREA ANALYSIS

External Version
July 26, 2022

PERTEET

OSG
O'Neill Service Group

King County, Washington

REPETITIVE LOSS AREA ANALYSIS

External Version
July 26, 2022

King County Department of Natural Resources and Parks
Water and Land Resources Division

River and Floodplain Management Section
King Street Center, KSC-NR-0600
201 South Jackson Street, Suite 600
Seattle, WA 98104-3855
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Alternate Formats Available
206-477-4812 TYY Relay: 711

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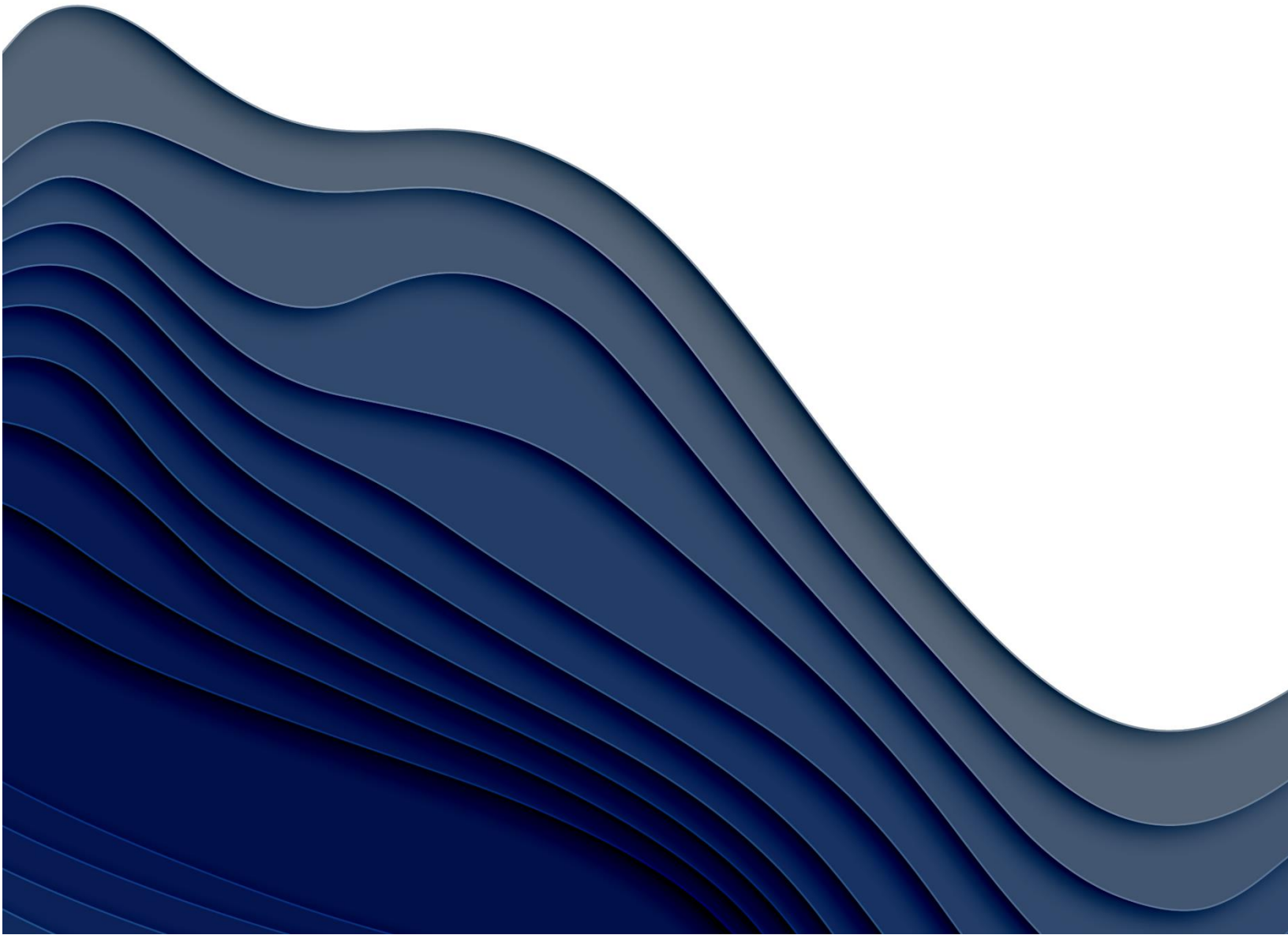


INTRODUCTION

Flooding is one of the most common natural hazards in the United States. More than 20,000 communities experience floods and this hazard accounts for more than 70 percent of all Presidential Disaster Declarations. In the United States, over eight million residential and commercial structures are currently built in areas at risk to flooding. The cost of recovery is spread over local, state, and federal governments and the victims themselves, who are directly affected by these disasters.

The National Flood Insurance Program (NFIP) is continually faced with the challenge of balancing the financial soundness of the program with the competing expectation of keeping premiums affordable. Repetitive loss properties are one of the two largest obstacles to achieving financial soundness of the NFIP. Since the inception of the NFIP, almost $12.5 billion have been paid to repetitive loss properties, about one-fourth of all NFIP payments. There are currently about 160,000 repetitive loss properties in the US. About 10,000 of those properties are considered to be severe repetitive loss properties. Even though only about 44% of the repetitive loss properties are insured, they are still a drain on the NFIP. Currently, repetitive loss properties represent 1.3% of all policies, but account for 15% to 20% of flood claims.

TERMINOLOGY

REPETITIVE LOSS*:* Any insurable building for which the NFIP paid two or more claims of more than $1,000 within any 10-year period since 1978.

SEVERE REPETITIVE LOSS*:* Any insurable building for which the NFIP paid four or more claims of more than $5,000 or paid at least two claims that cumulatively exceed the building's value.

REPETITIVE LOSS PROPERTIES IN KING COUNTY

King County, Washington (Community Number 530071) has been a regular participant in the NFIP since September 29, 1978. In addition to meeting the basic requirements of the NFIP, the County has taken additional steps to participate in the Community Rating System (CRS) program. King County is currently a CRS Class 2 community which rewards all NFIP policyholders with a 40 percent reduction in their flood insurance premiums. King County has been participating in the CRS program since October 1, 1991.

As of January 2, 2022, there are currently 1,541 NFIP Polices in force in King County with a total annual premium of $1.5 million and coverage of $429 million. The County has 1,327 paid losses against the NFIP totaling more than $21.8 million. Of those losses, 500 are from repetitive loss properties with losses totaling $12.9 million, or almost 60 percent of the total losses.

Once a property is designated as a repetitive loss property it stays on the list until it has been mitigated, even if the property sells to a new owner or the owner drops the flood insurance policy. According to repetitive loss data received from FEMA as of April 21, 2022, there are a total of 166 repetitive loss properties within unincorporated King County. Exhibit 1 breaks down those properties into their classifications.

Exhibit 1. Repetitive Loss Statistics.

Classification	Unmitigated	Mitigated	Total Repetitive Loss Properties	Total Losses	Total Claims Paid (millions)
Repetitive Loss	80	56	136	347	$7.9
Severe Repetitive Loss	8	22	30	153	$5.0
TOTAL	**88**	**78**	**166**	**500**	**$12.9**

CRS REPETITIVE LOSS REQUIREMENT

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since many of the losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities:

- **Category A:** A community with no unmitigated repetitive loss properties. No special requirements from the CRS.
- **Category B:** A community with at least one, but fewer than 50, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the showing the location of all repetitive loss properties (areas) and complete an annual outreach activity directed to repetitive loss properties.
- **Category C:** A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss properties (areas) or prepare a RLAA for all repetitive loss areas.

Because the latest repetitive loss data obtained from FEMA for King County contained a total of 88 unmitigated repetitive loss properties, King County is designated as a Category C repetitive loss community.

SETTING

King County is located in the Puget Sound region of Washington State. It is bounded by Snohomish County to the north, Kitsap County to the west, Kittitas County to the east, and Pierce County to the south, along with a sharing a small border with Chelan County to the northeast. It also includes Vashon Island and Maury Island in Puget Sound. According to the US Census Bureau, King County has a total area of 2,307 square miles, of which approximately 2,116 square miles are land area, and 191 square miles are water area. This analysis covers only the unincorporated areas of King County.

King County has a mild Pacific maritime climate, which means its weather is heavily influenced by atmospheric conditions over the Pacific Ocean. About two-thirds of the Pacific Northwest precipitation occurs during half of the year from October through March, due to the Pacific storm track, and much of this precipitation is captured in the mountains. Precipitation declines from late spring to early fall with high pressure systems to the west, generally keeping the region fairly dry with pleasant summertime temperatures. On average, King County gets about 46 inches of precipitation every year.

Exhibit 2 depicts King County's location as well as the incorporated municipalities and major roads. Exhibit 3 depicts the major drainage basins that cover the County.

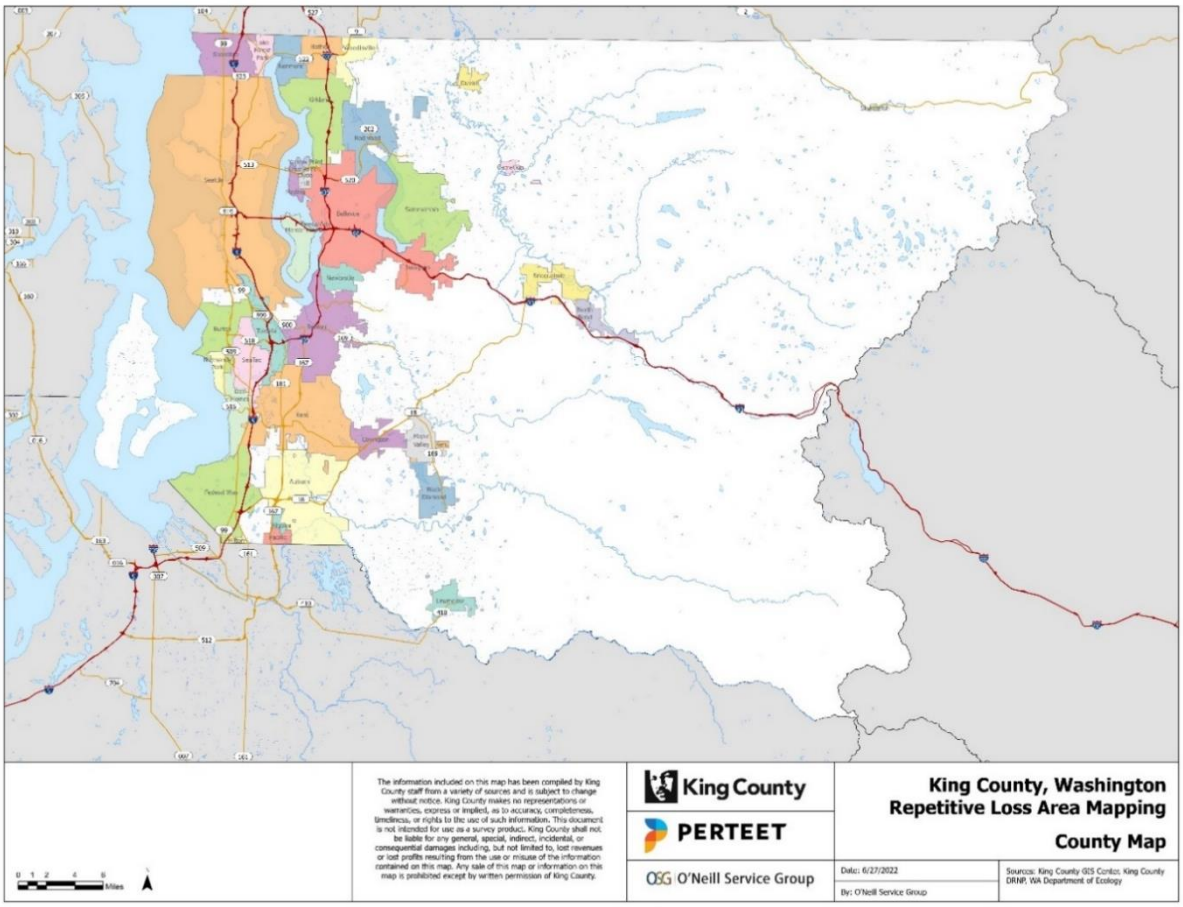


Exhibit 2. King County Map.

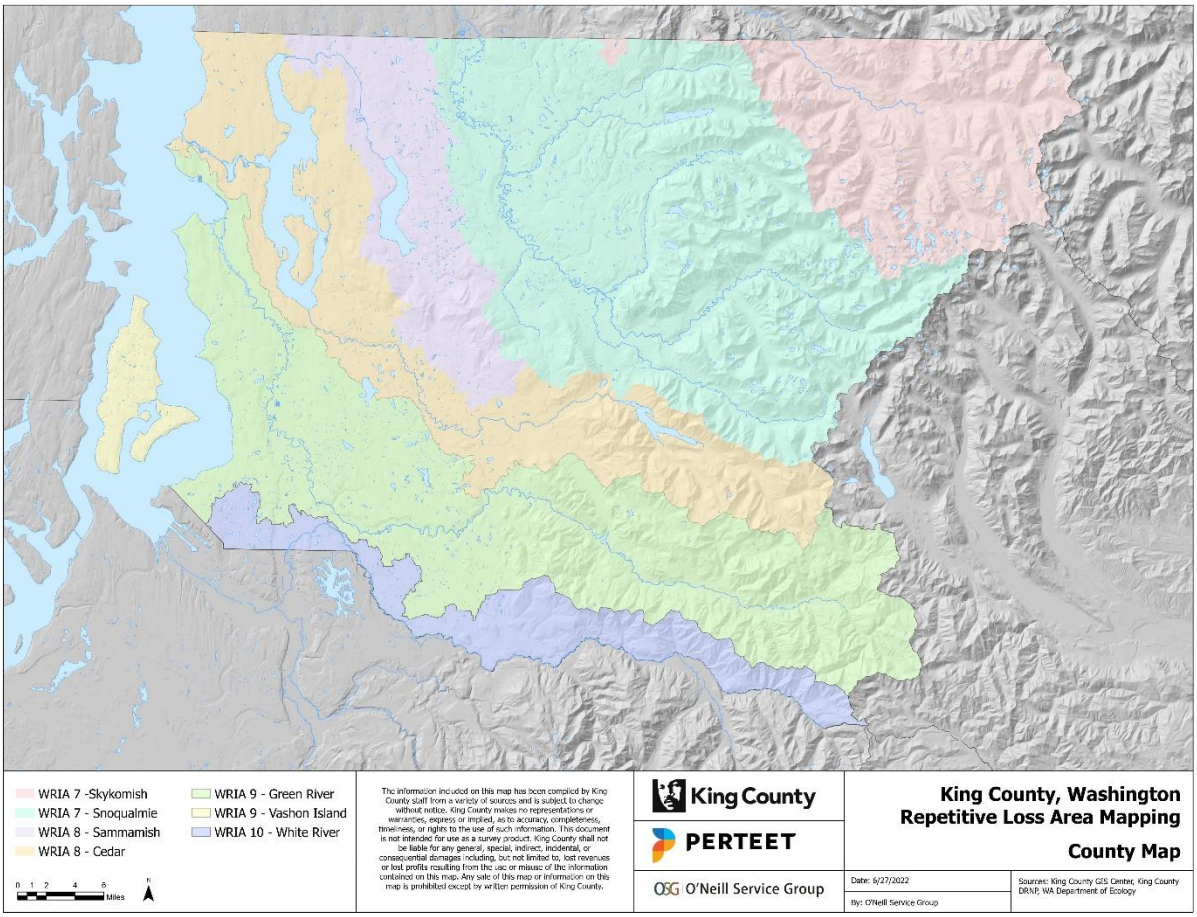


Exhibit 3. King County WRIA Basin Map.

IDENTIFYING REPETITIVE LOSS AREAS

Before identifying repetitive loss areas, King County reviewed the repetitive loss data provided by FEMA to ensure accuracy. The initial list of repetitive loss properties included 186 properties assigned to the unincorporated county. During review, the County found that 22 of the properties are located within cities or other counties, one property is listed twice, and 20 properties have been mitigated that were listed as unmitigated. These corrections reduced the number of unmitigated repetitive loss properties to 88. Of those 88 properties, several had incorrect identifying information, such as old addresses or incorrect latitude and longitude. The County's CRS Coordinator will address these corrections and updates through the NFIP Repetitive Loss Update Worksheet (AW-501) process.

After the repetitive loss properties were checked for accuracy and mapped using latitude and longitude, King County staff identified 42 repetitive loss areas in accordance with the principles outlined in the CRS guidance titled *Developing a Repetitive Loss Area Analysis, 2017*. The 42 repetitive loss areas include 88 unmitigated repetitive loss properties plus an additional 523 properties that have the same or similar flood conditions but have either been mitigated, constructed to higher standards, or do not have repetitive claims paid against the NFIP. Therefore, a total of 611 properties are included within this RLAA.

The repetitive loss areas are organized by drainage basin, also known as a watershed. Within King County, there are there are nine basins total, and seven basins with repetitive loss properties, as shown in Exhibit 4.

Exhibit 4. Repetitive Loss Properties per Basin.

Basin	Repetitive Loss Properties		Other Properties	Total Properties[1]
	Unmitigated	Mitigated		
Sammamish River Basin	3	1	0	**3**
Skykomish River Basin	6	8	34	**40**
Green River Basin	5	0	16	**21**
Vashon Island (Central Puget Sound)	3	0	28	**31**
Cedar River Basin	6	14	59	**65**
Snoqualmie River Basin	65	54	386	**451**
White River Basin	0	1	0	**0**
TOTAL	**88**	**78**	**523**	**611**

[1] Total properties in repetitive loss areas. Many mitigated properties are not within repetitive loss areas and were not included in this analysis. The mitigated properties within the repetitive loss areas are included in the Other Properties total.

King County River and Floodplain Management Section assigns a basin lead and support staff to each drainage basin that comprise a "basin team." The basin teams are very familiar with the repetitive loss properties and areas and the cause of flooding within their basin. To determine the repetitive loss areas, the basin teams met with the CRS Coordinator and consultant staff to discuss each of the repetitive loss properties.

Prior to meeting with the basin teams, the consultant staff reviewed the data and identified clusters of mitigated and unmitigated repetitive loss properties. These clusters were easily distinguished and generally in two categories:

- Repetitive loss properties in neighborhoods alongside the river, comprised of small, urban sized lots. Many of these areas were subdivided in the 1930s, 40s, and 50s, before subdivision

regulations, zoning codes, and environmental restrictions existed. Initially intended to be recreational lots where families from the cities could get away to their cabin, many property owners eventually built larger homes and became full-time residents. This was encouraged by the improvement of road and other infrastructure systems, expansion of the suburbs, and river management policies of the time that focused on keeping the flow within the channel through frequent dredging and construction of levees, river training structures, and reservoirs.

- Repetitive loss properties in agricultural areas, primarily along the lower Snoqualmie River. This area's expansive fertile soil is King County's leading agricultural area, and also the County's leading repetitive loss area.

The consultant team also identified repetitive loss properties that were individual and did not include adjacent properties with similar flood risks. In accordance with the Privacy Act of 1974, specific identifying details on individual repetitive loss properties will not be shared with the general public.

The basin teams used several sources of information to determine the boundaries of the repetitive loss areas, including:

- Location of repetitive loss properties
- Aerial photos of flood events spanning from the 1990s to current
- Firsthand knowledge from previous experience and communications with landowners
- King County Flood Warning System flood phases
- FEMA floodplain boundaries, effective and preliminary
- Flood studies and historical flood simulation models
- Elevation certificates
- Aerial photo basemaps from 1998 to 2022
- Hillshade basemaps derived from LiDAR
- County assessor data and parcel boundaries
- Google Street View
- Drainage complaint records
- Watercourse and waterbody data
- Field surveys

An overview map of the King County Repetitive Loss Areas is shown in Exhibit 5 on the following page.

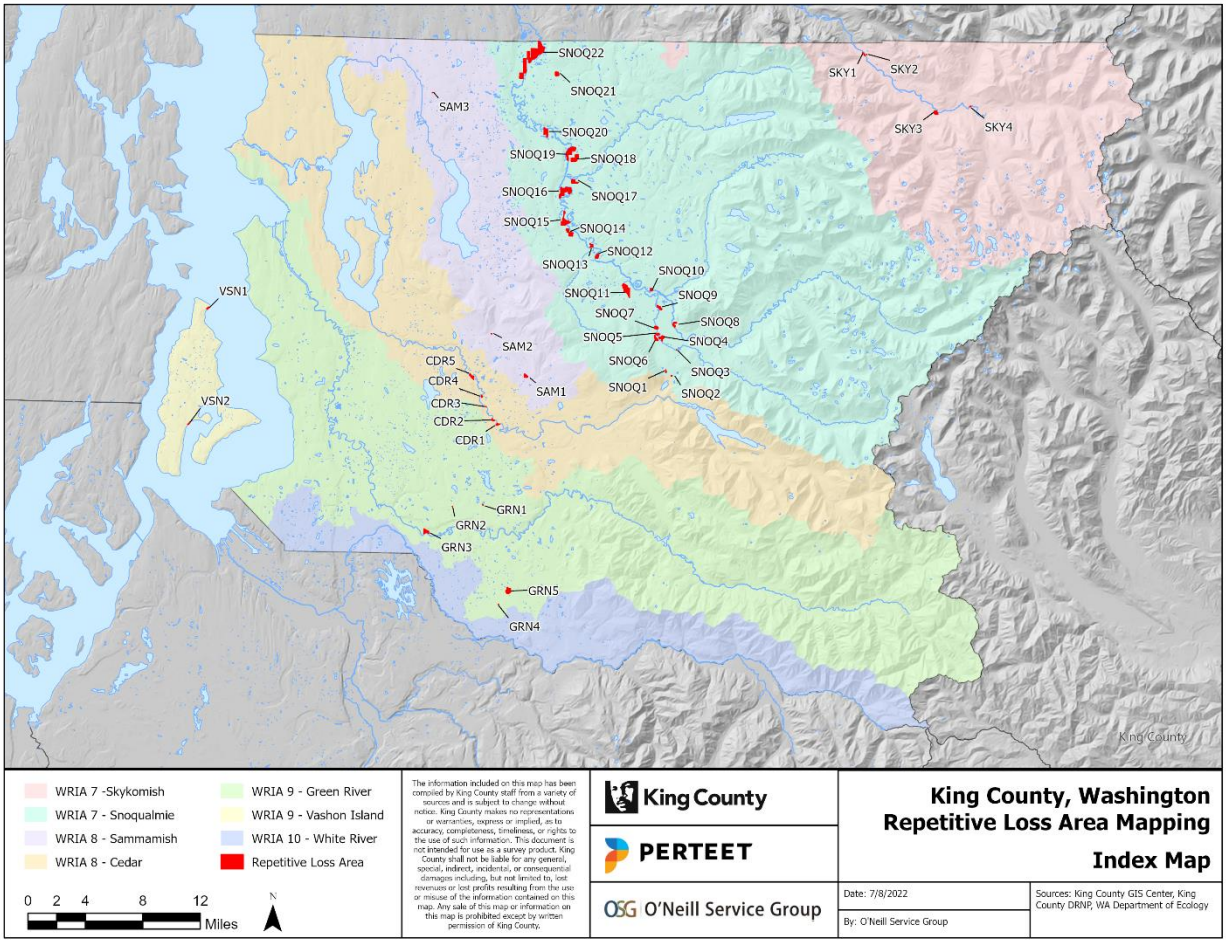


Exhibit 5. King County Repetitive Loss Areas.

REPETITIVE LOSS AREA ANALYSIS PLANNING PROCESS

The RLAA planning process incorporated requirements from Section 510 of the 2017 *CRS Coordinator's Manual* and the Activity 510 guidance document from 2017, *Developing a Repetitive Loss Area Analysis*. This RLAA included all five planning steps included in the 2017 *CRS Coordinator's Manual* and guidance document:

Step 1: Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

Step 2: Contact agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

Step 3: Visit each building in the repetitive loss area and collect basic data.

Step 4: Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

Step 5: Document the findings. A separate analysis report must be conducted for each area.

Beyond the five planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503.
2. The repetitive loss area must be mapped as described in Section 503.a. A Category "C" community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.

Repetitive Loss Area Analysis Approval

Prior to approval by CRS, the RLAA must be made available to the owners of the properties in the RLAA for review and comment, and the County Council must adopt the plan.

On July 11, 2022, King County released the Draft RLAA to interested repetitive loss area property owners and posted the RLAA on the County website. The comment period ended on July 21, 2022.

The County received one comment on the draft RLAA from a landowner in the Snoqualmie Basin. The commenter provided additional information regarding the cause of flooding in their area and concerns about future development. The comments have been incorporated into the RLAA.

PART 2
Five Step Process

STEP 1. ADVISE ALL PROPERTY OWNERS

Property Owner Notification

The County mailed letters to all property owners and residents within the 41 identified repetitive loss areas on June 13, 2022. Exhibits 6 and 7 show the property owner notification letter (full size letter is in Appendix A). All properties in the repetitive loss area received the letter in both English and Spanish and regardless of their level of protection (e.g., mitigated or built to a higher standard). In accordance with the Privacy Act of 1974, the mailing list will not be shared with the general public.

The letter included a request for the property owner to provide information about flooding on their property or in their repetitive loss area by completing a survey. The letter provided several options, including a paper version of the survey that could be mailed back, a link and QR code for the online version, and phone number and email for the CRS Coordinator. The survey asked several questions about their experience with past flooding and whether or not they have flood insurance or are interested in mitigation.

Survey Results

Repetitive loss property owners submitted 51 survey responses. The property owners who completed the survey live in the Snoqualmie, Cedar, Skykomish, and Green basins. The complete survey results are in Appendix B. A summary of survey results is provided in Exhibit 8.

KING COUNTY FLOOD CONTROL DISTRICT | King County

Water and Land Resources Division
Service provider to the King County Flood Control District
Department of Natural Resources and Parks
King Street Center
201 South Jackson Street, Mailstop 5600
Seattle, WA 98104-3855
206-477-4800 Fax 206-296-0192
TTY Relay: 711

June 13, 2022

Address
City, State Zip Code

Dear Property Owner or Resident,

At King County, we're concerned about flooding on properties and working to better understand where and how it happens. You have received this letter because your property is in a Repetitive Loss Area that has flooded several times. This does not mean that your property has flooded, only that it is in the same neighborhood as a property that has flooded multiple times. While we work to reduce flood risks, here are things you can do to prepare and help protect yourself from floods:

1. **Tell us about flooding at your property and what you think causes it.** Take our online survey at: surveymonkey.com/r/KC_RLAA. You can also share your responses by completing the enclosed survey below and returning it by mail. **Surveys must be completed and returned by June 30, 2022.** We encourage you to provide any relevant flood information.

Scan with smart phone

To help determine causes of repeated flooding, King County field teams will visit your neighborhood over the next two weeks to assess the flood risk and to take photographs. Field staff will not access your property and will only gather information viewable from the street. Staff will be looking at drainage patterns to identify possible sources of flooding (rivers, streams, ditches, ponding water, etc.) as well as the type and condition of building foundations.

Once our evaluation is complete, we will provide a draft copy of the report to survey participants and will be accepting your feedback. If you would like a copy of the draft report, please provide your email address within the survey.

2. **Buy flood insurance:** Homeowners or renters insurance does not cover loss caused by flooding. Purchasing flood insurance is important. Your property is eligible for a 40 percent flood insurance premium discount. Flood insurance to protect contents is available to both renters and property owners. To learn more visit floodsmart.gov, talk to your insurance agent, or contact me.

3. **Prepare for flooding:**
   - Sign up for King County Flood Alerts by visiting kingcounty.gov/flood and download the King County Flood Warning mobile app to find out when rivers are rising.
   - Update your emergency plans and put together an emergency kit.

- Know how to shut off the electricity and gas to your house before a flood event.
- Store valuables and household chemicals above flood levels.

4. **Protect your property from flooding:**
   - Move vehicles, equipment, livestock, or pets to higher ground.
   - Anchor and secure propane tanks and other fuel containers.
   - Install a floor drain plug or sewer backup valve.
   - Keep street drains, storm grates and flap gates free of leaves and debris.
   - Consider elevating your property. Learn more at kingcounty.gov/buyout-elevation.

Thank you for your interest and support in reducing repetitive flood losses in your neighborhood! Together we can help minimize flood losses and maximize the safety and enjoyment of your home.

If you have any questions or would prefer to respond to the survey by phone, please feel free to contact me directly at 206-477-7568 or lahendrix@kingcounty.gov. I look forward to hearing from you.

Sincerely,

Laura Hendrix, CFM
Floodplain Management Planner

Alternative Formats Available

Interpretation and translation services are available to you at no cost. If you need them, please contact us at lahendrix@kingcounty.gov or 206-477-7568 (TTY) Relay: 711.

King County Repetitive Loss Area Analysis

You can respond to the survey online at **surveymonkey.com/r/KC_RLAA** or fill out the hard copy below. Please return your responses by June 30, 2022 to:
Attn: Laura Hendrix
King County Water and Land Resources Division
201 South Jackson Street, Suite 5600
Seattle, WA 98104

Scan with smart phone

1. Please provide your address. Your response will be used by King County to better understand the flooding in your area.

Address:_____

2. If you would like to review the draft Repetitive Loss Area Analysis, please provide your email address.

Email address:_____

3. How many years have you lived at this address or owned the property? Select one.
- ☐ Less than 1 year
- ☐ 1-5 years
- ☐ 5-10 years
- ☐ 10+ years

4. Do you rent or own the property? Select one.
- ☐ Rent
- ☐ Own

5. What type of foundation does the home/building have? Select all that apply.
- ☐ Slab
- ☐ Crawlspace
- ☐ Basement
- ☐ Ground floor garage
- ☐ Piers
- ☐ I don't know

6. Has the home/building or property ever flooded or had a water problem? Select one.
- ☐ Yes
- ☐ No (if "no," skip to question 10)
- ☐ I don't know

7. In what year(s) did it flood? Please list all years.

_____

8. Where did you get flood water and how deep was it? Circle the depth in each location.

In the basement	No flood water	Less than 1 foot	1-2 feet	3-4 feet	5+ feet
In the crawlspace	No flood water	Less than 1 foot	1-2 feet	3-4 feet	5+ feet
In the first floor	No flood water	Less than 1 foot	1-2 feet	3-4 feet	5+ feet
In the yard/field only	No flood water	Less than 1 foot	1-2 feet	3-4 feet	5+ feet

9. If flood water entered your home/building, how long did it stay?
- ☐ Less than 1 day
- ☐ 1-2 days
- ☐ 3+ days

10. What do you think causes the flooding in your area? Check all that apply.
- ☐ Flooding from a waterbody (river, creek, lake, etc.)
- ☐ Saturated ground / ground water
- ☐ Blocked or undersized drainages/ditches/stormwater system
- ☐ Other (please specify)

11. What flood protection measures have you installed on your property? Check all that apply.
- ☐ Sump pump
- ☐ Waterproofed the outside walls
- ☐ Re-graded yard to keep flood water away
- ☐ Moved things out of basement
- ☐ Backup power system/generator
- ☐ Elevated structure
- ☐ Other (please specify)

12. Is the home/building located in the 1% chance floodplain (also known as the FEMA 100-year floodplain)? Select one.
- ☐ Yes
- ☐ No
- ☐ I don't know

13. Do you have FEMA flood insurance? Select one.
- ☐ Yes
- ☐ No
- ☐ I don't know

14. Please provide any additional information or comments you have about flooding in your area.

_____

15. Would you like to receive additional information about how you can protect your home/building from flooding?
- ☐ No
- ☐ Yes, please contact me with more information.

Exhibit 6. Property Owner Notification Letter (English).

KING COUNTY FLOOD CONTROL DISTRICT
King County

Water and Land Resources Division
Services provided to the King County Flood Control District
Department of Natural Resources and Parks
King Street Center
201 South Jackson Street, Mailstop 5600
Seattle, WA 98104-3855
206-477-4800 Fax 206-296-0192
TTY Relay: 711

Estimado/a propietario/a o residente:

En el Condado de King estamos preocupados por las inundaciones en propiedades y estamos trabajando para entender mejor dónde y cómo ocurren. Usted ha recibido esta carta debido a que su propiedad está en un Área de Pérdida Repetitiva que se ha inundado varias veces. Esto no significa que su propiedad se haya inundado, solo que está en el mismo vecindario de una propiedad que se ha inundado en múltiples ocasiones. Mientras trabajamos para reducir los riesgos de inundaciones, aquí hay cosas que puede hacer para prepararse y ayudar a protegerse de las inundaciones:

1. **Díganos sobre las inundaciones en su propiedad y sobre lo que usted piensa que las causan.** Tome la encuesta en línea en: surveymonkey.com/r/AAPR. También puede compartir sus respuestas al completar la encuesta adjunta a continuación y devolverla por correo postal. **Las encuestas deben completarse y devolverse a más tardar el 30 de junio de 2022.** Le motivamos a que nos comparta cualquier información relevante a las inundaciones.

Escanear con el teléfono

Para ayudar a determinar las causas de las inundaciones recurrentes, los equipos en campo del Condado de King visitarán su vecindario en las próximas dos semanas para evaluar los riesgos de inundación y para tomar fotografías. El personal en campo no accederá a su propiedad y solo recabará información visible desde la calle. El personal estará buscando a patrones de drenaje para identificar posibles fuentes de inundaciones (ríos, arroyos, diques, agua estancada, etc.) así como el tipo y condición de los cimientos de la construcción.

Una vez que se complete la evaluación, le otorgaremos un borrador del reporte a los participantes de la encuesta y aceptaremos sus comentarios. Si quiere una copia del borrador del reporte, por favor, otorgue su dirección de correo electrónico junto con la encuesta.

2. **Compre seguro para inundaciones:** El seguro para propietarios o arrendatarios de vivienda, no cubre las pérdidas causadas por las inundaciones. Comprar un seguro para inundaciones es importante. Su propiedad es elegible para un descuento de 40 por ciento de la prima del seguro para inundaciones. El seguro para inundaciones para proteger los contenidos de su propiedad está disponible tanto para arrendatarios como para propietarios de vivienda. Para obtener más información, visite floodsmart.gov, hable con su agente de seguro o contácteme.

3. **Prepárese para las inundaciones:**
   - Regístrese para recibir Alertas de Inundaciones en el Condado de King al visitar kingcounty.gov/flood y descargue la aplicación móvil de Advertencia de Inundaciones del Condado de King para saber cuándo está subiendo el nivel de los ríos.
   - Actualice sus planes de emergencia y prepare un kit de emergencia.
   - Sepa cómo cortar la electricidad y el gas de su casa antes de un evento de inundación.
   - Guarde los objetos de valor y las sustancias químicas para la casa arriba de los niveles del suelo.

4. **Proteja su propiedad en contra de inundaciones:**
   - Mueva los vehículos, equipo, ganado o mascotas a una zona más alta.
   - Ancle y asegure los tanques de propano y otros contenedores de combustible.
   - Instale un tapón de desagüe en el piso o una válvula antirretorno de drenaje.
   - Mantenga las alcantarillas de la calle, las rejillas y compuertas para el desagüe libres de hojas y basura.
   - Considere elevar el nivel de su propiedad. Obtenga más información en kingcounty.gov/buyout-elevation.

¡Gracias por su interés y apoyo para reducir las pérdidas repetitivas por inundaciones en su vecindario! Juntos, podemos minimizar las pérdidas por inundaciones y maximizar la seguridad y el disfrute de su casa.

Si tiene preguntas o si prefiere responder a la encuesta por teléfono, por favor, no dude en contactarme directamente al 206-477-7568 o a lahendrix@kingcounty.gov. Espero saber de usted.

Atentamente,

Laura Hendrix, CFM
Planeadora de Gestión de Terrenos Inundables

Formatos Alternativos Disponibles

Hay servicios de interpretación y traducción disponibles para usted, sin costo. Si los necesita, por favor, contáctenos a lahendrix@kingcounty.gov o al 206-477-7568 Retransmisión TTY: 711.

Análisis del Área de Pérdida Repetitiva del Condado de King

Puede responder a la encuesta en línea en **surveymonkey.com/r/AAPR** o llenar la siguiente copia en papel. Por favor, devuelva las respuestas a más tardar el 30 de junio de 2022 a:

Attn: Laura Hendrix
King County Water and Land Resources Division
201 South Jackson Street, Suite 5600
Seattle, WA 98104

Escanear con el teléfono

1. Por favor, otorgue su dirección. Su respuesta será usada por el Condado de King para entender mejor las inundaciones en su área.

Dirección: _____

5. Si quiere revisar el borrador del Análisis del Área de Pérdida Repetitiva, por favor, agregue su correo electrónico.

Correo electrónico: _____

6. ¿Cuántos años ha vivido en esta dirección o ha sido dueño/a de la propiedad? Seleccione uno

- ☐ Menos de 1 año
- ☐ 1-5 años
- ☐ 5-10 años
- ☐ Más de 10 años

7. ¿Usted renta o es dueño/a de la propiedad? Seleccione una opción.

- ☐ Renta
- ☐ Soy dueño/a

8. ¿Qué tipo de cimientos tiene la casa/edificio? Selecciona todas las opciones que correspondan.

- ☐ Losa de concreto
- ☐ Bloques y con espacio entre el suelo y la construcción
- ☐ Sótano
- ☐ Cochera en el primer piso
- ☐ Pilares
- ☐ No sé

9. ¿La casa/edificio o propiedad alguna vez se ha inundado o ha tenido un problema de agua? Seleccione una opción.

- ☐ Sí
- ☐ No (en caso que "no," pase a la pregunta 10)
- ☐ No sé

10. ¿En qué año(s) se inundó? Por favor, indique todos los años.

_____

11. ¿En qué parte tuvo agua de inundación y qué tan profunda estaba? Circule la profundidad en cada lugar.

En el sótano	No ha habido agua de inundación	Menos de 1 pie	1-2 pies	3-4 pies	Más de 5 pies
En el espacio entre el suelo y la casa	No ha habido agua de inundación	Menos de 1 pie	1-2 pies	3-4 pies	Más de 5 pies
En el primer piso	No ha habido agua de inundación	Menos de 1 pie	1-2 pies	3-4 pies	Más de 5 pies
Solo en el patio/campo	No ha habido agua de inundación	Menos de 1 pie	1-2 pies	3-4 pies	Más de 5 pies

12. Si el agua de inundación entró a su casa/edificio, ¿por cuánto tiempo permaneció ahí?

- ☐ Menos de 1 día
- ☐ 1-2 días
- ☐ Más de 3 días

13. ¿Qué es lo que cree que causa las inundaciones en su área? Marque todas las opciones que correspondan.

- ☐ Inundaciones a partir de un cuerpo de agua (río, arroyo, lago, etc.)
- ☐ Terreno saturado / agua subterránea
- ☐ Drenajes/diques/ sistemas para agua pluvial bloqueados o de tamaño insuficiente
- ☐ Otro (por favor, especifique)

14. ¿Qué medidas de protección en contra de las inundaciones ha instalado usted en su propiedad? Marque todas las opciones que correspondan.

- ☐ Bomba de sumidero
- ☐ Paredes exteriores en contra del agua
- ☐ Nivelación del patio para alejar el agua
- ☐ Sacar las cosas del sótano
- ☐ Sistema de energía de respaldo/generador
- ☐ Estructura elevada
- ☐ Otro (por favor, especifique)

15. ¿Está la casa/edificio ubicado en un terreno inundable con 1 % de posibilidad (también conocido como terrenos inundables de 100 años de FEMA)? Seleccione una opción.

- ☐ Sí
- ☐ No
- ☐ No sé

16. ¿Tiene seguro para inundaciones de FEMA? Seleccione una opción.

- ☐ Sí
- ☐ No
- ☐ No sé

17. Por favor, agregue cualquier información adicional o comentarios que tenga sobre las inundaciones en su área.

_____

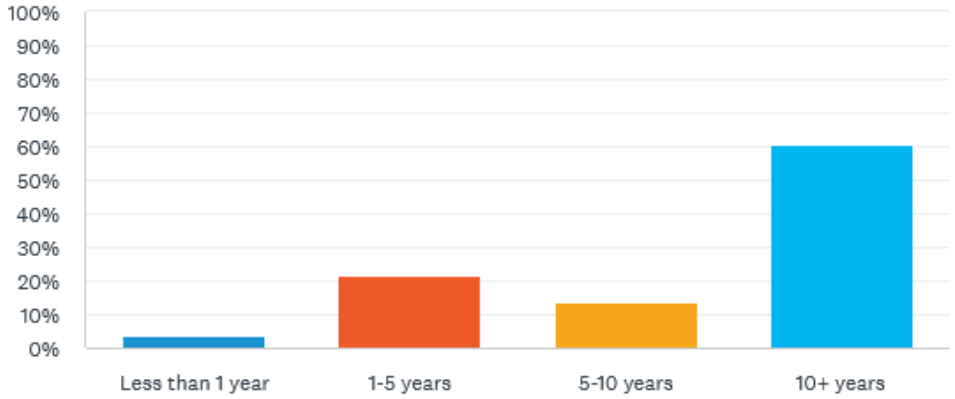
18. ¿Le gustaría recibir información adicional sobre cómo puede proteger su casa/edificio en contra de inundaciones?

- ☐ No
- ☐ Sí, por favor, contáctenme con más información.

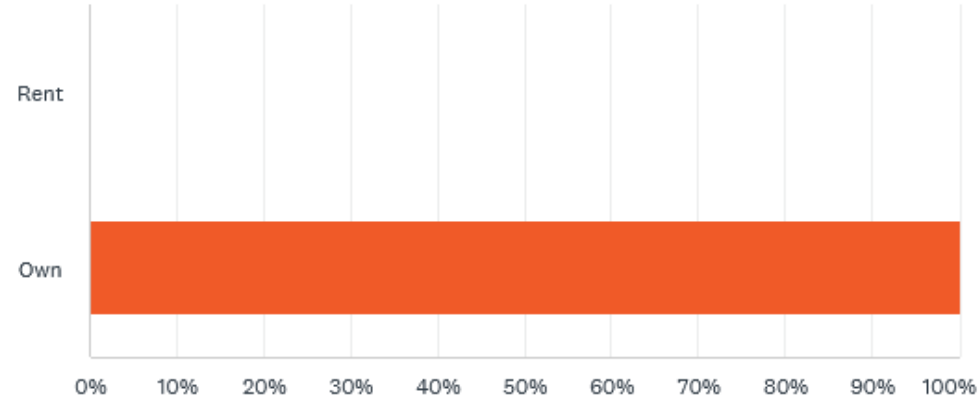
Exhibit 7. Property Owner Notification Letter (Spanish).

Exhibit 8. Survey Results.

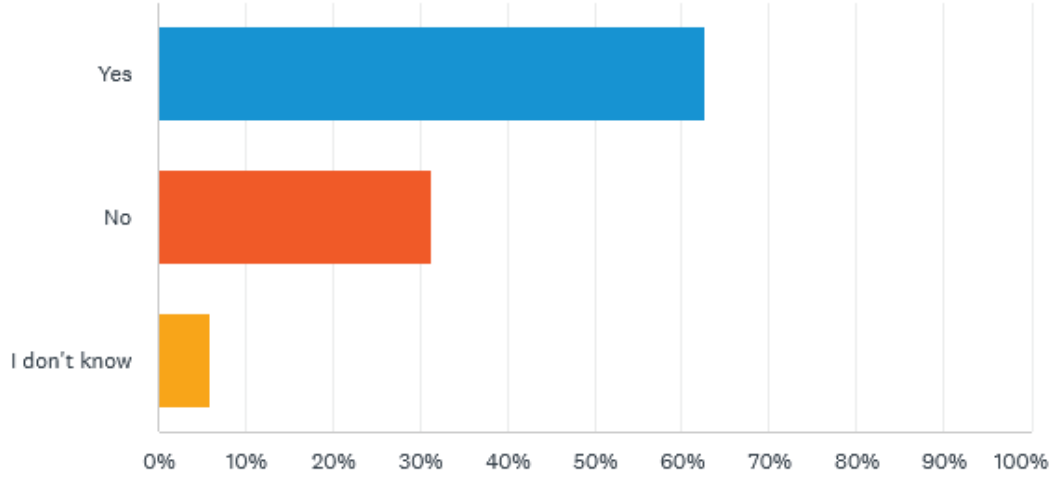
How many years have you lived at this address or owned the property?



Do you rent or own the property?

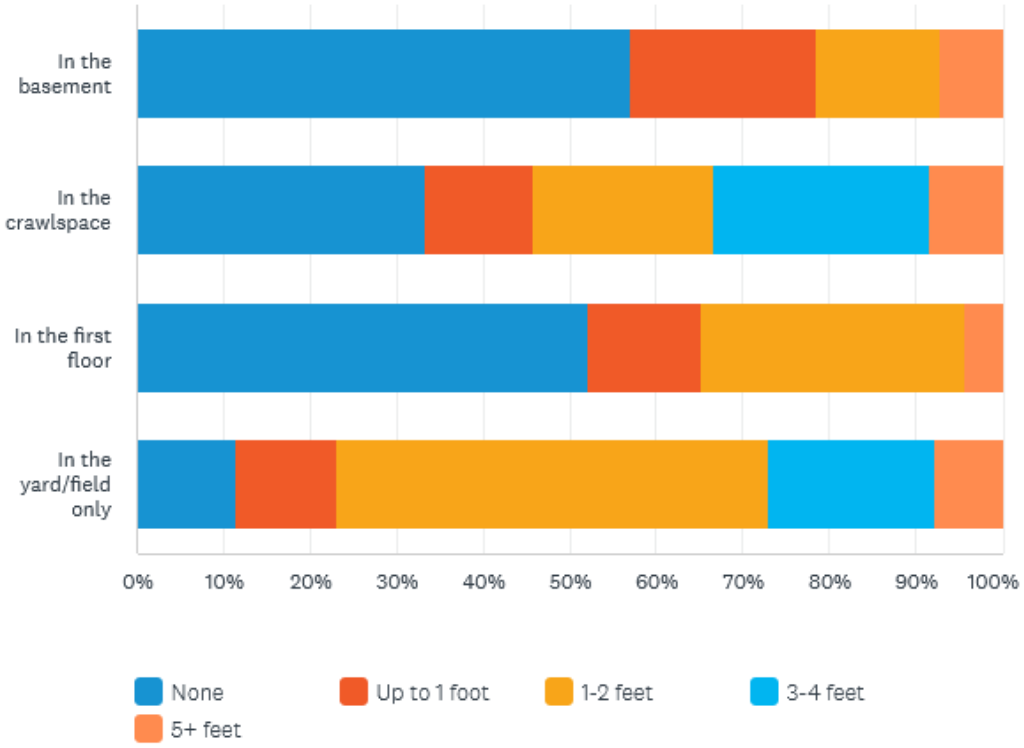


Has the home/building or property ever flooded or had a water problem?

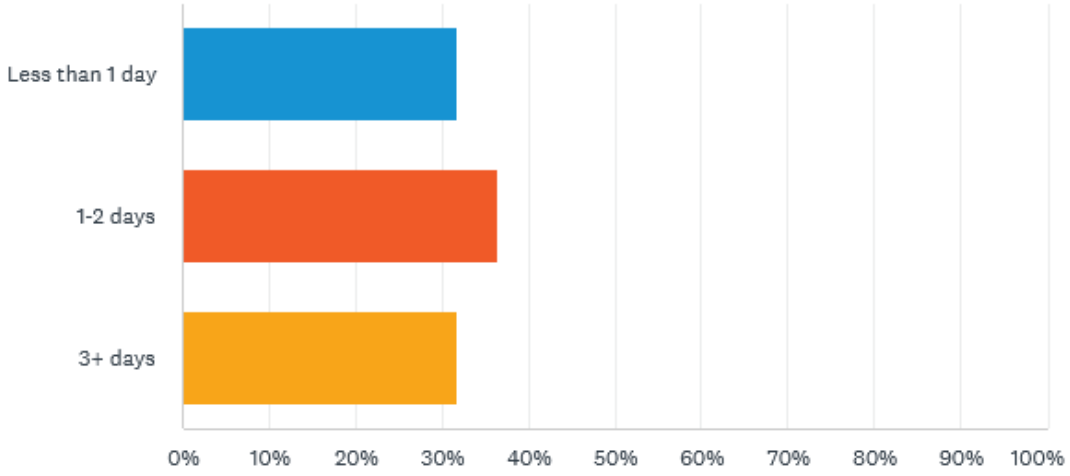


In what year(s) did it flood?

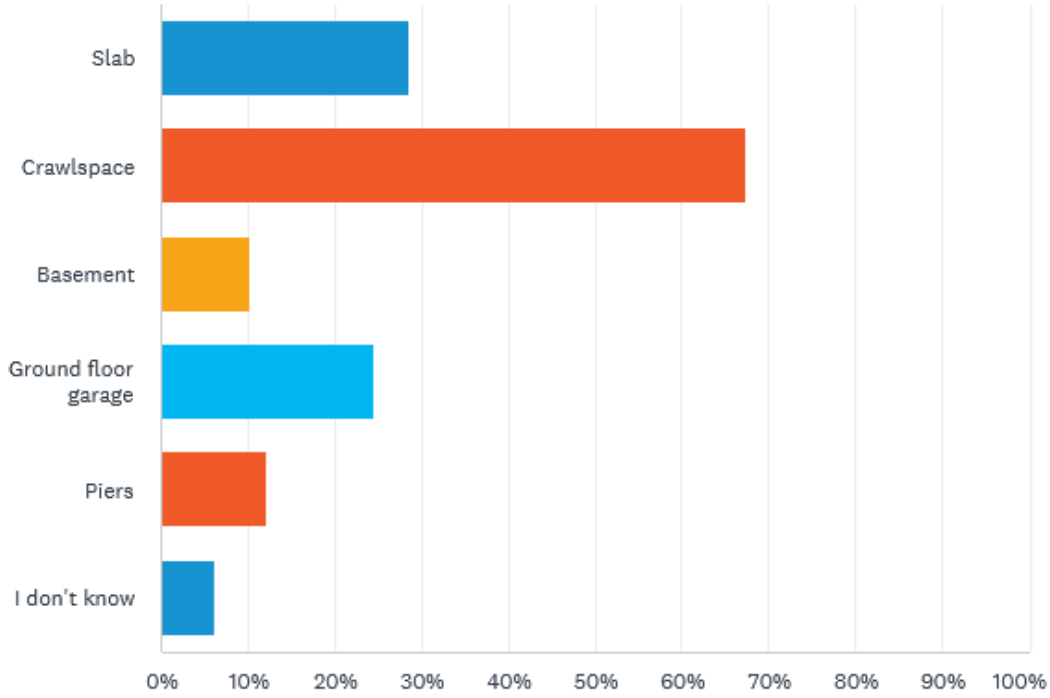
Where did you get flood water and how deep was it?



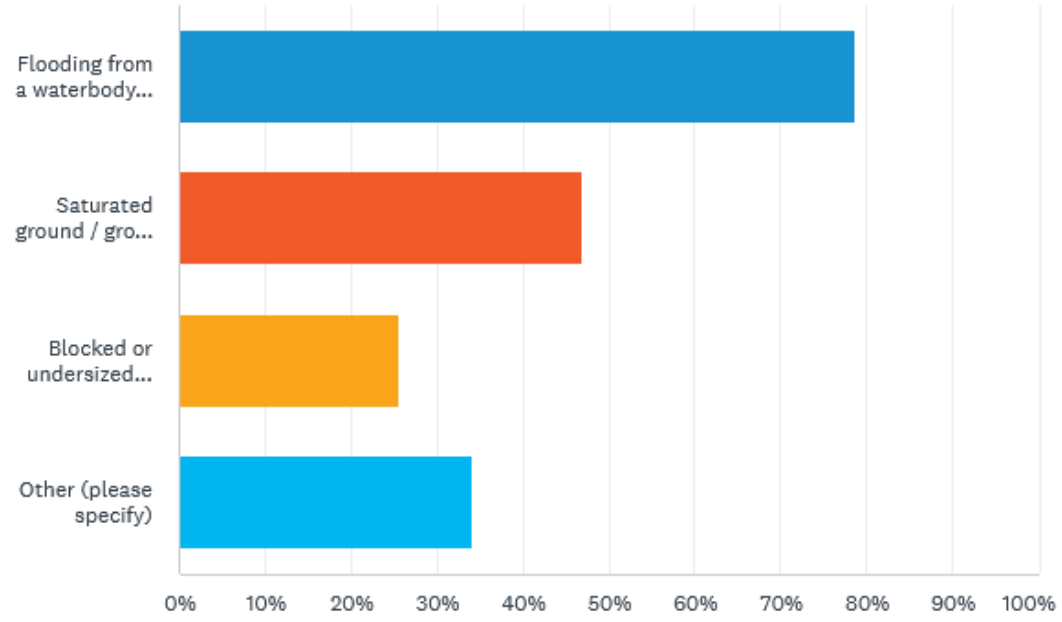
If flood water entered your home/building, how long did it stay?



What type of foundation does the home/building have?

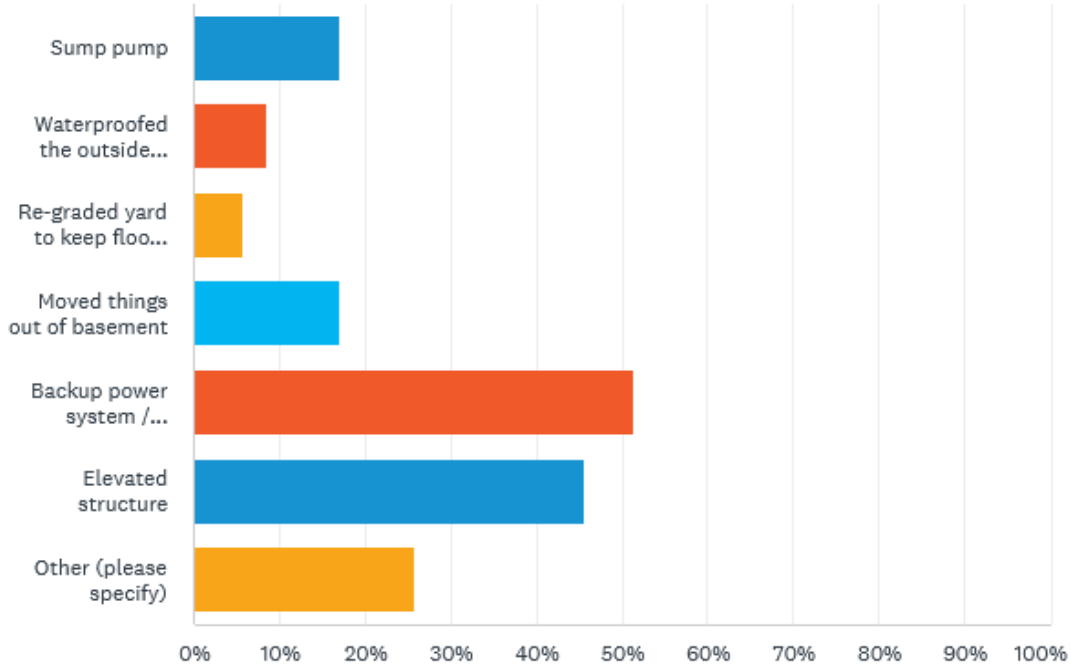


What do you think causes the flooding in your area?



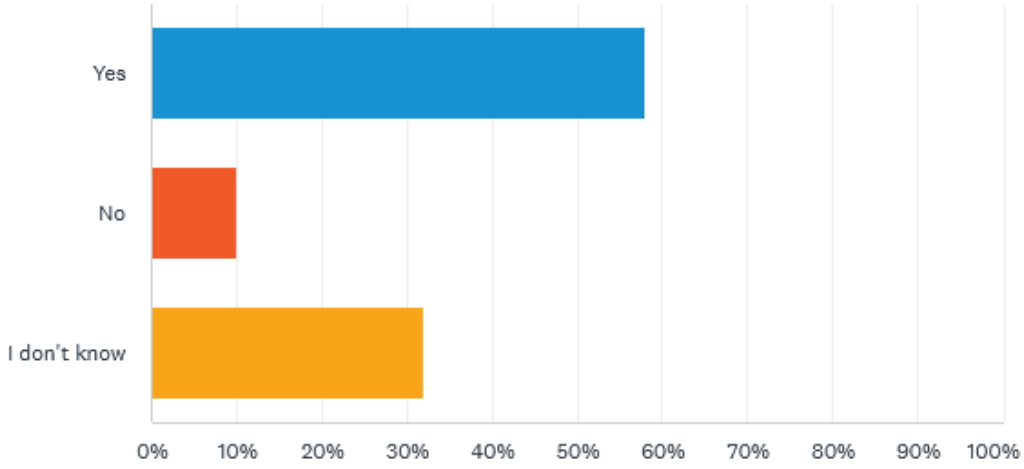
Other responses include: increased sediment in riverbed, too much water released from upstream dams, rain on snow, over-development, deforestation, downstream bridge capacity, insufficient drainage, valves not operating, clogged trash racks, excessive building, clear cutting, and paving in the area, and warming winters.

What flood protection measures have you installed on your property?

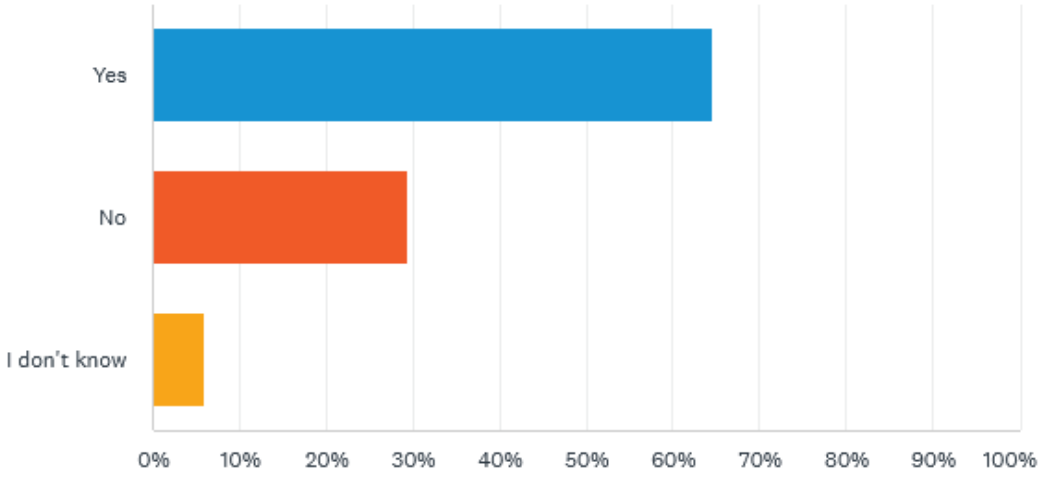


Other responses include: protecting interior of accessory structures (barn, garage), elevating appliances in the basement, and purchasing a backup sump pump.

Is the home/building located in the 1% chance floodplain (also known as the FEMA 100-year floodplain)?



Do you have FEMA flood insurance?



STEP 2. CONTACT AGENCIES AND ORGANIZATIONS

King County contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss areas. The County used the data to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. Those agencies, reports, and associated data which were analyzed and reviewed included:

- King County Code
  - Zoning Ordinance
  - Subdivision Regulations
  - Floodplain Management Ordinance
  - Critical Areas Ordinance
  - Stormwater Management Ordinance
- American Rivers
- Army Corps of Engineers Seattle District
- King County Strategic Climate Action Plan (SCAP), 2020
- King County Comprehensive Plan, 2022
- King County Hazard Mitigation Plan, 2020
- Washington Department of Ecology, NFIP Coordinator
- King County, Washington and Incorporated Areas Flood Insurance Study (FIS), August 19, 2020
- Federal Emergency Management Agency
  - Repetitive Loss Data: 4-21-2022
  - Flood Insurance Policy Data: 7-8-2022
  - Claims Data: 7-8-2022
- King County Strategic Climate Action Plan (SCAP)
- King County Flood Control District Plans and Investment Strategies
- Flood Studies/Reports/etc.

Summary of Studies and Reports

FEMA Flood Insurance Study
The most recent FIS for King County, WA is dated August 19, 2020. The FIS revises and updates information on the location and severity of flood hazards within King County. The FIS also includes revised digital Flood Insurance Rate Maps (FIRMs) which reflect updated Special Flood Hazard Areas (SFHAs) and flood zones for the County.

Flood Insurance Claims Data
FEMA provided a history of flood insurance claims and current flood insurance policies for King County. The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore, all claims data in this report are only discussed in general terms.

Flood Control District Plans and Investment Strategies
The King County Flood Control District prepares plans and strategies for management of the river basins. These plans and strategies outline the near-term, medium-term, and long-term projects and actions that were identified during an assessment of key problem areas and potential solutions.

A capital investment strategy proposes a sequence of coordinated projects to address the most critical flood and erosion risks and to restore habitat along a specified stretch of river or within a river basin. Capital investment strategies are directed by the Flood Control District, completed by King County, and eventually approved as policy guidance by the District's Executive Committee.

This analysis included a review of the 2022-2027 Six-Year Capital Improvement Plan, Cedar River Capital Investment Strategy, Middle and South Fork Snoqualmie Capital Investment Strategies, and other planning documents.

King County Comprehensive Plan, Updated 2020
The King County Comprehensive Plan is intended to guide growth and development decisions over the next 20 years. The Comprehensive Plan includes a set of goals and policies which are intended to inform decisions related to growth and land uses.

King County Hazard Mitigation Plan, 2020
The primary reason for developing a Hazard Mitigation Plan (HMP) is to reduce a community's exposure to natural hazards by taking proactive, pre-disaster planning steps to limit development in hazard sensitive areas, particularly floodplain or flood hazard areas. The second reason is to comply with the hazard mitigation planning requirements established by the Federal Emergency Management Agency (FEMA).

- **DNRP-WLR-1 – Flood Insurance Program.** Continue to maintain compliance and good standing under the National Flood Insurance Program. This will be accomplished through the implementation of floodplain management programs, at a minimum, will meet the minimum requirements of the NFIP, which include the following:
    - Enforcing the adopted flood damage prevention ordinance.
    - Participating in floodplain identification and mapping updates.
    - Providing public assistance and information on floodplain requirements and impacts.
- **DNRP-WLR-5 – Flood Protection Facility Maintenance**. Maintain and repair damaged structural elements for King County's extensive inventory of flood protection facilities.
- **DNRP-WLR-7 – Flood Hazard Mitigation.** Acquire repetitively damaged homes, purchase underdeveloped land to prevent future development in flood prone areas, and, where cost-effective and feasible, elevate residential homes that sustain recurring deep, low-velocity flooding.
- **DNRP-WLR-9 – Flood Hazard Reduction Programs.** Conduct activities that are vital to the mitigation of the natural hazards impacting King County, such as hazard identification, warning, information dissemination, and public outreach.

King County Flood Hazard Management Plan, 2006/2013 Update
The County is currently in the process of updating their Flood Hazard Management Plan. The purpose of the FMP is to identify, assess, and mitigate flood hazards and flood risk in the County. This plan documents the County's flood hazard mitigation planning process and identifies relevant flood hazards

and vulnerabilities as well as strategies the County will use to decrease vulnerability and increase resiliency and sustainability. The Plan examines flood occurrences and flood risk in the 100- and 500-year floodplain; localized flooding areas identified by the County, including those areas located in the Zone X flood zone; stream bank erosion, coastal erosion, and erosion hazards caused by flooding; flooding associated with sea level rise and climate change; and dam failure inundation.

King County Strategic Climate Action Plan

King County's Strategic Climate Action Plan (SCAP) is a five-year blueprint for County climate action, integrating climate change into all areas of County operations and work with King County cities, partners, communities, and residents. Strategic multi-benefit Floodplain Management initiatives include: Evaluate climate impacts on flood mitigation infrastructure and activities (PREP 2.2.1); Develop a climate change capital planning strategy for flood mitigation projects (PREP 1.2.1); Incorporate climate impacts on flooding into outreach for floodplain property owners; Help farmland owners elevate homes and increase access to high ground (PREP 4.2.13); Support farmer participation in disaster insurance programs (PREP 5.1.6); Include climate change in the prioritization of fish passage barriers (PREP 1.2.5) and the design, operation, and maintenance of assets in streams (PREP 1.2.6); Assess levee setbacks on summer low-flow conditions for salmon recovery (PREP 2.2.6); Evaluate projected changes in summer streamflow (PREP 2.2.7); Evaluate the role of upper watershed forests in reducing climate impacts on salmon (PREP 4.2.4); Explore changes in regulated streamflow management (PREP 4.2.3), Increase sea level rise outreach and engagement on Vashon-Maury Island (PREP 5.1.2); Optimize the performance of existing stormwater assets (PREP 2.2.5); Develop a methodology and standard for assessing climate resiliency for stormwater management (PREP 1.2.4); Develop a stormwater and climate change communications strategy (PREP 5.1.3).

STEP 3. BUILDING DATA COLLECTION

Basin teams conducted on-site field survey for this analysis between June 15-24, 2022. Basin teams performed the surveys and used a mobile application to collect data and photos (Exhibit 9). Appendix C includes screenshots of the complete survey

In addition, the basin teams took multiple site photos of each structure on the property. They also took photos current drainage features and mitigation and floodproofing measures if evident from street or parking lot views.

The basin teams recorded the following information for each property:

- Primary land use
- Presence of basement
- First floor elevation compared to other structures in repetitive loss area
- Foundation type
- Foundation condition
- Structure condition
- Type of effective mitigation measures
- Notes about drainage patterns around the building, observations, or comments
- Photos

The consultant team gathered additional information from assessor's data, such as year of construction or remodel, building characteristics, and confirmation of whether or not there is a basement.

Basin teams also gathered data, when possible, through conversations with property owners and/or residents. These conversations provided detail on the extent of flooding, potential causes of flooding, and recollections from past flood events, which help to better understand flooding issues for these areas.

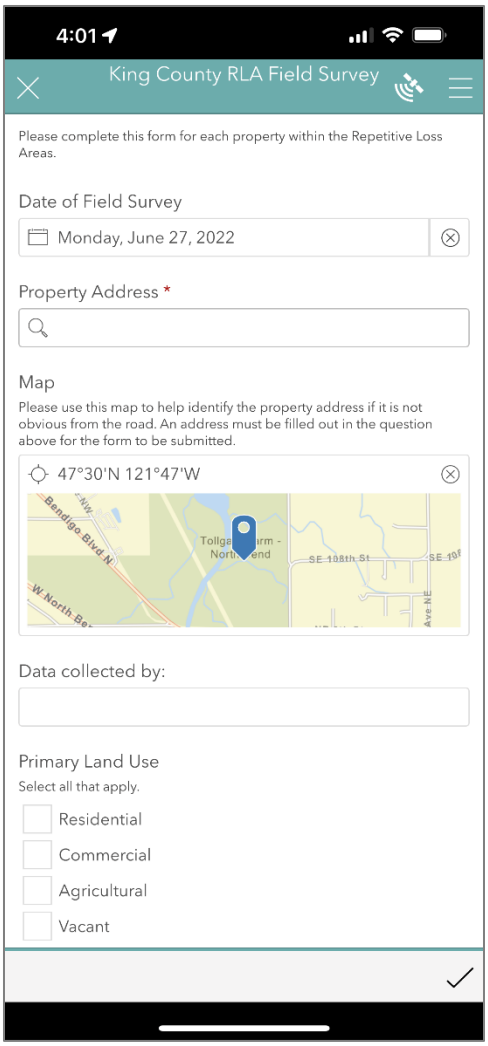


Exhibit 9. Mobile Field Survey.

STEP 4. REVIEW ALTERNATIVE MITIGATION APPROACHES

Mitigation is essential to reducing flood risk and repetitive flood losses. There are many ways to protect property, from improvements that can be implemented by individual property owners to capital projects that affect large areas.

The King County Flood Control District invests in several types of flood mitigation projects throughout King County. Since 2008, the District has elevated 66 homes and acquired 215 flood-prone and at-risk properties totaling 600 acres. The County's investment in the home buyout and elevation program has cost $66 million. The District also performs studies and manages and funds capital projects such as revetment repairs, levee maintenance and setbacks, dredging, and other flood risk reduction projects. These projects have had a beneficial effect on reducing flood risk and flood damage throughout the County.

King County has studied, evaluated, and invested in each basin. Individual basin investments and studies are described in the basin descriptions in Step 5.

Types of Mitigation

The CRS Coordinator's Manual (2017) breaks down flood mitigation into six types:

- Preventive activities
- Property protection activities
- Natural resource protection activities
- Emergency services
- Structural projects
- Public information activities

Preventative Activities

Preventative activities keep flood problems from getting worse. King County regulates development through its building code, zoning requirements, critical areas ordinance, stormwater management regulations, and floodplain management ordinance. In King County, floodplain regulations are enforced by the Department of Local Services, Permitting Division.

The success of preventative actions often depends on the quality of data that identifies the problem, such as flood mapping that identifies the boundaries of the regulatory floodplain. Over 30 percent of claims paid to repetitive loss properties are for properties outside of the 100-year floodplain. The King County Hazard Mitigation Plan identifies the following actions for updating flood maps:

1. Update Flood Insurance Rate Maps to utilize better flood risk data, including the South Fork Skykomish River and streams with Zone A maps. Also identify a strategy and timeline for updating other streams/rivers that need updated flood risk data.
2. Create climate-influenced flood risk maps that can be used for planning purposes.

3. Create sea level rise flood risk maps for various sea level rise scenarios to be used for planning and regulatory purposes.
4. Continue updating channel migration zone maps.
5. Release dam failure maps where appropriate and provide technical assistance to high hazard dam owners to complete updated inundation maps.
6. Complete levee failure maps and release them to the public where appropriate.

Property Protection Activities

Property protection activities are usually undertaken by property owners on a building-by-building or parcel basis. FEMA has published numerous manuals to help property owners determine appropriate property protection measures:

- FEMA 259, Engineering Principles and Practices of Retrofitting Floodprone Residential Structures
- FEMA 312, Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding
- FEMA 551, Selecting Appropriate Mitigation Measures for Floodprone Structures
- FEMA 348, Protecting Building Utilities from Flood Damage
- FEMA 511, Reducing Damage from Localized Flooding
- FEMA 102, Floodproofing Non-Residential Structures
- FEMA 84, Answers to Questions about the NFIP
- FEMA 54, Elevated Residential Structures Book
- FEMA 268, Protecting Floodplain Resources: A Guidebook for Communities
- FEMA 347, Above the Flood: Elevating Your Floodprone House
- FEMA 85, Protecting Manufactured Homes from Floods and Other Hazards

The primary methods of property protection considered for repetitive loss areas include:

Land Acquisition and Structure Demolition
One of the most effective approaches to preventing further flood damage to a building is acquisition of the land and demolition of the structure. The property would then serve as open space or recreation area in perpetuity. Property owners retain the right to select this as a mitigation method and acquisitions are voluntary when possible. They may sell their property to King County or an agency dedicated to the preservation and management of local open space. Acquisition is a relatively expensive mitigation measure, but it provides the greatest benefit in that lives and property are protected from flood damage.

King County's program for land acquisition has been very successful, with the purchase of 215 flood-prone properties since 2008 and several more in progress. The King County Hazard Mitigation Plan identifies the following actions for home acquisitions:

1. Continue proactively purchasing flood prone properties for the purpose of flood risk reduction.
2. Accelerate coastal floodplain acquisitions.
3. Create and maintain a prioritized acquisition list so that properties can be purchased whenever the opportunity arises.

4. Consider other tools to purchase land over time or future development rights, such as a program where a property owner receives an upfront payment with an agreement that the County will fully purchase the property if it's flooded or the owner seeks to sell.
5. Purchase and remove infrastructure as part of neighborhood-level acquisitions.

Home Elevation
When the floor of a home is below the 100-year flood elevation, physically elevating the structure is often recommended as it is one of the most effective means to prevent flood damage. Financial assistance may be available for elevation. Since 2008, King County Flood Control District has provided financial assistance to 66 homeowners to elevate their homes. The County also requires all substantially damaged or improved residential buildings to come into compliance with current regulations, which often includes home elevation. A substantial improvement is any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the "start of construction" of the improvement.

Relocation
Sometimes property owners can relocate the building to another property or a location on the property outside of the 100-year floodplain.

Floodproofing
Floodproofing consists of completely sealing around the exterior of the building so that water cannot enter the building. Dry floodproofing is not a good option for areas where floodwater is deep or flows quickly. The hydrostatic pressure and/or hydrodynamic force can structurally damage the building by causing the walls to collapse or causing the entire structure to float. However, in areas that have minimal velocity and low depth, dry floodproofing can be a good option.

The NFIP allows floodproofing for non-residential structures and for residential retrofits that are not classified as a substantial improvement. Homeowners can implement floodproofing methods on their property to provide some protection. For example, properties that do not have adequate protection of their low opening (window or basement door) can effectively raise the low opening height with a window well or a flood gate. The ultimate height of the low opening depends on several factors, such as: the level of flood protection desired, the appearance, and cost. The flood protection elevation could be set one-foot higher than the existing low opening elevation, or it could be set to match the elevation of the lowest opening into a home that cannot be raised. This might be the elevation of the threshold of a door, for example.

Wet Floodproofing
Wet floodproofing consists of modifying uninhabited portions of a home, such as a crawl space, garage, or unfinished basement with flood-damage resistant materials, to allow floodwaters to enter the structure without causing damage. Wet floodproofing requires portions of the building to be cleared of valuable items and mechanical utilities. A key component of wet floodproofing is providing openings large enough for the water to flow through the structure such that the elevation of the water in the structure is equal to the elevation of the water outside of the structure. This equilibrium of floodwater prevents hydrostatic pressure from damaging structural walls.

Elevate Damage-Prone Components
Critical items, such as furnace or air conditioning units, should be elevated to avoid flood damage. These items may be located outside of the structure or within the structure in areas that are wet-floodproofed, such as a crawl space.

Drainage Maintenance
In some cases, there are activities that the property owner can do on-site such as directing shallow floodwater away from a flood-prone structure. Shallow flooding can often be kept away from a structure if some simple improvements are made to the yard. Sometimes structures are built at the bottom of a hill or in a natural drainage way or storage area, so that water naturally flows toward them.

Temporary Barriers
Several types of temporary barriers are available to address typical flooding problems. They work to direct drainage away from structures with the same principles as permanent barriers such as floodwalls or levees, but can be removed, stored, and reused in subsequent flood events.

Natural Resource Protection Activities

Natural resource protection activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations. In addition to the at-risk properties purchased by the King County Flood Control District, many other repetitive loss area properties have been purchased by the County or other agencies, such as Seattle Public Utilities, to provide or restore floodplain habitat and improve floodplain function. Many of these projects are considered either acquisition or capital projects with multiple benefits.

Emergency Services

Emergency services are measures taken before and during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities. These measures include flood warning notifications and response activities.

Structural Projects

Structural projects keep floodwaters away from an area with a levee, reservoir, or other flood control measure. King County Flood Control District generally leads structural projects within the floodplain. These projects are planned for and identified within each basin's Capital Investment Strategy and other planning documents. They include levee repairs and setbacks, elevating roads, and other capital projects.

Public Information Activities

Public information activities advise property owners, potential property owners, and visitors about hazards and ways to protect people and property from them, as well as the natural and beneficial functions of local floodplains. This activity also includes educating property owners about flood insurance. Every year King County send a floodplain newsletter to all properties within the floodplain, as

well as a separate outreach letter to all properties within the repetitive loss areas. The King County Hazard Mitigation Plan identifies the following public information activities that should be conducted on an annual basis:

1. Flood brochure – sent to every property owner in the floodplain.
2. Repetitive loss letter – sent to properties with known repeated losses.
3. Realtor, insurance agent, and other stakeholder outreach – workshops, meetings, or other outreach to professionals who need flood risk information.
4. News media outreach – coordinated effort to share stories about flood risk with the news media.
5. Annual event – separate or coordinated event every year that focuses on flood risk.

Funding

There are several sources of funding to support implementation of mitigation activities. Many mitigation measures can be implemented by the property owner without requiring financial support. However, the more effective mitigation actions, such as home elevations, often require financial support for the homeowner to implement. King County is able to assist homeowners in identifying funding sources, as well as offering their own grant programs and funding sources. These funding sources available to property owners include:

- Local funding from King County Flood Control District for home elevations and acquisitions.
- FEMA Hazard Mitigation Assistance program, which includes the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) program, Severe Repetitive Loss (SRL) program, and Building Resilient Infrastructure and Capacity (BRIC) program. These grants require support from King County to apply.
- Increased Cost of Compliance (ICC) coverage which is part of the flood insurance program. The program provides funding to offset the costs of bringing a substantially damaged home into compliance with floodplain regulations.
- Small Business Administration (SBA) loans for disaster recovery provides low-interest loan to help property owners repair structures after a flood.

Capital projects implemented by King County are also eligible for financial support. Grant programs, such as Floodplains by Design and the Flood Control Assistance Account Program, as well as the FEMA grant programs listed above, provide funding to implement large structural projects that reduce flood risk. The Army Corps of Engineers provides financial support for some levee design and construction projects.

Mitigation Plan

While inspecting properties in the repetitive loss areas, field crews also evaluated possible mitigation measures for each property. These mitigation measures are listed in the findings in Step 5. The possible mitigation measures evaluated by the field crews were focused on actions that could be taken for individual properties, such as acquisition, elevation, drainage improvements, and building modifications such as adding additional vents or elevating HVAC systems.

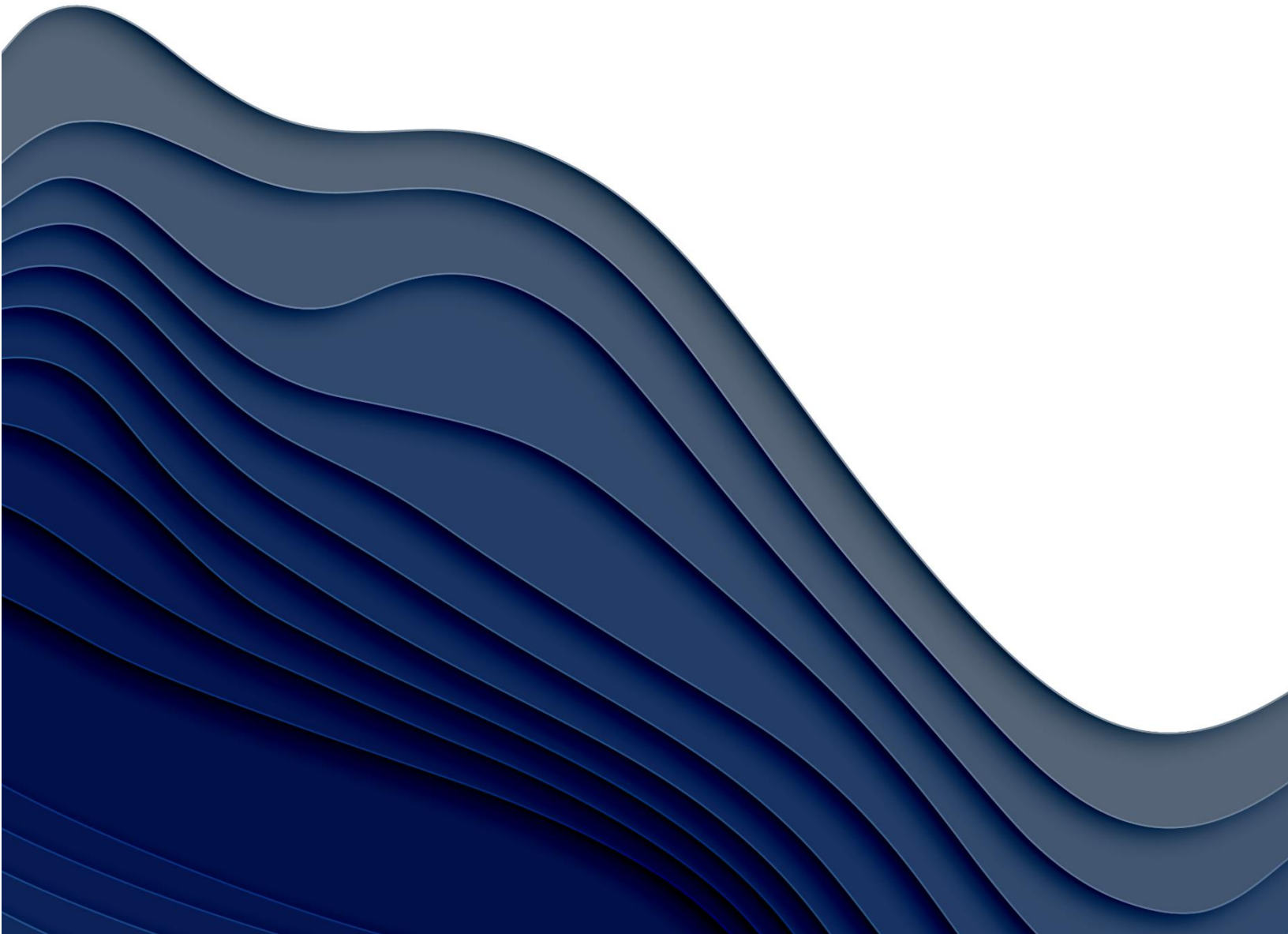
The mitigation review also included a review of current Capital Investment Strategies and other planning documents for each basin. Information about the capital projects proposed in repetitive loss areas is provided in the findings in Step 5.

STEP 5. DOCUMENT THE FINDINGS

Part 3 of this analysis documents the findings of inspections and research into repetitive loss properties and repetitive loss areas. The repetitive loss areas are grouped into basins. Each basin section includes a description and map of the basin and proposed capital projects. Each repetitive loss area section includes a description of the flooding problem, identification of proposed and possible mitigation, resident comments, map, photo of past flood events, photos of example properties, and a description of the properties within the repetitive loss area.

In accordance with the Privacy Act of 1974, addresses, claims, insurance data, repetitive loss classification, and other protected information will not be shared with the general public.

PART 3
Repetitive Loss Property Analysis



BASIN 1 – CEDAR RIVER

The Cedar River Basin has 5 repetitive loss areas, 6 unmitigated properties, 14 mitigated properties, and 65 total properties.

The Cedar River is one of five major rivers in King County and is the largest tributary to Lake Washington (Exhibit 10). The basin has distinctly different upper and lower areas. The 122-square mile upper basin lies within Seattle's Cedar River Watershed. The upper basin is unpopulated, forested, mountainous land, exclusively owned by the City of Seattle and protected from land development. The 66-square-mile lower basin includes a broad array of natural resources and a spectrum of land uses ranging from the Renton urban center near the mouth of the river, to suburban areas, to the rural and forest zones abutting the Seattle Watershed. It is within the lower basin where conflicts between the river and development arise, and where five repetitive loss areas are located. Flooding in the Cedar River Basin is generally stage flooding associated with atmospheric rivers that bring warm moist air and cause heavy rainfall and rapid mountain snow melt. For example, in January 2009, the west slopes of the Cascade Mountains received from 3-5 inches of warm rain in a 24-hour period, leading to major flooding state-wide and including the Cedar River.

Since 1992, after severe flooding occurred along the river, the County has supported a watershed planning process focused on reducing the life-threatening flood flows, improving and protecting fish habitat, and protecting water quality.

The Cedar River Capital Investment Strategy (CIS) was a corridor-wide planning effort that evaluated flood and erosion risks and identified a range of potential capital project solutions for the areas where risks are highest. To date, ten of the 22 projects in the CIS are underway or completed.

Current projects in the basin include:

Herzman to Camp Freeman Project
The Herzman to Camp Freeman Project will provide flood and erosion risk reduction along a stretch of the Cedar River about four miles east of the City of Renton. The need for the project was identified in the Cedar River Capital Investment Strategy, completed in 2017, which identified flood and erosion risks and potential solutions throughout the lower Cedar River valley. Major flooding in February 2020 changed the trajectory of the river in the reach, and the project was modified to address new risks at the downstream end of the project area.

Jan Road Levee Setback Project
This project undertakes improvements to Jan Road to minimize flood risk. The project includes raising Jan Road to improve access during flood events; setting back or removing potions of the Jan Road Levee in order to reduce potential damage to the downstream Cedar River Trail Levee, which protects portions of both the Cedar River Trail and the Maple Valley Highway; and acquiring at-risk homes. The project is designed to ensure that equivalent or better flood risk reduction remains for the houses remaining behind the levees.

Maplewood Landslide and Flood Risk Reduction Feasibility Study
This project analyzes flood and landslide hazards and potential associated risk in the Maplewood neighborhood. It includes an analysis of existing levees to see if levee-modifications could reduce flood

risks. If the landslide hazard assessment indicates the potential to increase flood risks, an additional feasibility study will be conducted to evaluate options to mitigate landslide hazards.

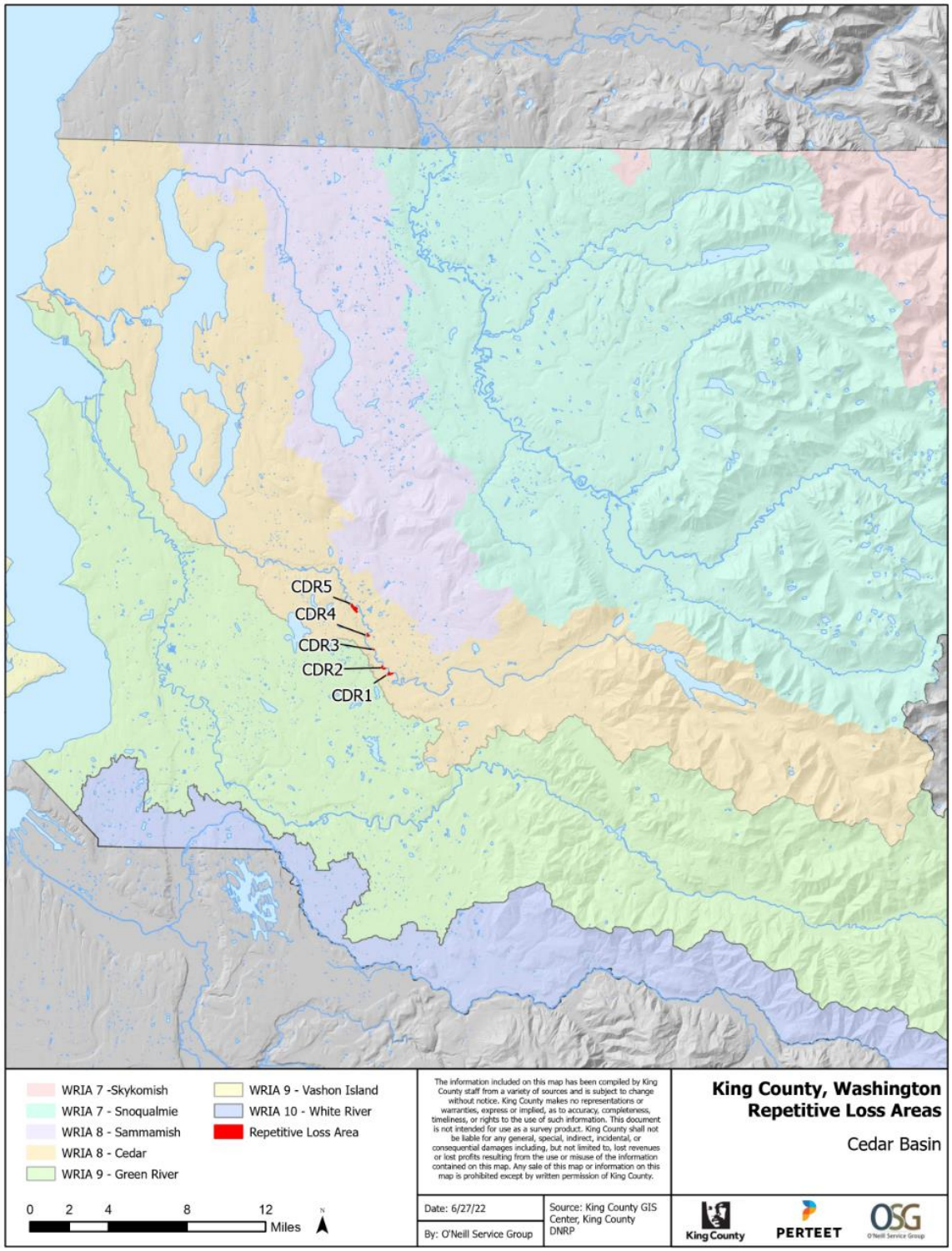


Exhibit 10. Cedar River Basin.

Repetitive Loss Area 1: Orchard Grove (CDR 1)

Orchard Grove is a residential neighborhood located on the right bank of the Cedar River and is partially located within the 100-year floodplain and floodway. The neighborhood was platted in the 1930s and many of the homes were constructed in the 1930s and 1940s. The area experiences overbank flooding due to a U-shaped bend in the river and lower ground elevations than the opposite bank. The high left bank forces the floodwaters into the lower elevation portion of the Orchard Grove neighborhood, flooding yards and houses. During flooding, the neighborhood is isolated from overtopped roads.

The Cedar RCIS identifies possible solutions, including: raise low-lying section of road; construct side channel to convey flows away from right bank residential area; and acquire up to 11 high risk homes from willing sellers. The estimated cost is $1.9 Million to $10.4 Million (2017).

Residents reported that there was damage to the riprap during the last flood, that erosion has continued to occur, and that poor management of the watershed contributes to flooding.

Exhibit 11. Repetitive Loss Area Summary (CDR 1).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Orchard Grove	3	2	2	21	12	26

Exhibit 12. Repetitive Loss Area Detailed Analysis (CDR 1).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			2005	Garage	Average
			2008	Crawl space	Average
			1932	Crawl space	Average
			1937	Slab on grade	Average
			1937	Slab on grade	Average
			1934	Crawl space	Average
			1933	Unknown	Average
			1937	Unknown	Average
			1962	Crawl space	Good
			1935	Crawl space	Good
			1941	Crawl space	Average
			1939	Crawl space	Average
			1933	Crawl space	Average
			1931	Crawl space	Average
			1986	Unknown	Average
			1936	Crawl space	Average
			2003	Slab on grade	Average
			1932	Crawl space	Average
			1957	Crawl space	Average
			1992	Crawl space	Good
			1939	Basement	Average
			1934	Basement	Average
			1966	Slab on grade	Good
			2017	Crawl space	Good

Exhibit 13. Repetitive Loss Area Field Survey Data (CDR 1).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A		X		X		
	A	X	X				
	A		X		X		
	A		X		X		
	A		X		X		
	H		X		X		
	A		X		X		
	L		X		X		
	H	X	X				
	H				X		
	L		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	H		X		X		
	A		X		X		

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

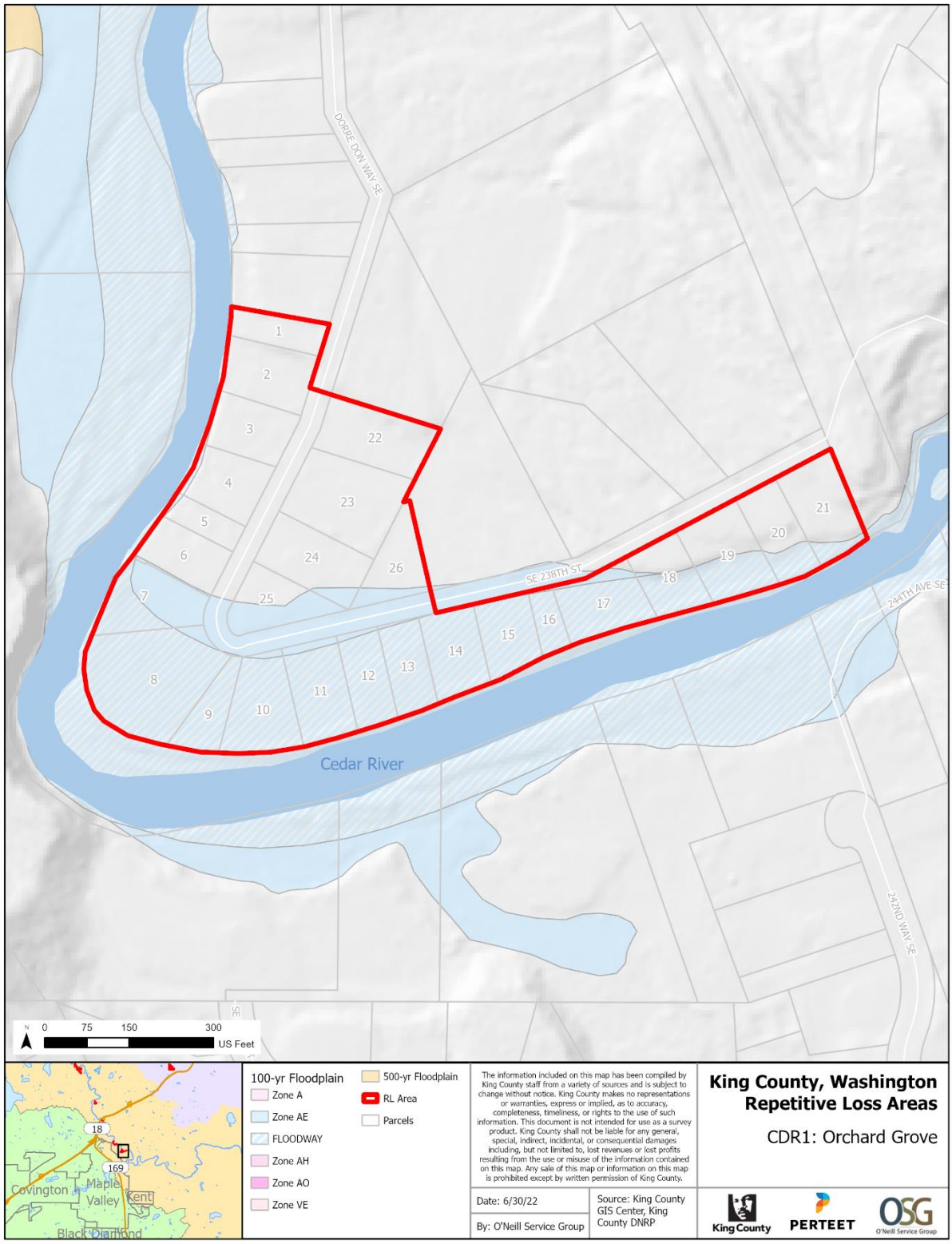


Exhibit 14. Orchard Grove (CDR 1).

Flood Photos

Cedar River at Orchard Grove. January 9, 2009.

Cedar River at Orchard Grove. January 9, 2009.

Example Properties

Repetitive Loss Area 2: Lower Dorre Don (CDR 2)

The Lower Dorre Don neighborhood is located just downstream of Orchard Grove, also on the right bank and on the inside of a U-shaped bend in the river. The neighborhood was platted in the 1920s as the "Dorre Don Campsites" and many homes were constructed in that decade. The neighborhood is protected by a levee that directs the river to pass under a railroad bridge (currently the Cedar River Trail). In 1990, the levee breached and flooded residents. Flooding is now associated with groundwater seepage and backwater from floodwaters that overtop a low spot in the levee, also flooding roads and isolating several homes. In February 2020, an avulsion of the mainstem channel just downstream from the trail bridge reduced risks to a number of homes in the reach, but the reach remains one of the most vulnerable along the Cedar River.

The Cedar River CIS identifies possible solutions including: conduct feasibility study to evaluate opportunities to modify right bank levee and revetment system and/or raise Lower Dorre Don Road SE to reduce the frequency and severity of flooding. The estimated cost is $350,000 (2017). This project is identified as a medium-term action (7-10 years from the 2017 adoption of the CIS).

Residents reported that elevating structures has reduced flood damage.

Exhibit 15. Repetitive Loss Area Summary (CDR 2).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Lower Dorre Don	1	0	0	19	12	20

Exhibit 16. Repetitive Loss Area Detailed Analysis (CDR 2).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1929	Crawl space	Average
			1930	Crawl space	Average
			1928	Crawl space	Average
			1927	Crawl space	Average
			1977	Crawl space	Average
			1929	Crawl space	Average
			1928	Crawl space	Average
			1996	Unknown	Average
			1970	Crawl space	Average
			1924	Unknown	Average
			1930	Crawl space	Average
			1930	Crawl space	Average
			1928	Unknown	Average
			2000	Crawl space	Good
			1963	Unknown	Average
			1972	Crawl space	Average
			1930	Crawl space	Average

Exhibit 17. Repetitive Loss Area Field Survey Data (CDR 2).

Address	First Floor Elevation[1]	Possible Mitigation Options					
		Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	H		X		X		
	A		X		X		
	A		X		X		
	H		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	A		X		X		
	H		X		X		
	Unknown		X		X		
	A		X		X		
	A		X		X		

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

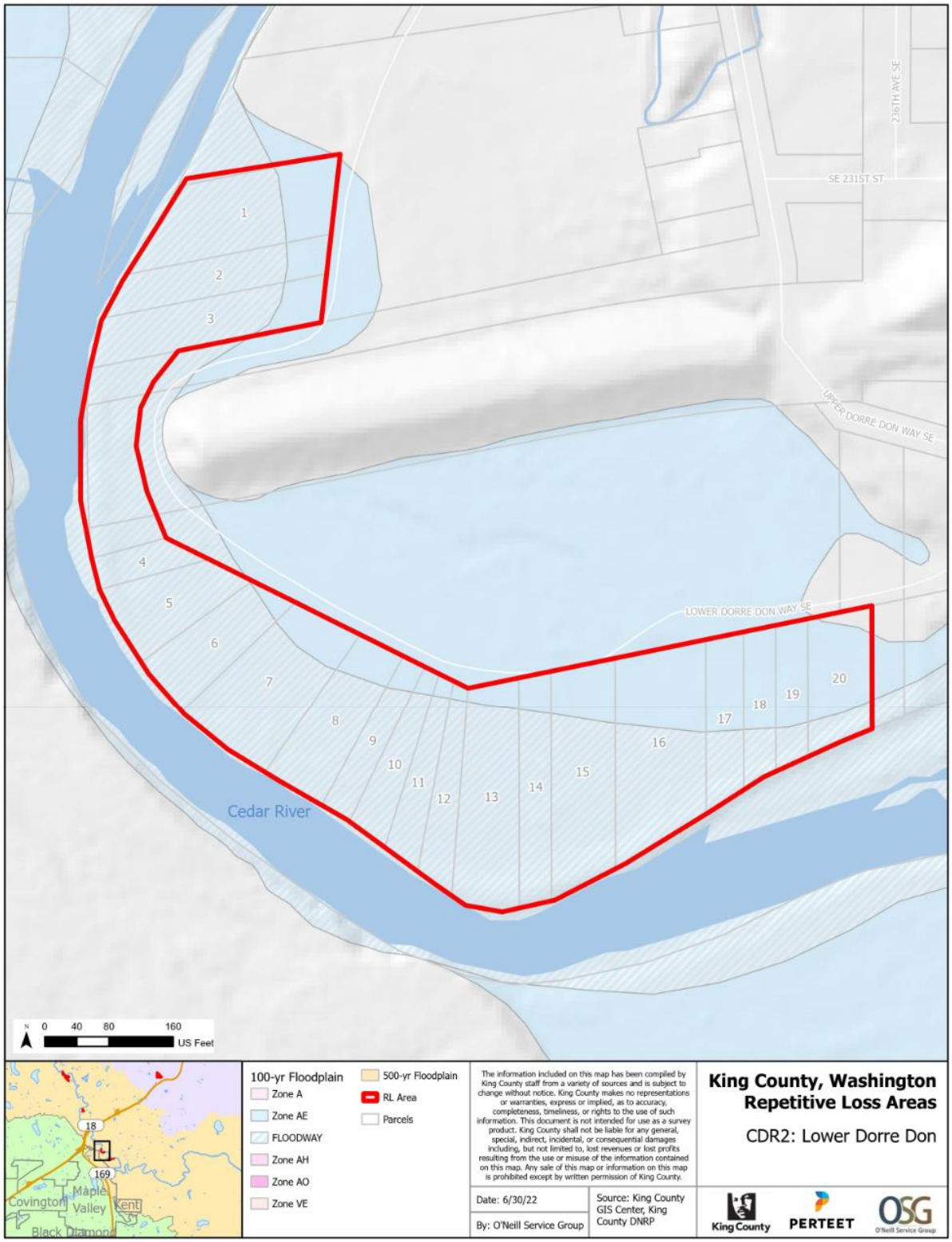


Exhibit 18. Lower Dorre Don (CDR 2).

Flood Photos

Cedar River at Lower Dorre Don. November 24, 1990.

Cedar River at Lower Dorre Don. November 24, 1990.

Example Properties




Repetitive Loss Area 3: SE 218th Street (CDR 3)

SE 218th Street is located between State Route 18 and State Route 169 (Renton-Maple Valley Road). There are four parcels within the channel migration zone of the Cedar River. Three of the parcels lie lower than the opposite bank and are inundated during flood events. Homes on two of these parcels are in both the floodplain and the severe channel migration zone. A third parcel was mitigated through a home buyout in 2015.

Exhibit 19. Repetitive Loss Area Summary (CDR 3).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
SE 218th Street	1	1	1	2	3	4

Exhibit 20. Repetitive Loss Area Detailed Analysis (CDR 3).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1930	Crawl space	Average
				Vacant	Vacant
			1946	Slab on grade	Average
			1911	Slab on grade	Average

Exhibit 21. Repetitive Loss Area Field Survey Data (CDR 3).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	H	X		X			
	L		X		X		
	A		X		X		

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

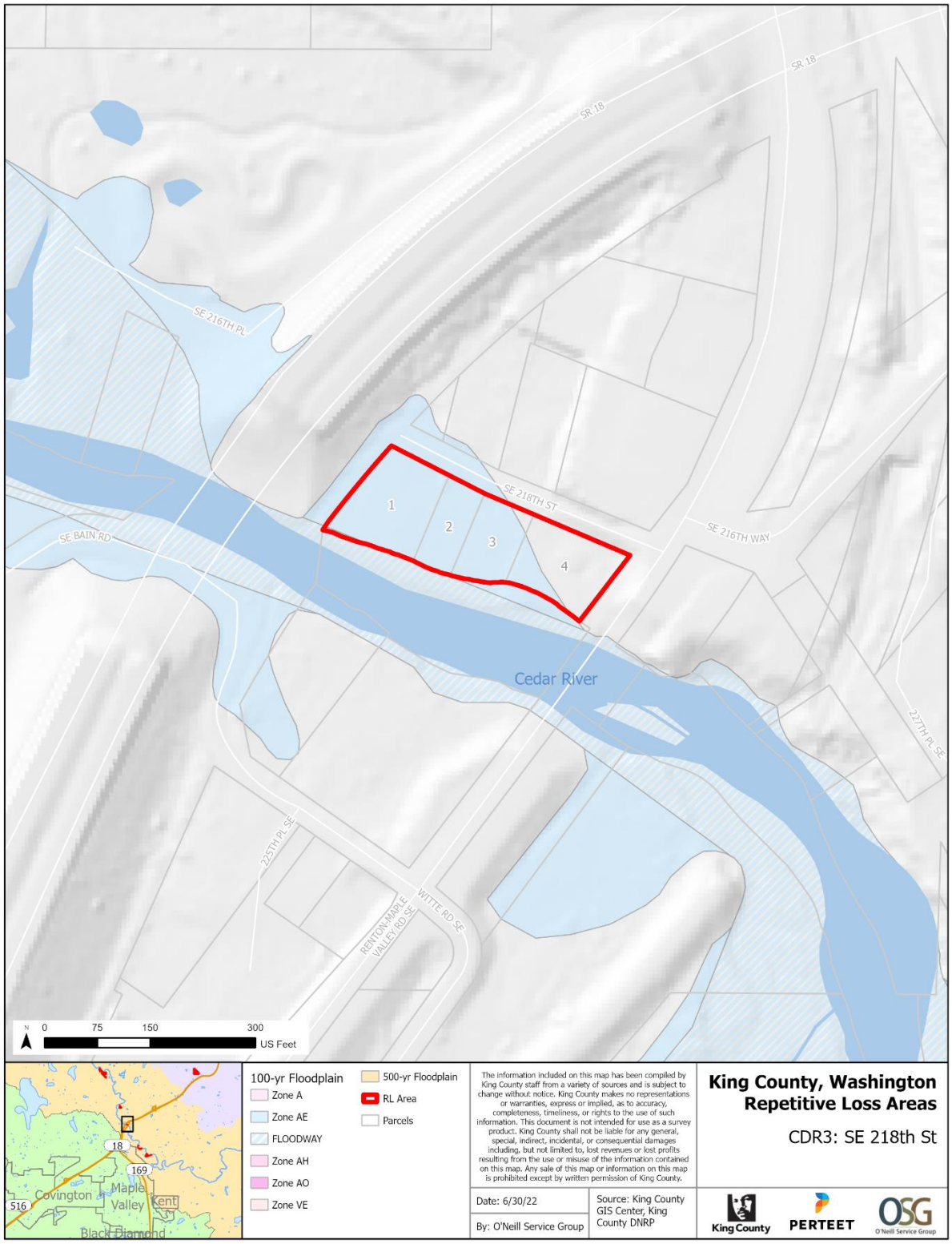


Exhibit 22. SE 218th Street (CDR 3).

Flood Photos

Cedar River at SE 218th Street. January 7, 2009.

Example Properties

Repetitive Loss Area 4: Royal Arch (CDR 4)

The Royal Arch area is located downstream of SR 18. In this vicinity, the river grade begins to flatten, and the floodplain and floodway become more expansive. The properties in this RLA are just upstream of a bridge crossing that restricts the river. The area has been the focus of past mitigation conducted in partnership with the City of Seattle Public Utilities, which purchased numerous parcels along the riverfront with structures that were damaged during the flooding in 2009. None of the properties acquired to date are repetitive loss properties.

Residents reported that better management of the watershed may reduce flooding.

Exhibit 23. Repetitive Loss Area Summary (CDR 4).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Royal Arch	1	0	1	3	2	4

Exhibit 24. Repetitive Loss Area Detailed Analysis (CDR 4).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1959	Basement	Average
			1958	Slab on grade	Average
				Vacant	Vacant
			1984	Slab on grade	Average

Exhibit 25. Repetitive Loss Area Field Survey Data (CDR 4).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	Unknown		X				
	A	X	X				
	A	X	X				

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

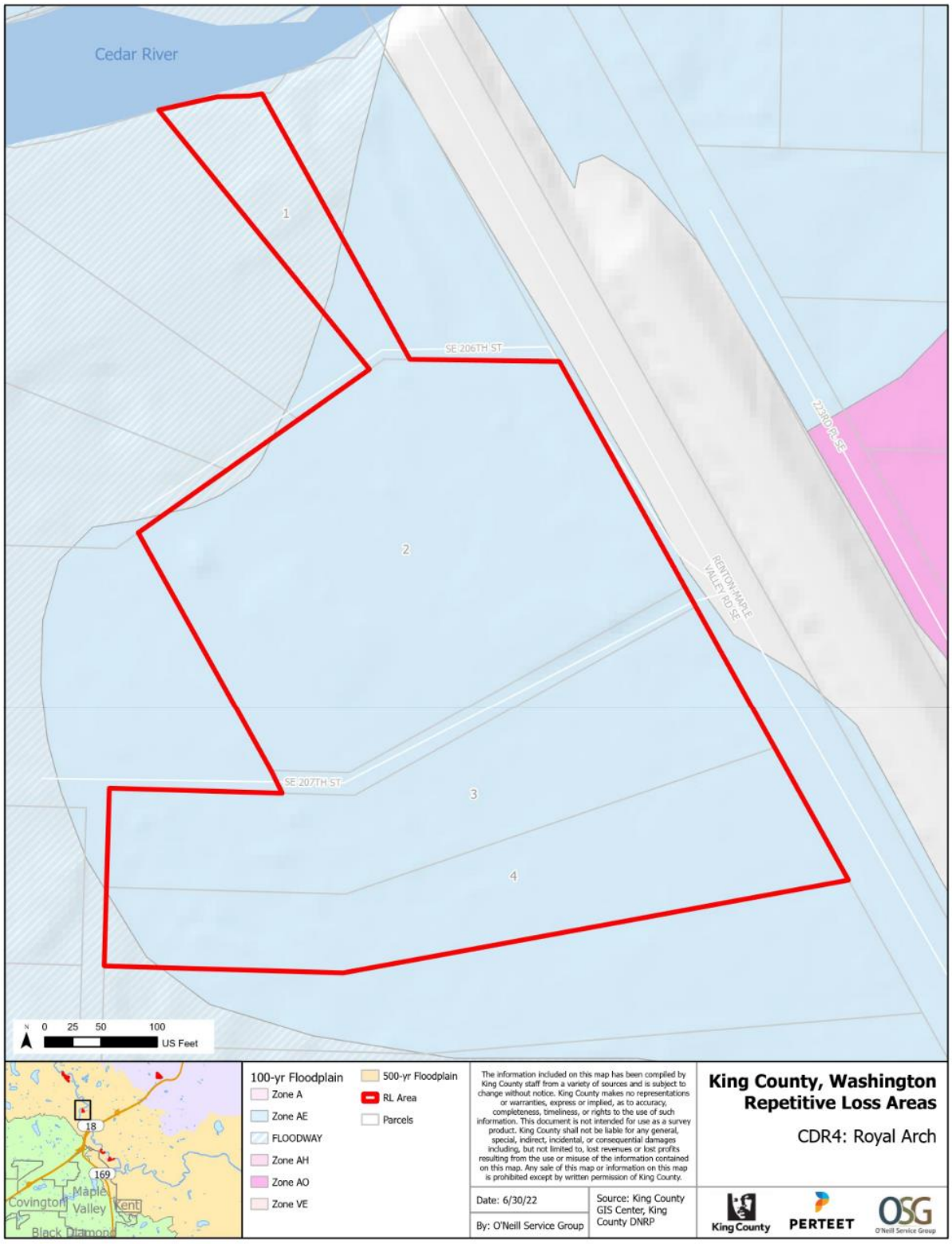


Exhibit 26. Royal Arch (CDR 4).

Flood Photos

Cedar River at Royal Arch. January 7, 2009.

Example Properties

Repetitive Loss Area 5: Byers (CDR 5)

The Byers Road neighborhood is located on the left bank of the river. The neighborhood is extensively inundated during as little as a 20-year flood and the sole access road is frequently inundated and unsafe for passage. Residents regularly require emergency evacuation.

The Cedar River CIS identifies the neighborhood along Byers Road as one of the most significant flood and erosion risk areas on the Cedar River. The CIS recommends conducting a feasibility study to evaluate the risks and possible solutions in greater detail. Opportunities likely to be considered include construction of an emergency egress route, acquisition of up to seven homes in the path of fast and deep flows, and structural improvements to more safely convey flows through the reach.

This project is identified as a medium-term action (7-10 years from the 2017 adoption of the CIS).

Exhibit 27. Repetitive Loss Area Summary (CDR 5).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Byers	2	1	5	8	3	11

Exhibit 28. Repetitive Loss Area Detailed Analysis (CDR 5).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.				Vacant	Vacant
			1968	Crawl space	Poor
			1954	Crawl space	Average
			1957	Basement	Good
			1994	Crawl space	Average
			1927	Unknown	Average

Exhibit 29. Repetitive Loss Area Field Survey Data (CDR 5).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	Unknown		X				
	A		X				
	A		X		X		
	A		X		X		
	A		X		X		

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

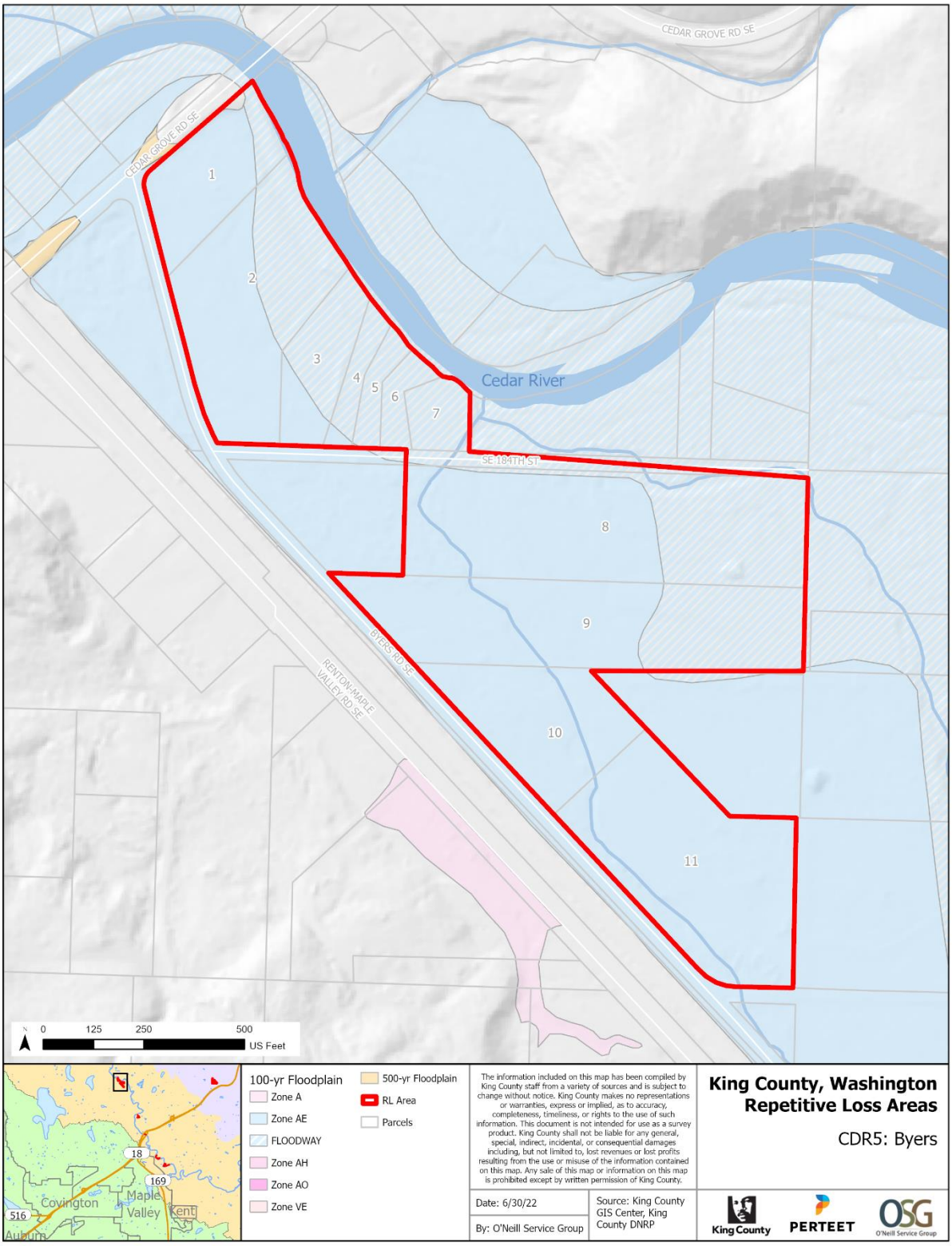


Exhibit 30. Byers (CDR 5).

Flood Photos

Cedar River at Byers Road. January 7, 2009.

Example Properties

BASIN 2 – SAMMAMISH RIVER BASIN

Within the Sammamish River Basin, there are three repetitive loss areas, three unmitigated repetitive loss properties, and one mitigated property. All repetitive loss properties in this basin are individual repetitive loss areas.

The Sammamish River flows 14 miles from Lake Sammamish to its mouth in Lake Washington. Major tributaries include Bear, Little Bear, North, and Swamp Creeks. The entire river is part of a flood control project completed by the US Army Corps of Engineers in 1965 that channelized, dredged, and straightened the previously meandering channel network. King County is the local sponsor and is responsible for long-term maintenance.

The Sammamish River Basin also includes a network of creeks that feed into Lake Sammamish, including Issaquah Creek. Two of the three repetitive loss properties are in the upper part of the watershed, above Lake Sammamish, and are associated with these creeks. The third property is downstream of Lake Sammamish.

None of the repetitive loss properties are within the floodplain, and all properties have unique and individual flood issues that are not shared by neighboring properties. In accordance with the Privacy Act of 1974, the individual properties will not be shared with the general public.

Current projects in the Sammamish River Basin include:

Sammamish River Capital Investment Strategy
This project develops a capital investment strategy for the entire length of the Sammamish River from Lake Sammamish to Lake Washington.

Willowmoor Floodplain Restoration Project
This project reconfigures the outlet from Lake Sammamish to the Sammamish River to maintain or reduce current level of flood risk in the downstream river channel and along the lake shore. The project will be designed in a manner that reduces flooding impacts and improves conditions for fish listed in the Endangered Species Act and other wildlife in the transition zone between the lake and the river.

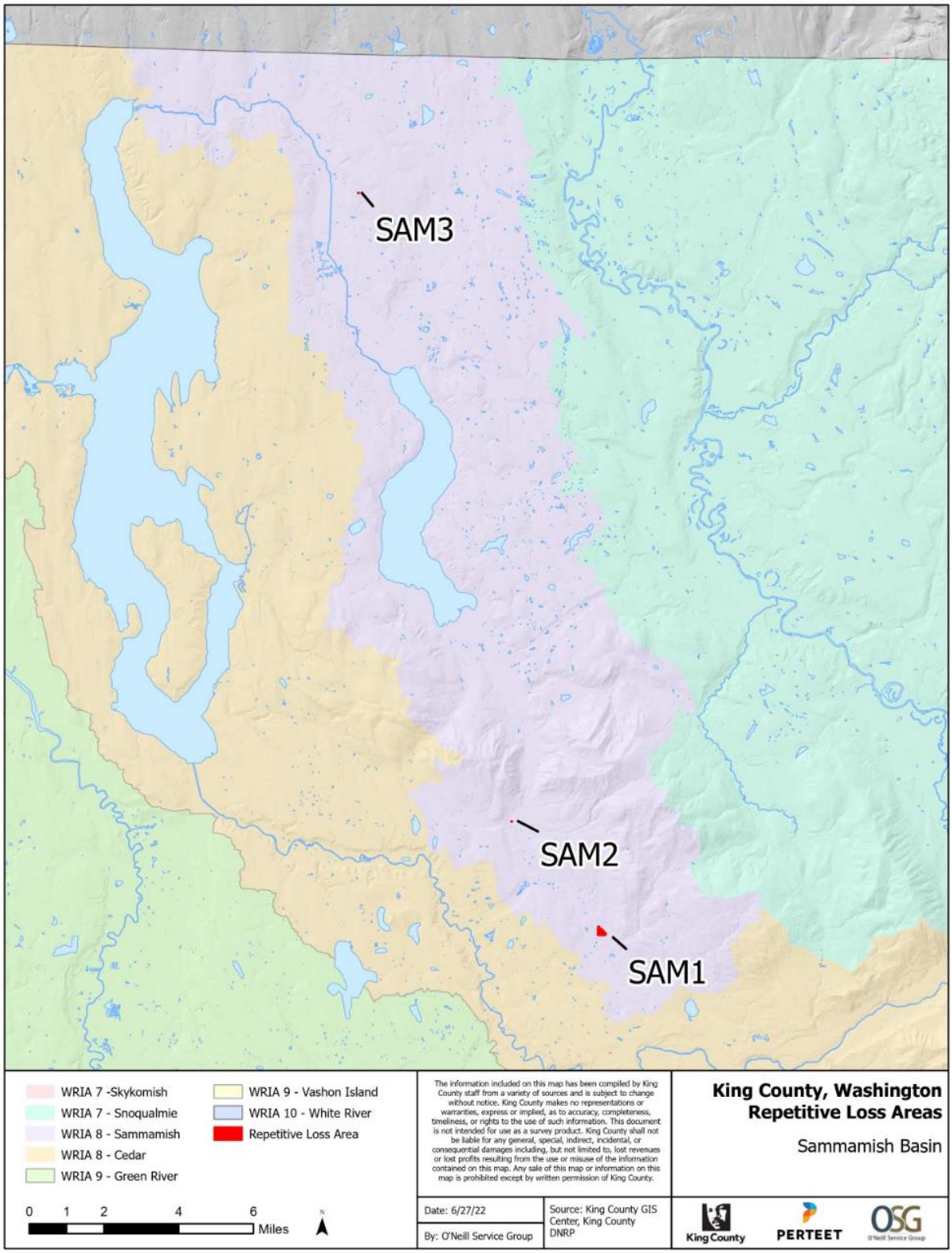


Exhibit 31. Sammamish Basin.

Repetitive Loss Area 1: Issaquah-Hobart Road (SAM 1)

In accordance with the Privacy Act of 1974, information about individual repetitive loss properties will not be shared with the general public.

This property is located along Holder Creek and is outside of the 100-year floodplain. The house has experienced basement flooding several times.

Residents reported that the basement flooded last in February 2020, when the creek overtopped the shallow bank behind the house

Exhibit 32. Repetitive Loss Area Summary (SAM 1).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Issaquah-Hobart Road	1	0	0	0	1	1

Exhibit 33. Repetitive Loss Area Detailed Analysis (SAM 1).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1960	Basement	Average

Exhibit 34. Repetitive Loss Area Field Survey Data (SAM 1).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A		X		X		

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

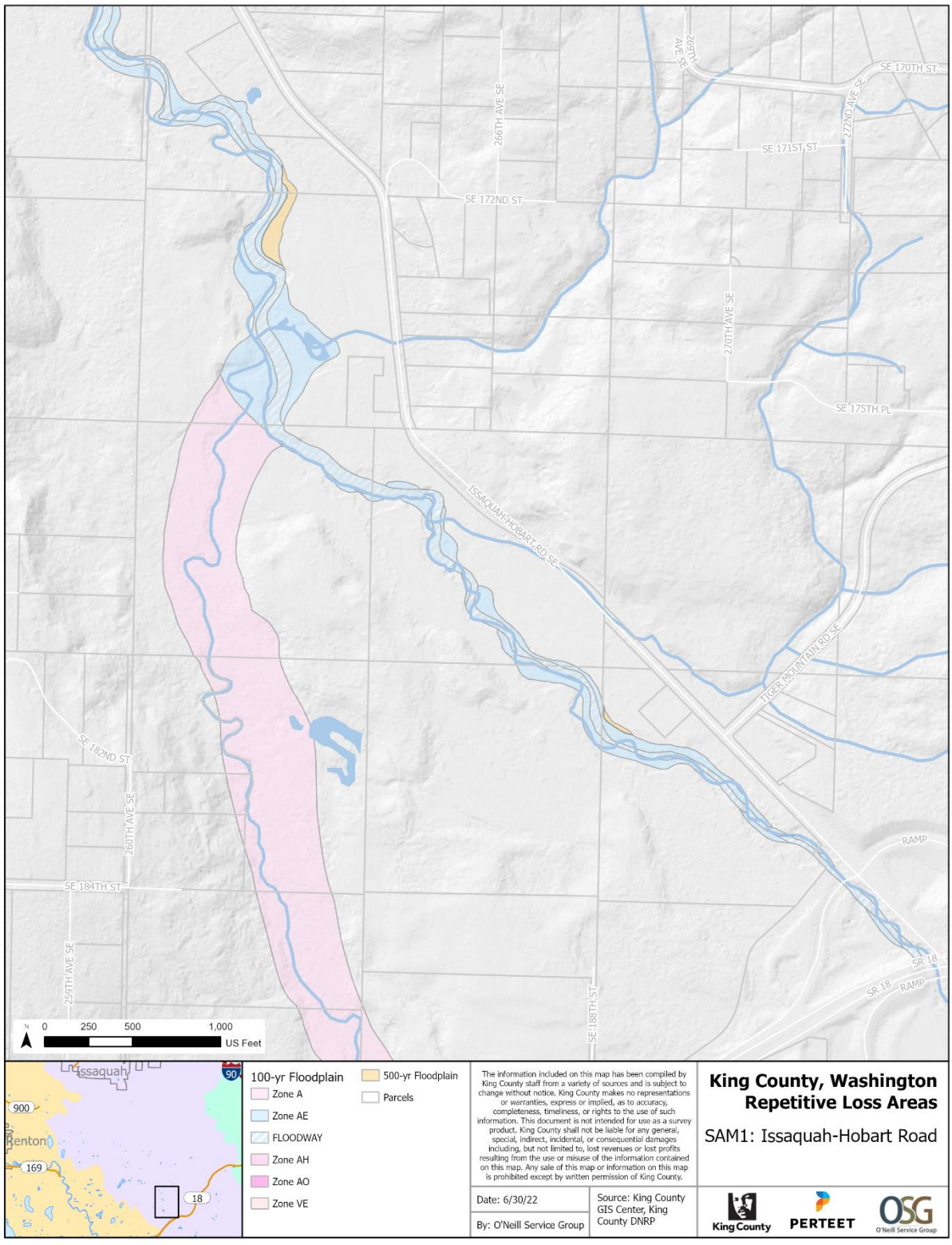


Exhibit 35. Issaquah-Hobart Road (SAM 1).

Repetitive Loss Area 2: May Valley (SAM 2)

In accordance with the Privacy Act of 1974, information about individual repetitive loss properties will not be shared with the general public.

This residential property is located along Issaquah Creek and is outside of the 100-year floodplain. The house experienced flooding in 1990 and 1996.

Exhibit 36. Repetitive Loss Area Summary (SAM 2).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
May Valley	1	0	0	0	1	1

Exhibit 37. Repetitive Loss Area Detailed Analysis (SAM 2).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1983	Crawl space	Good

Exhibit 38. Repetitive Loss Area Field Survey Data (SAM 2).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	Unknown			X		X	

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

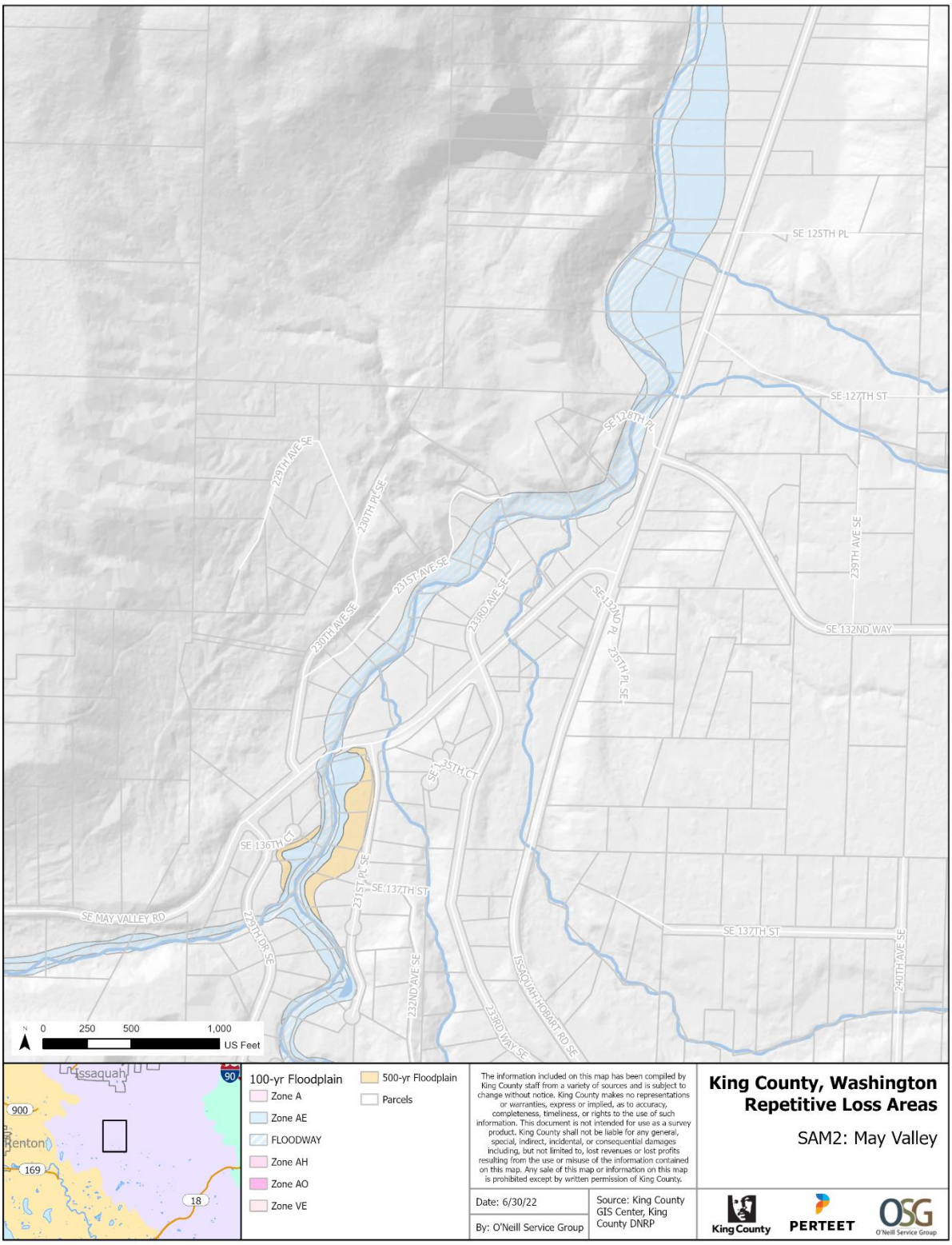


Exhibit 39. May Valley (SAM 2).

Repetitive Loss Area 3: Redmond (SAM 3)

In accordance with the Privacy Act of 1974, information about individual repetitive loss properties will not be shared with the general public.

This residential property is located near Redmond and is not near a watercourse or floodplain. The house sits in a depression at the bottom of a hill. There is a catch basin in the road, but it does not help with runoff because the garage and house sit very low. Other houses in the area are sloped to have water run off into the street or stormwater areas. The owners filed flood insurance claims in 2007 and 2010, but there have likely been additional damaging flood events that led to the purchase of flood insurance.

Exhibit 40. Repetitive Loss Area Summary (SAM 3).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Redmond	1	0	0	0	1	1

Exhibit 41. Repetitive Loss Area Detailed Analysis (SAM 3).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1988	Slab on grade	Good

Exhibit 42. Repetitive Loss Area Field Survey Data (SAM 3).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	L					X	

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

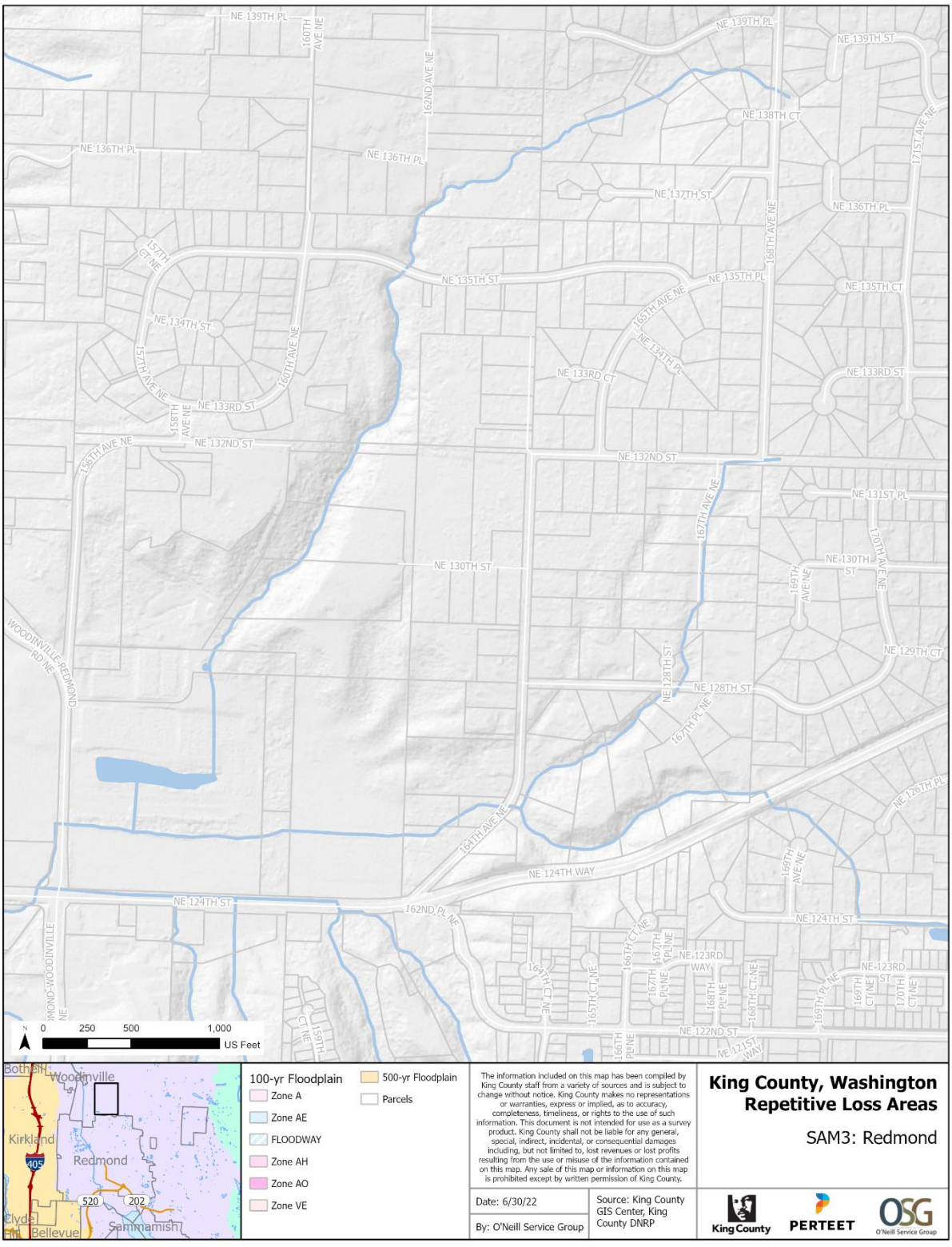


Exhibit 43. Redmond (SAM 3).

BASIN 3 – SOUTH FORK SKYKOMISH RIVER BASIN

The South Fork Skykomish River Basin includes Beckler River and Miller River. The South Fork Sykomish River joins the North Fork Skykomish River just downstream of King County, near Index in Snohomish County. Formed at the confluence of the Tye and Foss Rivers about 13 river miles upstream of the King and Snohomish County line, the South Fork Skykomish River is a relatively unpolluted and free-flowing river, with no significant dams in the watershed. It includes several waterfalls and feeds the Snohomish River which empties into Puget Sound at Port Gardner in Everett. The State of Washington has designated many portions of the South Fork Skykomish as scenic.

Homes and other structures at many locations along the South Fork Skykomish River have suffered damage from deep and fast-moving water resulting from floods. The largest flood on record in Gold Bar (Snohomish County) occurred in November 1990, when South Fork Skykomish River flows reached 102,000 cubic feet per second. This flood also inundated the Town of Skykomish in King County. During significant flood events, homes in the Town of Skykomish have been struck by flood-borne debris moving at high speeds.

The South Fork Skykomish River Basin has 4 repetitive loss areas, 6 unmitigated properties, 8 mitigated properties, and 40 total properties.

Current projects in the Skykomish Basin include:

South Fork Skykomish Repetitive Loss Mitigation
The repetitive loss program funds elevation or buyout of individual structures in the South Fork Skykomish Basin to eliminate the risk of flooding or erosion damage during future flood events.

Timberlane Village Revetment Repair
This project repairs a in Timberlane Village on the South Fork Skykomish River. The revetment is now in poor condition and if left unmodified, the large rocks could fall unexpectedly creating a hazard for people walking along the river and/or cause aquatic degradation.

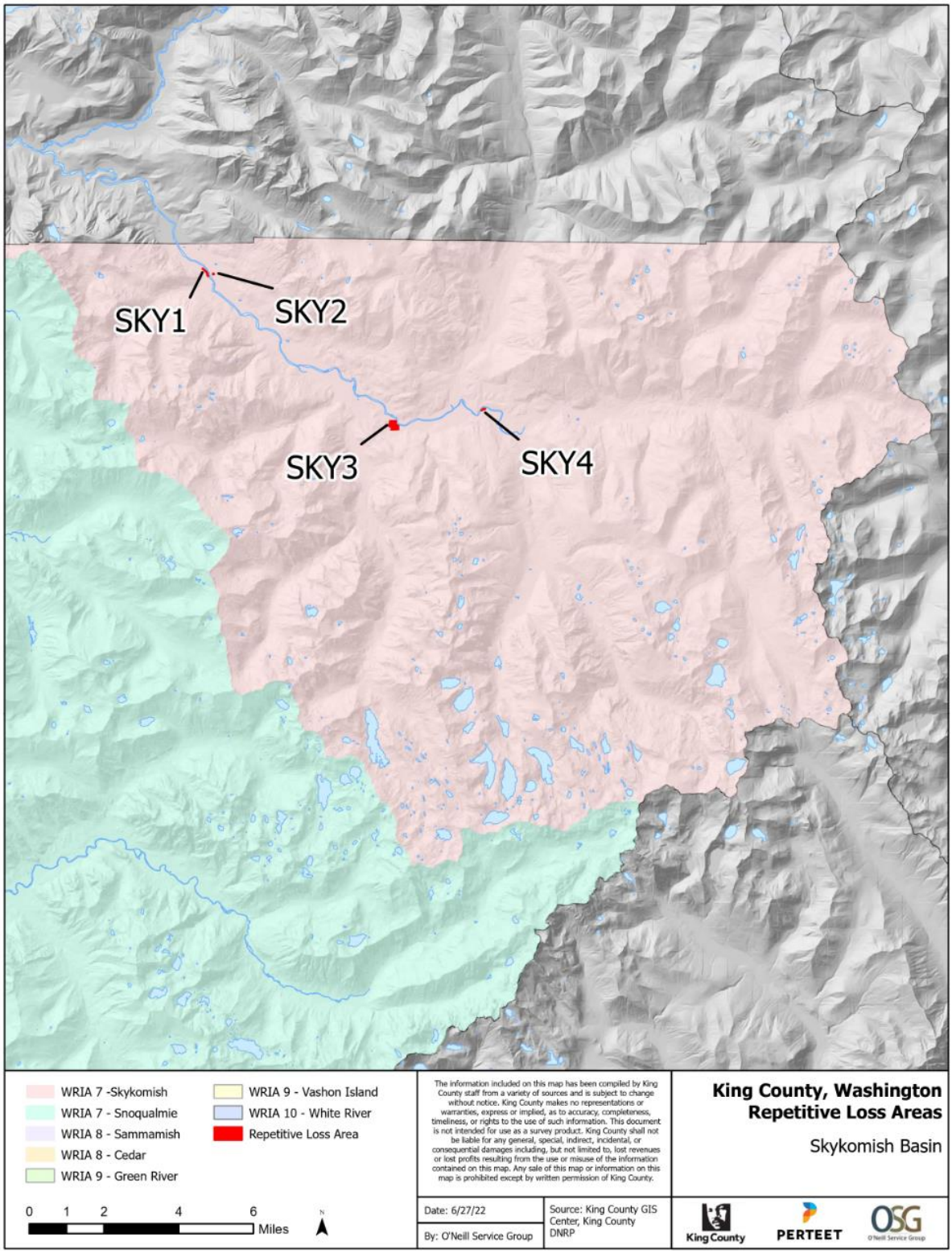


Exhibit 44. Skykomish River Basin.

Repetitive Loss Area 1: Skylandia (SKY 1)

Skylandia is a residential neighborhood located on the left bank of the South Fork Skykomish River. Many of the homes were constructed in the 1960s and 1970s and most of the homes are vacation cabins. The properties in the repetitive loss area are along the riverfront and in the floodway, and experience flooding when the river overtops its banks.

Residents reported that elevating structures has reduced flood damage.

Exhibit 45. Repetitive Loss Area Summary (SKY 1).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Skylandia	3	1	5	6	4	15

Exhibit 46. Repetitive Loss Area Detailed Analysis (SKY 1).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1972	Slab on grade	Average
			1962	Piers	Average
			2000	Slab on grade	Good
			1972	Piers	Average
			1994	Piers	Good
			1976	Crawl space	Average
			1972	Crawl space	Average
			1971	Piers	Good
			1981	Crawl space	Good

Exhibit 47. Repetitive Loss Area Field Survey Data (SKY 1).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A				X	X	
	A	X					
	A				X	X	
	A	X		X		X	
	A				X	X	
	A	X		X		X	
	A				X		
	A				X		
	L	X			X		

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

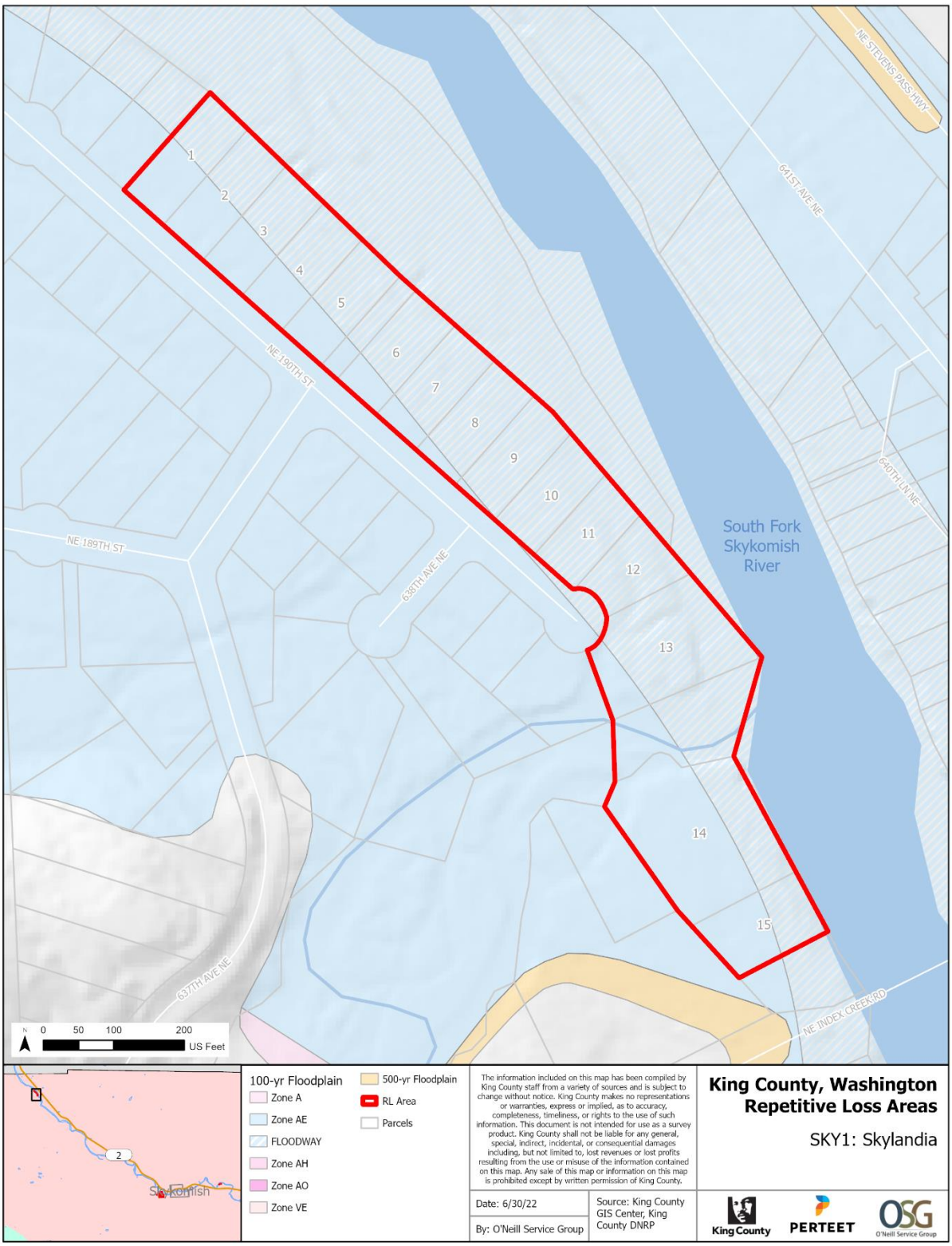


Exhibit 48. Skylandia (SKY 1).

Example Properties

Repetitive Loss Area 2: Index Creek (SKY 2)

In accordance with the Privacy Act of 1974, information about individual repetitive loss properties will not be shared with the general public.

This property is located in a low spot along the South Fork Skykomish River and is exposed to flooding when the river overtops the banks.

Exhibit 49. Repetitive Loss Area Summary (SKY 2).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Index Creek	1	0	0	0	1	1

Exhibit 50. Repetitive Loss Area Detailed Analysis (SKY 2).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			Unknown	Slab on grade	Good

Exhibit 51. Repetitive Loss Area Field Survey Data (SKY 2).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X		X		X	

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

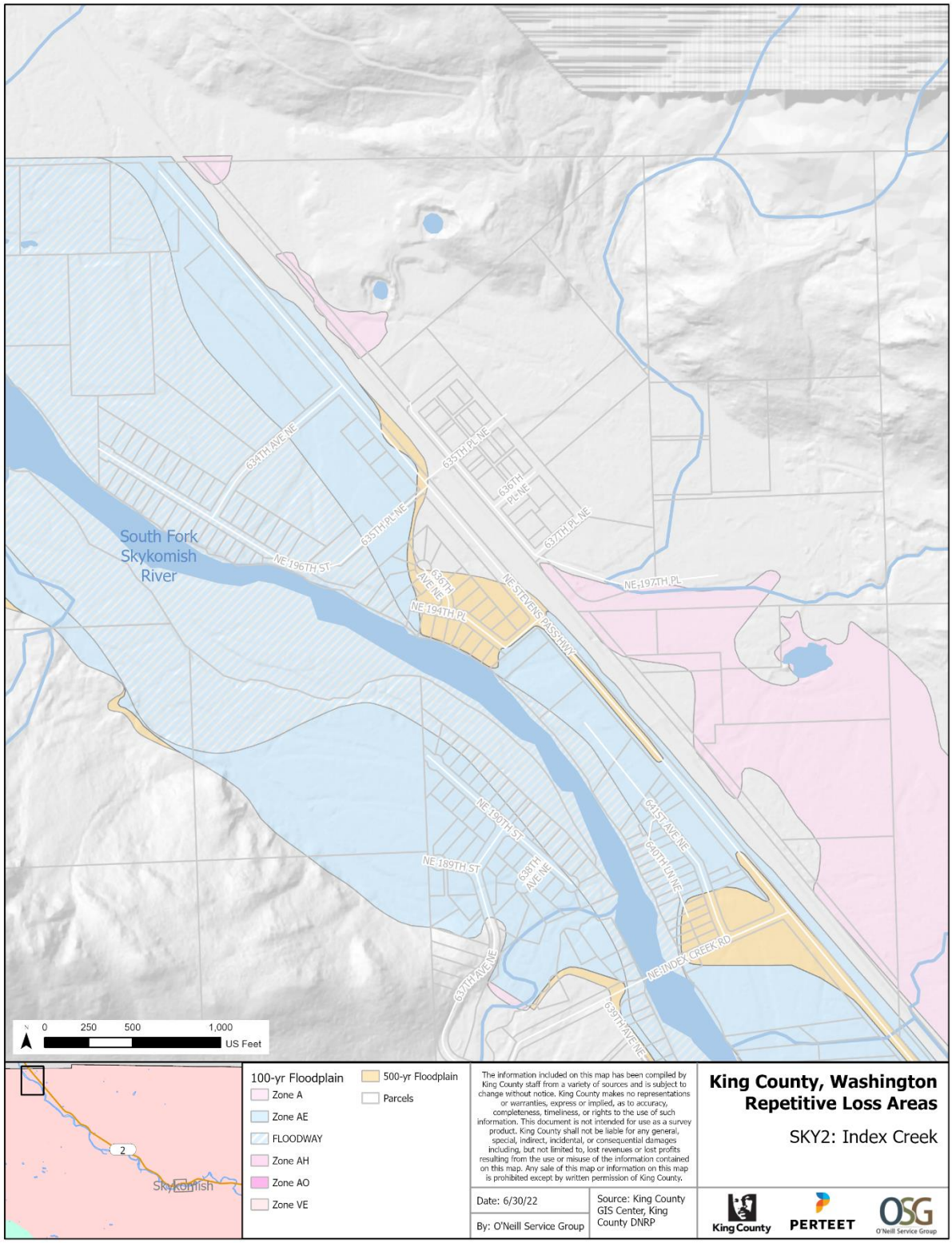


Exhibit 52. Index Creek (SKY 2).

Repetitive Loss Area 3: Old Cascade Highway (SKY 3)

The neighborhood along Old Cascade Highway is mostly outside of the effective 100-year floodplain, but proposed floodplain boundaries include the area. Even though the area is separated from the river by railroad tracks, the area experiences flooding due to backwater collecting behind the railroad tracks from Maloney Creek, an unnamed tributary, and runoff from the hillside. The backwater inundates the properties, especially those that are situated on lower grade.

King County Road Services is currently preparing to start a project that will replace culverts and clean out ditches alongside the Old Cascade Highway to reduce the risk of flooding and road damage. Two culverts are in this repetitive loss area. The project is funded FEMA as a result of major flooding in 2011 that rerouted the East Fork Miller River and washed out a section of roadway.

Residents reported that a stream crossing through the neighborhood has been a problem. Additionally, the culvert crossing the BNSF railroad tracks does not have a backflow preventer and when the river is high it back flows into the neighborhood.

Exhibit 53. Repetitive Loss Area Summary (SKY 3).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Old Cascade Highway	1	1	4	11	4	15

Exhibit 54. Repetitive Loss Area Detailed Analysis (SKY 3).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1992	Crawl space	Good
			1924	Slab on grade	Poor
			1923	Crawl space	Poor
			1924	Slab on grade	Average
			1924	Crawl space	Good
			1945	Crawl space	Good
			1927	Slab on grade	Good
			1924	Slab on grade	Poor
			1927	Slab on grade	Average

Exhibit 55. Repetitive Loss Area Field Survey Data (SKY 3).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	H	X		X		X	
	A	X					
	L	X		X		X	
	H					X	
	L	X					
	H					X	
	A	X		X		X	
	A	X		X		X	
	A	X		X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

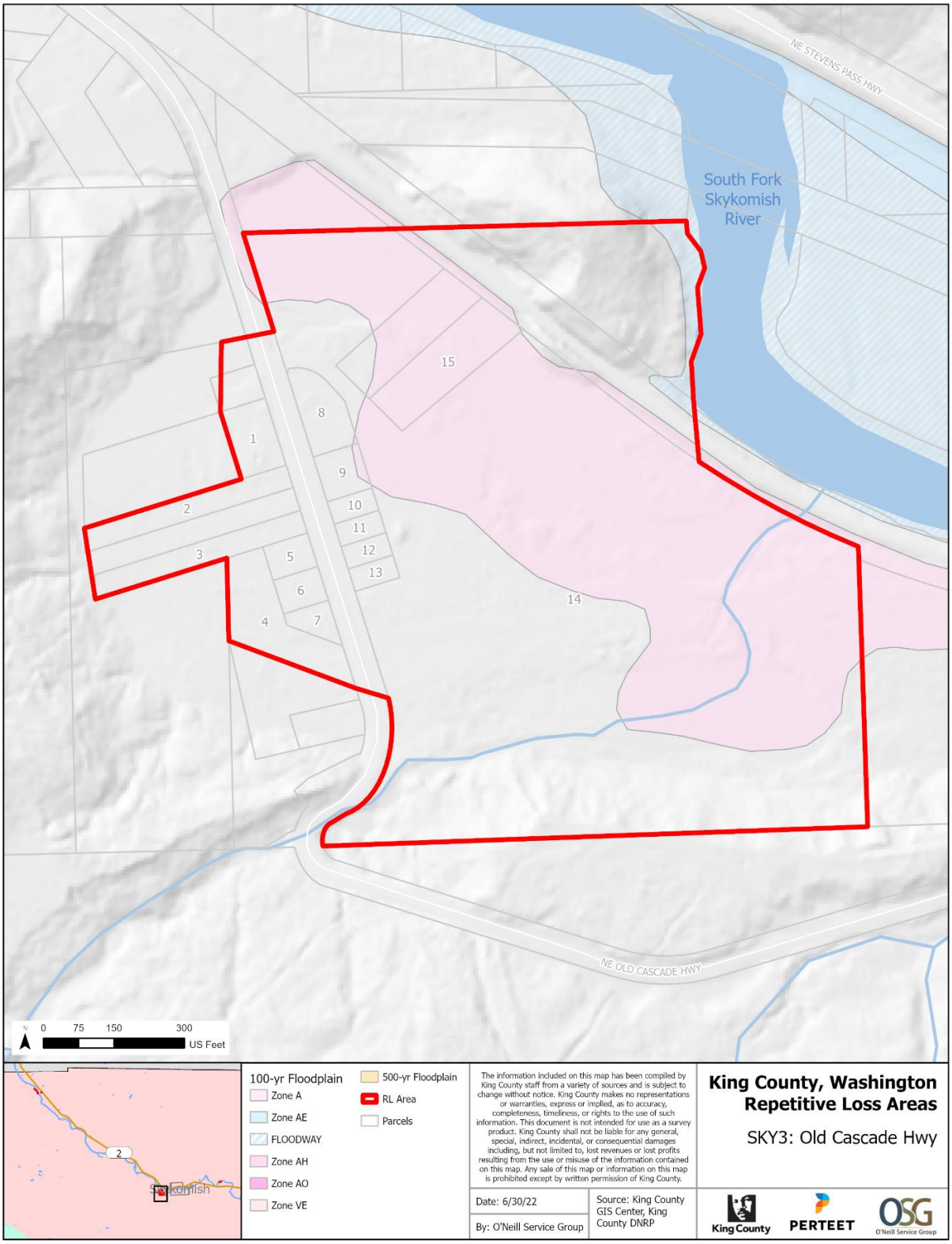


Exhibit 56. Old Cascade Highway (SKY 3).

Example Properties

Repetitive Loss Area 4: Timberlane Village (SKY 4)

Timberlane Village is a residential neighborhood located on the left bank of the South Fork Skykomish River and is entirely located within the 100-year floodplain. Approximately half of each parcel is located in the floodway. The neighborhood was platted in the 1930s and many of the homes in the repetitive loss area were constructed between 1930 and 1979. The area is on a bend in the river and experiences overbank flooding. The higher right bank forces the floodwaters into the lower elevation portion of the Timberlane Village neighborhood, flooding yards and houses.

Exhibit 57. Repetitive Loss Area Summary (SKY 4).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Timberlane Village	1	1	2	7	3	9

Exhibit 58. Repetitive Loss Area Detailed Analysis (SKY 4).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1979	Crawl space	Good
			1969	Slab on grade	Good
			1930	Slab on grade	Poor
			1936	Slab on grade	Good
			1936	Slab on grade	Average
			2018	Piers	Good
			1978	Piers	Average

Exhibit 59. Repetitive Loss Area Field Survey Data (SKY 4).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X		X			
	A						
	L	X		X			
	A	X		X			
	H	X		X	X	X	
	A	X		X			
	H	X		X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

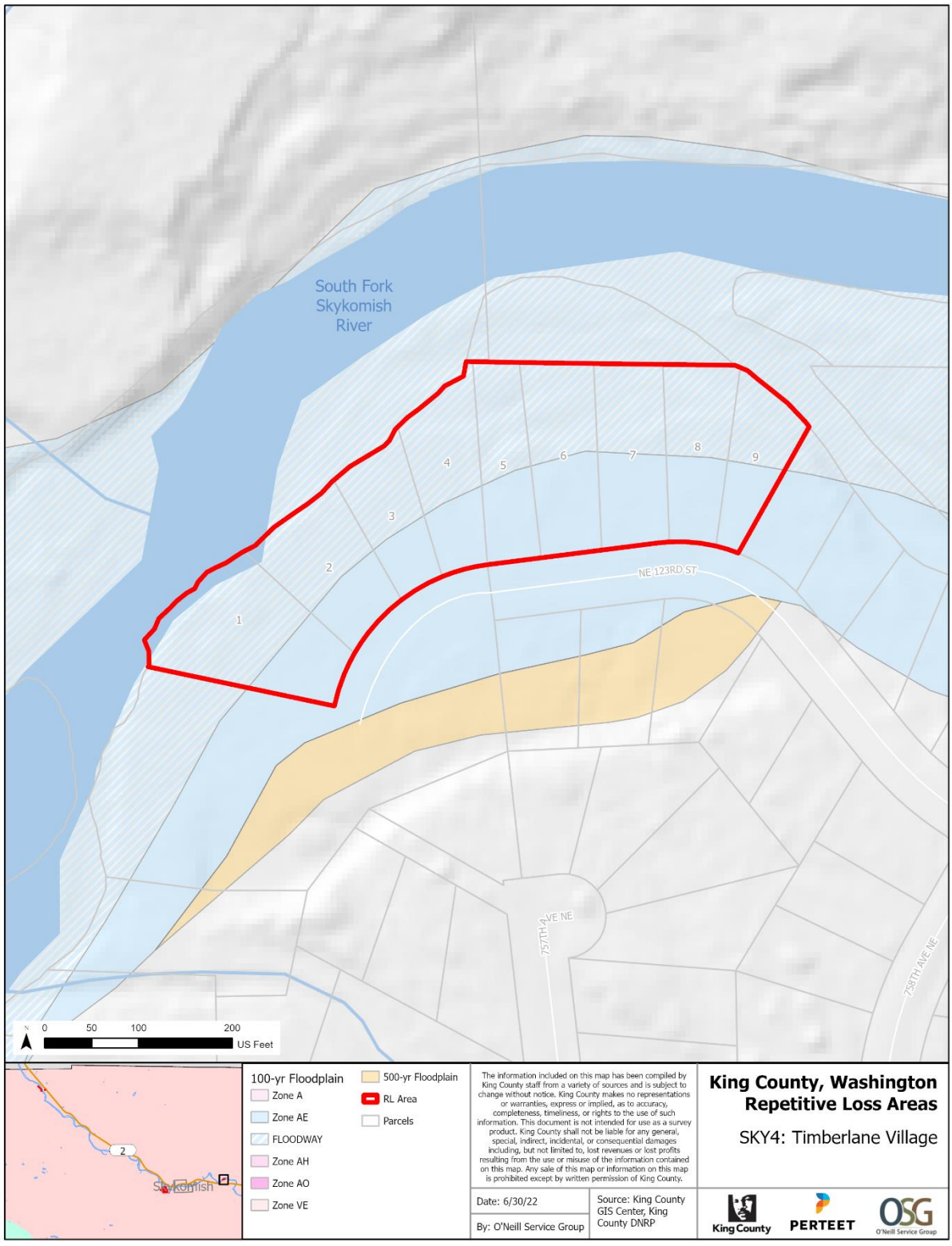


Exhibit 60. Timberlane Village (SKY 4).

Example Properties

BASIN 4 – SNOQUALMIE RIVER BASIN

The Snoqualmie River Basin has the majority of the County's repetitive loss properties. The basin has 22 repetitive loss areas, 65 unmitigated properties, 77 mitigated properties, and 451 total properties.

Upper Snoqualmie River

The Snoqualmie River's three forks (North Fork, Middle Fork, and South Fork) begin in the high peaks of the Cascades, follow steep watercourses through the mountains and the City of North Bend, and combine to form the mainstem Snoqualmie River at the confluence near the foot of Mount Si and City of Snoqualmie. The river flows through the City of Snoqualmie and over Snoqualmie Falls. The City of Snoqualmie is one of the most flood prone cities in the United States.

Land uses along the Snoqualmie River in North Bend and Snoqualmie primarily consist of residential and commercial uses. Rural residential and forestry dominate the upper basin. Flows along the forks are unregulated, with no major reservoirs in the system. Several hydroelectric facilities divert flows, including a dam operated by Puget Sound Energy immediately above Snoqualmie Falls. All of the hydroelectric facilities in this sub-basin lack sufficient storage volumes to control downstream flooding.

The highest flow recorded on the Snoqualmie River from the upper basin was 78,800 cubic feet per second in November 1990 at the Snoqualmie River near Snoqualmie gage (USGS 12144500). Major flooding occurred in 1996, 1999, 2003, 2006, 2008, and 2009, in some cases damaging levees and necessitating repairs.

Lower Snoqualmie River

The Lower Snoqualmie River basin begins at Snoqualmie Falls and generally drains north toward Snohomish County. The river meanders in wide loops through a largely agricultural valley floodplain, passing through the unincorporated community of Fall City and the cities of Carnation and Duvall. Aside from these three residential and commercial centers, most of the lower Snoqualmie valley supports rural residential, agricultural, and recreational land uses.

The Snoqualmie River is prone to flooding and typically has annual multiple flood events that inundate local farmland and close low-lying roads. Flooding causes significant property, economic, and social losses to residents, businesses, and farms. Impacts include injuries to citizens, health hazards, economic and property damages, lost revenue, and increased demand on public safety and infrastructure-related services.

Tolt River

The Tolt River is a major tributary that enters the Snoqualmie River from the east, near the City of Carnation. Its headwaters are at the crest of the Cascades. Land use in the Tolt River valley is primarily residential with lower density development in the upstream valley and higher density development downstream. The upper reaches of the Tolt River basin are mostly within the Forest Production District, where timber harvesting has occurred on an ongoing basis since the early 1900s. The City of Seattle operates a water supply and hydroelectric power dam on the South Fork Tolt River, which was completed in 1963.

Most of the Tolt River basin is in unincorporated King County. The City of Carnation is located along the north bank of the river. Flood and erosion hazards affect unincorporated areas and incorporated areas. Levees line both banks from about River Mile 2 to the mouth. The State Route 203 Bridge crosses the Tolt River at River Mile 0.55 and the Snoqualmie Valley Trail Bridge, formerly a railroad bridge, crosses the Tolt River at River Mile 1.1.

Major floods on the Tolt River have occurred in 1990, 1995, and 1996, in some cases damaging levees and necessitating repairs.

Investments in the Snoqualmie River basin are guided by a Capital Investment Strategy (CIS). There are currently strategies identified for the Middle Fork Snoqualmie River, South Fork Snoqualmie River, and the Tolt River.

Current projects in the Snoqualmie River Basin include:

Residential Flood Mitigation – Property Acquisition
Mitigation of properties in this basin that are at risk from severe channel migration hazards are considered for acquisition as part of the Residential Flood Mitigation – Property Acquisition project identified in the Middle Fork Snoqualmie River CIS when approached by individual landowners.

Circle River Ranch (South Fork Snoqualmie)
This project evaluates actions to reduce long term risks from channel migration in the Circle River Ranch neighborhood on the South Fork Snoqualmie River north of the City of North Bend. The project is scheduled for completion in 2024.

Reinig Road Revetment Repair
This project, completed in 2021, implemented short-term risk reduction measures and permanent repairs of damages to three sections of the Reinig Road Revetment along Reinig Road located between River Mile 41.75 and River Mile 41.84 on the Snoqualmie River.

SR 203 Bridge Improvements Feasibility Study
This feasibility study evaluates the opportunities, costs, and benefits of providing increased flood water flow through the SR 203 Bridge and road as you approach the bridge. The study will look at modifications to the existing bridge and/or the addition of culverts or additional bridges north of the existing bridge to reduce flooding on SR 203.

Tolt River Level of Service Analysis
This project conducts a detailed technical analysis to optimize the levels of protection provided by new levee systems in the lower two miles of the Tolt River in order to maximize public safety. The project will also include technical analysis that will investigate project sequencing and the resulting flood effects, both downstream and upstream, that might result.

Tolt River Sediment Management Feasibility Study
This project conducted a sediment management feasibility study in order to determine if sediment removal is a feasible and effective flood risk reduction tool for the lower approximately two miles of the Tolt River. The study also reviewed and updated previous analyses of sediment production in the upper Tolt River basin and sedimentation rates in the lower two miles of the Tolt River.

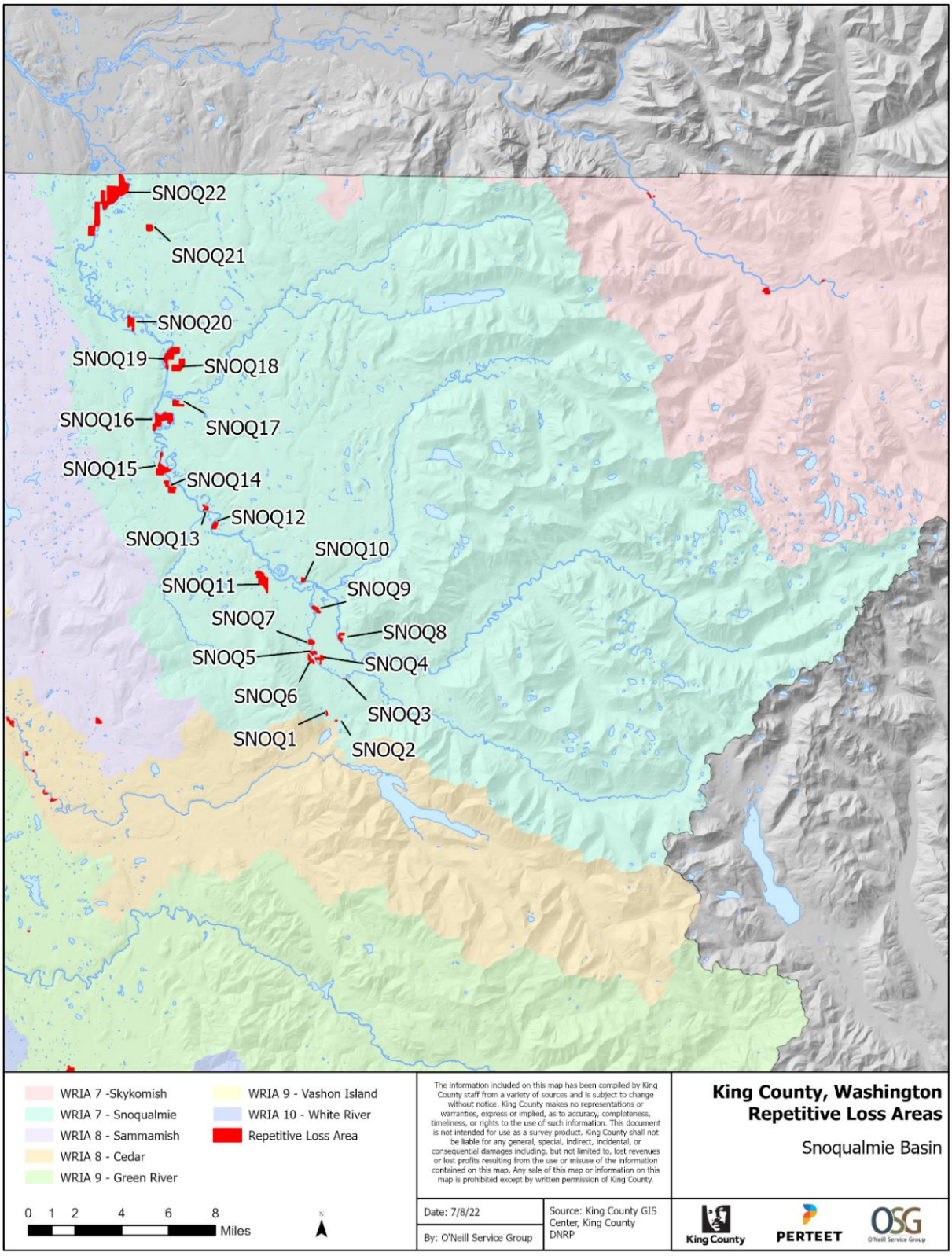


Exhibit 61. Snoqualmie River Basin.

Repetitive Loss Areas 1 and 2: Wilderness Rim (SNOQ 1) and 177th Street SE (SNOQ 2)

The Wilderness Rim neighborhood and adjacent properties on 177th Street SE are located outside of the 100-year floodplain. These areas experience damaging flooding due to groundwater and runoff collecting in depressions. At Wilderness Rim, the flooding is associated with a stormwater pond maintained by King County that is sited in one of the lowest spots in the development. The County completed a capital improvement project on the pond to remediate the flooding and acquired four frequently flooded properties (three repetitive loss properties). Other properties have been elevated to reduce the risk of flood damage. At 177th Street SE, the properties are located at the base of a hill and within a depression where runoff and groundwater naturally collects.

Exhibit 62. Repetitive Loss Area Summary (SNOQ 1 and 2).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Wilderness Rim	1	3	4	13	6	18
177th Street SE	1	0	0	2		3

Exhibit 63. Repetitive Loss Area Detailed Analysis (SNOQ 1 and 2).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			2004	Unknown	Average
			1980	Unknown	Average
			1979	Slab on grade	Average
			1993	Slab on grade	Average
			1978	Slab on grade	Average
			1980	Unknown	Average
			1979	Slab on grade	Average
				Vacant	Vacant
				Vacant	Vacant
				Vacant	Vacant
			1999	Slab on grade	Average
			1977	Slab on grade	Average
			1979	Slab on grade	Average
			1978	Slab on grade	Average
			1970	Slab on grade	Average
			1979	Slab on grade	Average
			1979	Crawl space	Average
			1977	Piers	Average
			1979	Crawl space	Average
			2000	Crawl space	Good

Exhibit 64. Repetitive Loss Area Field Survey Data (SNOQ 1).

Address	First Floor Elevation[1]	Possible Mitigation Options					
		Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A			X		X	
	A			X			
	A			X		X	
	A			X		X	
	A			X			
	A			X		X	
	A			X		X	
	A			X		X	
	A			X		X	
	A			X		X	
	A			X		X	
	A			X		X	
	A			X			
	A			X		X	
	A			X		X	
	A			X			
	A			X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

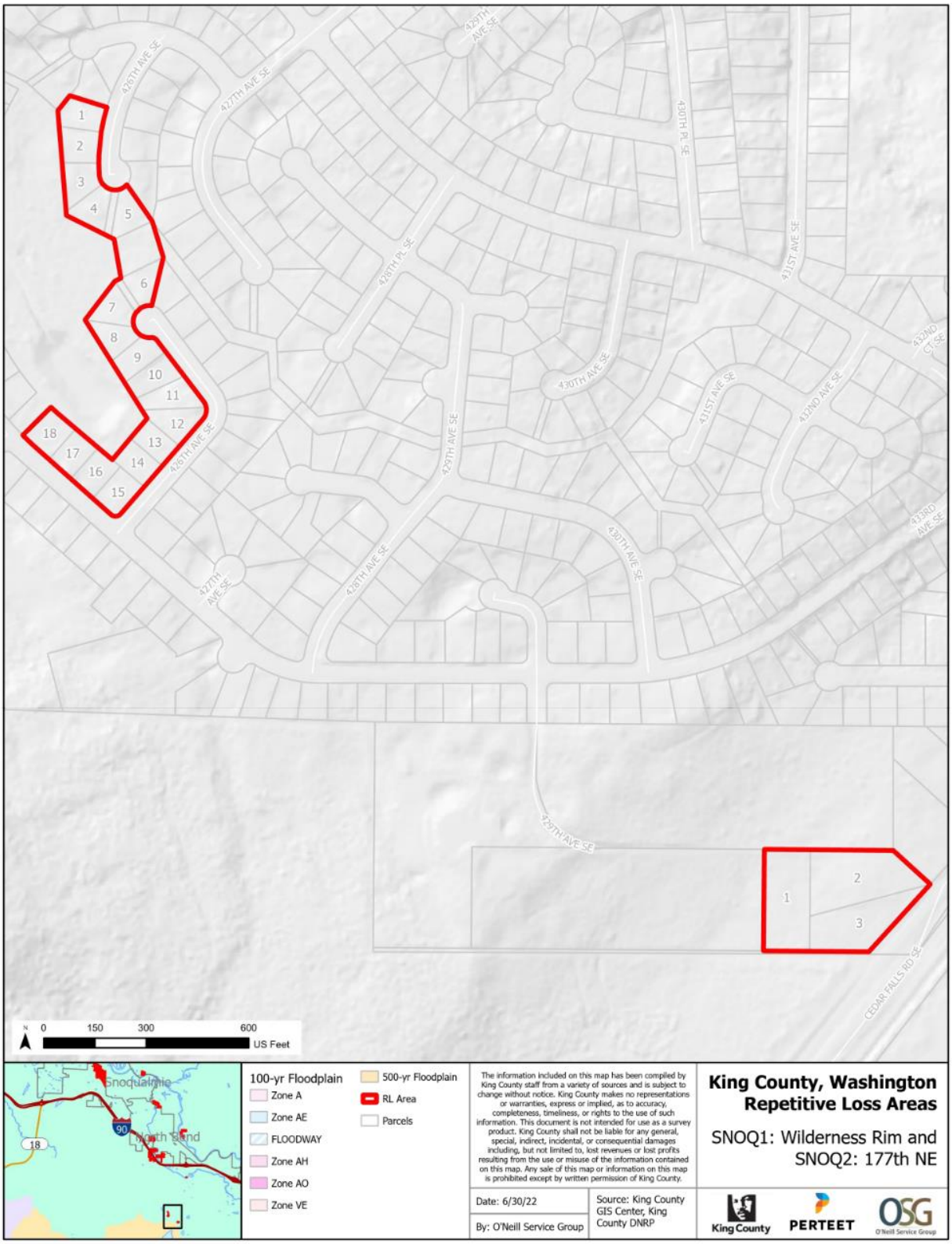


Exhibit 65. Wilderness Rim and 177th Street SE (SNOQ 1 and 2).

Example Properties

Repetitive Loss Area 3: 147th Place SE (SNOQ 3)

This repetitive loss area is located on the right bank of the Middle Fork Snoqualmie River, just upstream of the 436th Avenue bridge. The structures are located in a depression that experiences overland flooding.

Exhibit 66. Repetitive Loss Area Summary (SNOQ 3).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
147th Place SE	1	0	1	1	1	3

Exhibit 67. Repetitive Loss Area Detailed Analysis (SNOQ 3).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.				Vacant	Vacant
			1930	Garage	Average
			1967		Average

Exhibit 68. Repetitive Loss Area Field Survey Data (SNOQ 3).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	Unknown	X					
	Unknown	X					

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

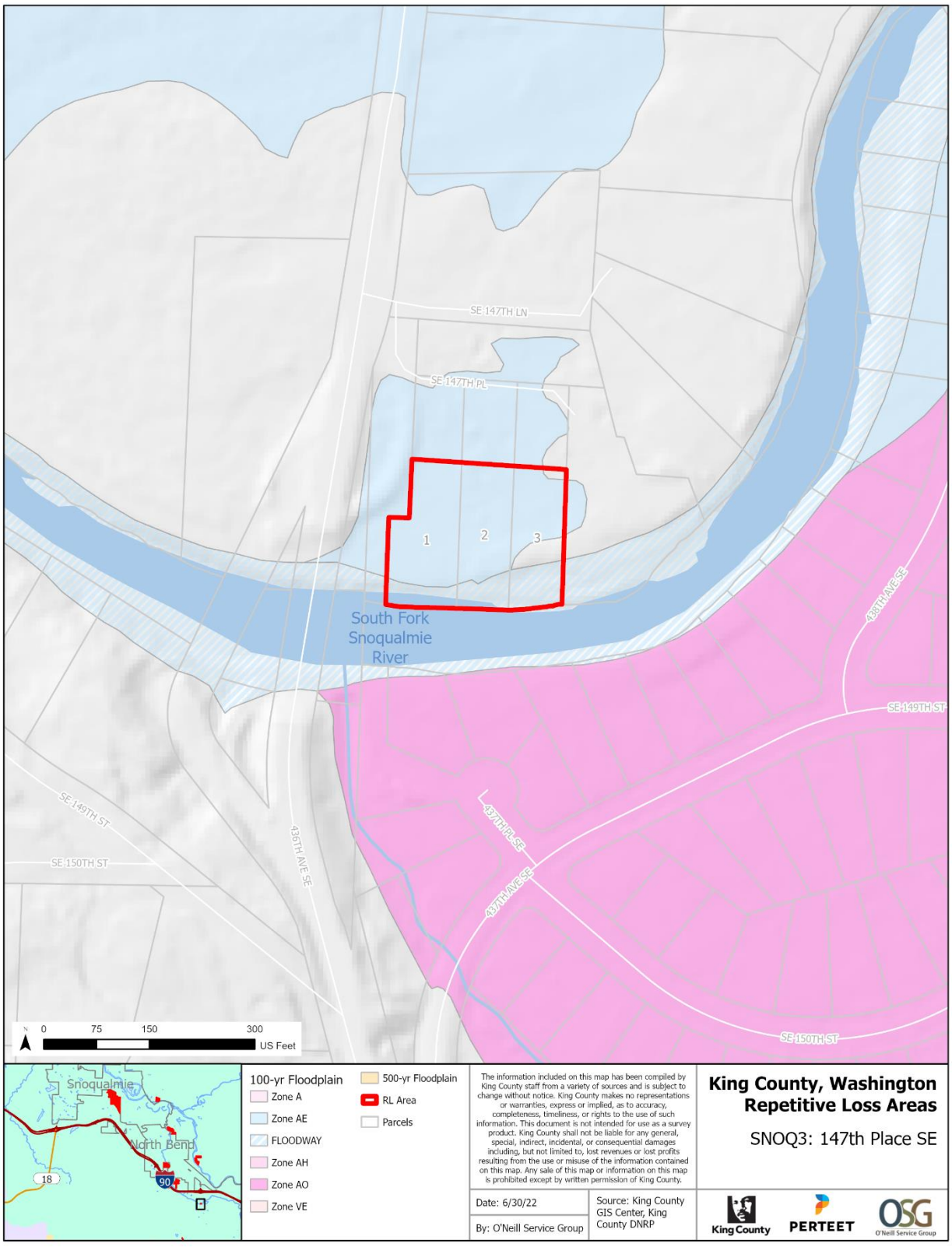


Exhibit 69. 147th Place SE (SNOQ 3).

Example Properties

Repetitive Loss Area 4: 136th Street SE (SNOQ 4)

This repetitive loss area includes part of the Brookside Acres neighborhood and adjacent areas. Most of the homes in this area were constructed in the 1950s and 1960s. The repetitive loss area is within the 100-year floodplain of the South Fork Snoqualmie River. Even though this area is protected by a levee, it experiences flooding when the river is very high. Improvements to the levee in this location are to be considered as part of the Si View Levee Improvements Project identified in the South Fork Snoqualmie River CIS.

Residents reported that the flood maps in the neighborhood are inaccurate and exaggerated, and that management of sediment needs to improve.

Exhibit 70. Repetitive Loss Area Summary (SNOQ 4).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
136th Street SE	1	0	0	23	1	24

Exhibit 71. Repetitive Loss Area Detailed Analysis (SNOQ 4).

Address	# Claims	NFIP Insurance	Year Constructed/ Mitigated	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1965	Crawl space	Average
			1958	Slab on grade	Average
			1977	Slab on grade	Average
			1991	Crawl space	Average
			1953	Unknown	Good
			2001	Crawl space	Good
			1956	Crawl space	Average
			1955	Crawl space	Average
			1956	Slab on grade	Average
			1965	Crawl space	Average
			1970	Slab on grade	Average
			1992	Unknown	Unknown
			1959	Slab on grade	Average
			1987	Crawl space	Good
			1957	Slab on grade	Average
			1962	Crawl space	Average
			1960	Slab on grade	Average
			1977	Crawl space	Average
			1957	Slab on grade	Average
			1953	Garage	Average
			1964	Slab on grade	Average
			1958	Slab on grade	Average
			1980	Crawl space	Average
			1961	Slab on grade	Average

Exhibit 72. Repetitive Loss Area Field Survey Data (SNOQ 4).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	?	X	X	X		X	
	?		X			X	
	?		X				
	A	X		X		X	
	?	X		X		X	
	H	X		X		X	
	?	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	
	A	X		X		X	

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

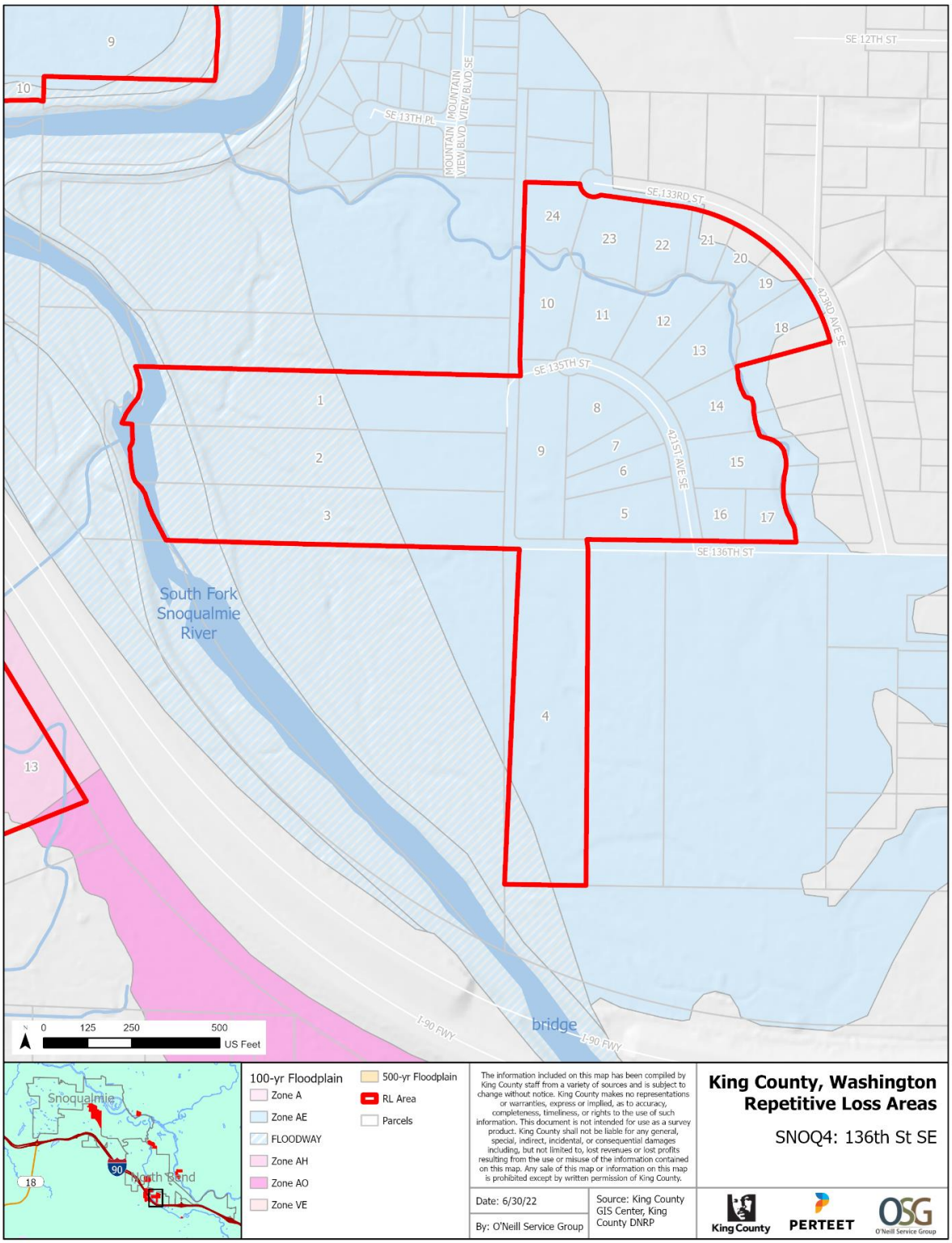


Exhibit 73. 136th Street SE (SNOQ 4).

Flood Photos

Snoqualmie River at 136th Street SE. January 9, 2009.

Example Properties

Repetitive Loss Area 5: 131st Street SE (SNOQ 5)

SE 131st Street is on the inside of a horseshoe shaped bend on the left bank of the South Fork Snoqualmie River. All of the structures within the repetitive loss area are within the 100-year floodplain and were constructed in the 1990s. Within this reach, the river is constrained by levees on both banks. The levee on the right bank is higher, and the river overtops the levee on the left bank during high flows which flood this neighborhood.

Improvements to the levee in this location are to be considered as part of the Reif Road Levee Improvements Project identified in the South Fork Snoqualmie River CIS.

Residents reported that flooding has been worse since the river stopped being dredged and since more land has been developed in the area, and that blocked storm drains may be contributing to flooding.

Exhibit 74. Repetitive Loss Area Summary (SNOQ 5).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
131st Street SE	1	0	0	9	2	10

Exhibit 75. Repetitive Loss Area Detailed Analysis (SNOQ 5).

Address	# Claims	NFIP Insurance	Year Constructed/ Mitigated	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1988	Crawl space	Average
			1994	Crawl space	Average
			1994	Crawl space	Average
			1993	Crawl space	Average
			1993	Crawl space	Average
			1994	Crawl space	Average
			1992	Unknown	Average
			1993	Crawl space	Average
			1989	Crawl space	Average
			1990	Crawl space	Average

Exhibit 76. Repetitive Loss Area Field Survey Data (SNOQ 5).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	L		X		X		
	H	X	X		X		
	A	X	X		X		
	H		X	X	X		
	A	X	X		X		
	L	X	X		X		
	A	X	X		X		
	L	X	X		X		
	L	X	X		X		
	A	X	X		X		

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

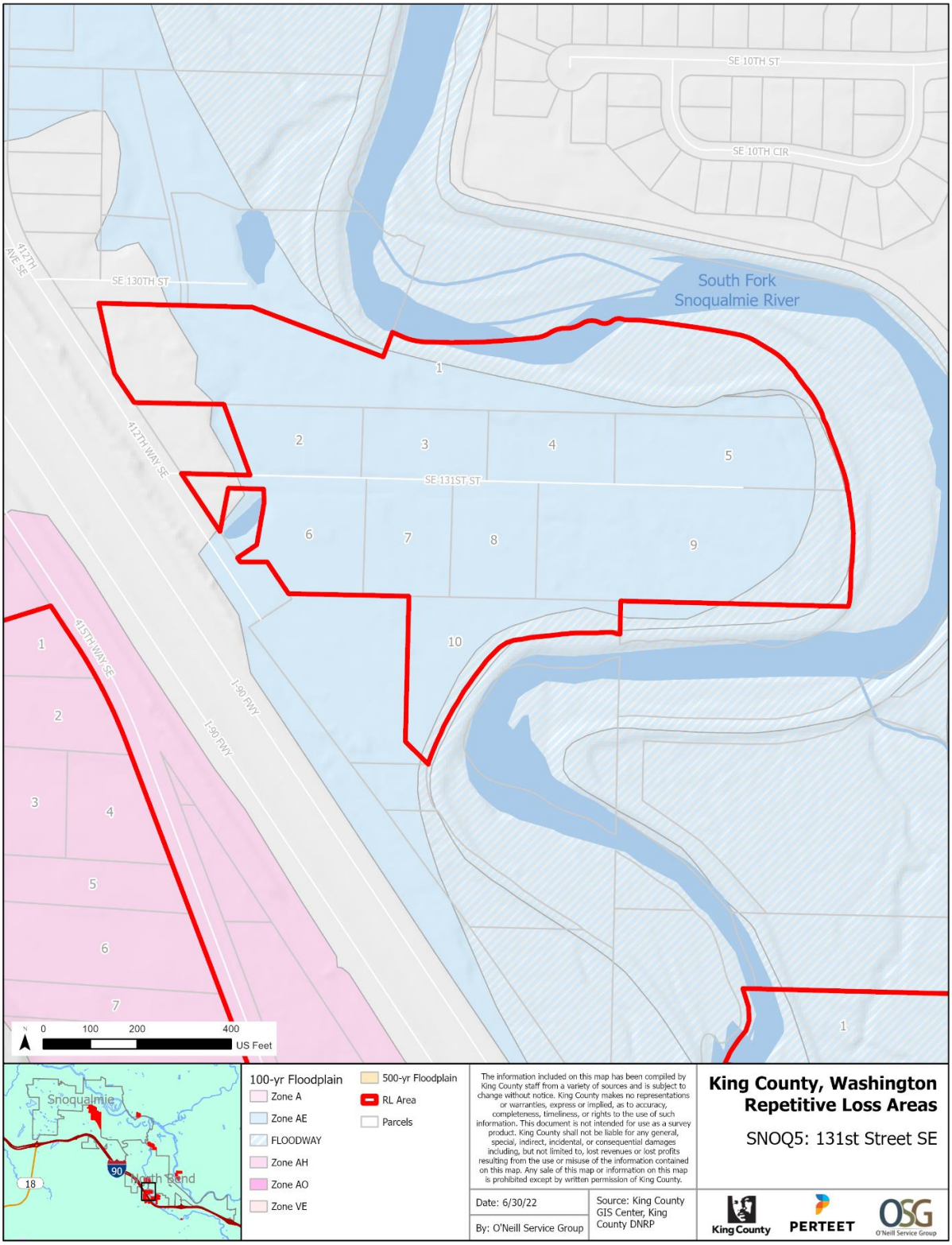


Exhibit 77. 131st Street SE (SNOQ 5).

Flood Photos

Snoqualmie River at 131st Street SE. November 8, 2006.

Snoqualmie River at 131st Street SE. January 7, 2009.

Example Properties

Repetitive Loss Area 6: Clough Creek (SNOQ 6)

Clough Creek is a tributary to the South Fork Snoqualmie River and flows under I-90 through a culvert. The creek is the primary flood source in this neighborhood. High water in the South Fork Snoqualmie creates backwater and prevents drainage. The creek ponds behind I-90 and floods the properties in this repetitive loss area. Improvements to this outfall/confluence location are to be considered as part of the Reif Road Levee Improvements Project identified in the South Fork Snoqualmie River CIS.

Residents reported:

- The severity of flooding has reduced since the retention system was installed, but that flooding still occurs
- A check valve is not operating correctly and stays open all the time
- The trash rack is frequently clogged with debris and does not get cleaned regularly
- Excessive building, clear cutting, and paving in the area has increased flooding

Exhibit 78. Repetitive Loss Area Summary (SNOQ 6).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Clough Creek	2	2	0	9	4	13

Exhibit 79. Repetitive Loss Area Detailed Analysis (SNOQ 6).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1937	Crawl space	Poor
			1938	Basement	Average
			1979	Crawl space	Average
			1982	Combo[1]	Average
			1962	Piers	Average
			1942	Crawl space	Average
			1953	Crawl space	Average
			1963	Piers	Average
			1959	Garage	Average
			1951	Crawl space	Average
			1932	Crawl space	Average
			1972	Basement	Good
			1994	Crawl Space	Average

[1] Crawl space in front, slab on grade addition in the back

Exhibit 80. Repetitive Loss Area Field Survey Data (SNOQ 6).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X					
	A	X					
	H						
	H						
	H						
	A	X					
	A	X					
	L	X	X				
	A		X				
	L	X					
	A						
	A	X					

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

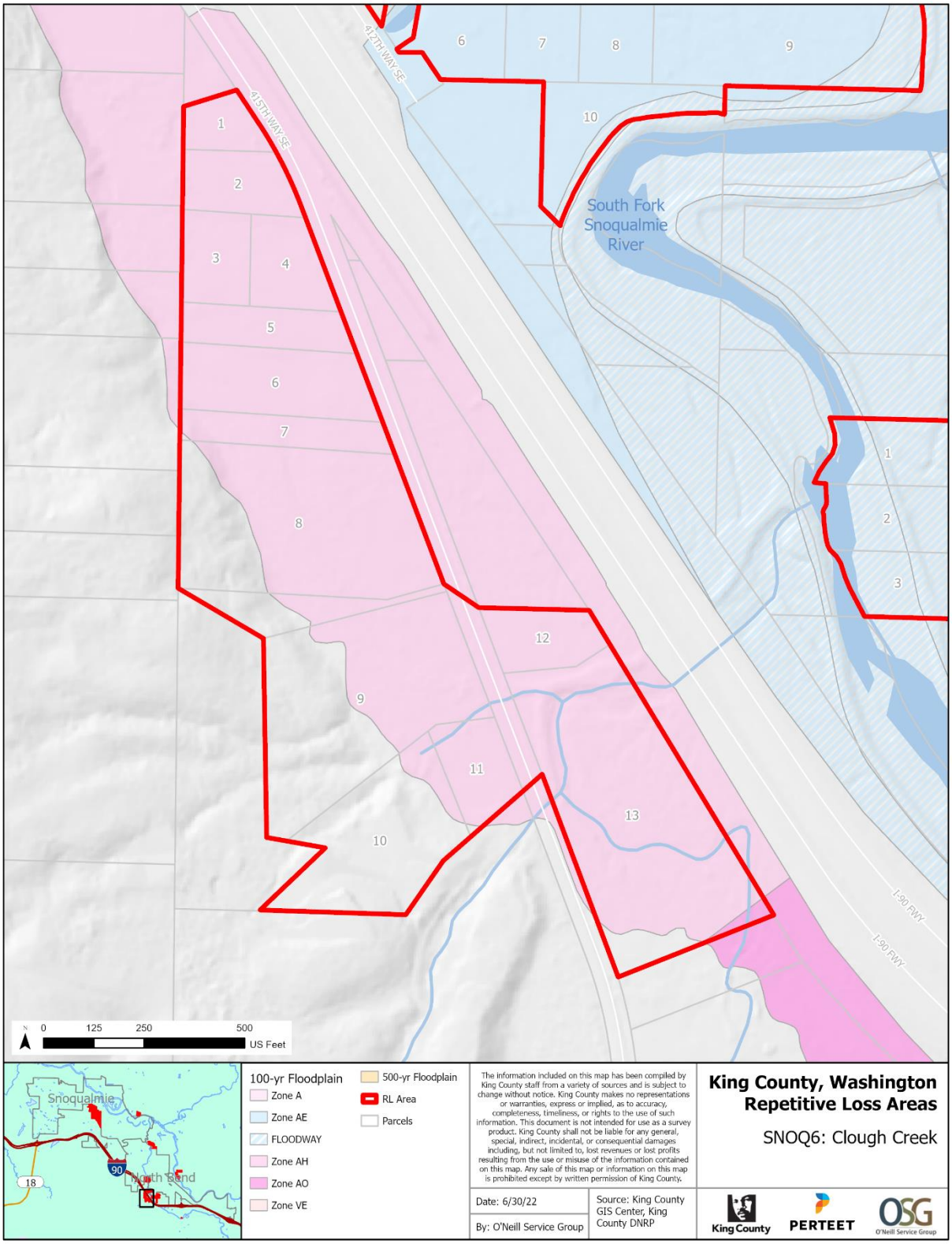


Exhibit 81. Clough Creek (SNOQ 6).

Flood Photos

Snoqualmie River at Clough Creek. January 7, 2009.

Snoqualmie River at Clough Creek. January 7, 2009.

Example Properties

Repetitive Loss Area 7: 413th Avenue SE (SNOQ 7)

This repetitive loss area includes Shamrock Park, Berry Estates, and adjacent parcels and is located on the left bank of the South Fork Snoqualmie River. Most of the residences were constructed in the 1970s and 1980s. Although the area is protected by a levee, the right bank levee is higher which causes this area to flood. Because of the frequency and severity of flooding in this area, the County has focused on mitigating these properties and has mitigated 11 repetitive loss properties and 7 properties not designated as repetitive losses, for a total of 18 mitigated properties of the 45 total in the neighborhood.

Improvements to the levee in this location are to be considered as part of the Reif Road Levee Improvements Project identified in the South Fork Snoqualmie River CIS.

Residents reported that the Highway 202 bridge in North Bend needs to be widened to increase capacity, that flooding has increased since the river stopped being dredged, and that adjacent development may be increasing flooding.

Exhibit 82. Repetitive Loss Area Summary (SNOQ 7).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
413th Avenue SE	4	11	2	29	22	45

Exhibit 83. Repetitive Loss Area Detailed Analysis (SNOQ 7).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1977	Crawl space	Average
			1974	Slab on grade	Average
			1983	Crawl space	Average
			1983	Slab on grade	Average
			1997	Crawl space	Average
			1977	Crawl space	Average
			1977	Crawl space	Average
			1977	Crawl space	Good
			1984	Crawl space	Average
			1969	Crawl space	Average
			1989	Crawl space	Good
				Vacant	Vacant
			1906	Crawl space	Average
			1977	Crawl space	Good
			1977	Crawl space	Average
			1912	Crawl space	Average
			1906	Crawl space	Average
			1970	Crawl space	Average
			1971	Crawl space	Average
			1977	Crawl space	Average
			1947	Crawl space	Average
			1964	Unknown	Good
			1929	Crawl space	Average
			1987	Crawl space	Average
			1987	Crawl space	Average
			1983	Crawl space	Average
			1977	Crawl space	Average
			1984	Crawl space	Average
			1977	Crawl space	Average
			1984	Crawl space	Average
			1977	Crawl space	Average
			1977	Crawl space	Average
			1983	Crawl space	Average
			1971	Crawl space	Average
			1977	Crawl space	Average
			1977	Crawl space	Average
			1974	Crawl space	Average
			1983	Crawl space	Average
			1986	Crawl space	Average
			1983	Crawl space	Average
			1984	Unknown	Average
			1984	Crawl space	Average
			1983	Combo[1]	Average
			1983	Slab on grade	Average
			1984	Crawl space	Average

[1] Partially crawl space with slab on grade converted garage

Exhibit 84. Repetitive Loss Area Field Survey Data (SNOQ 7).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X					
	L		X				
	A	X	X				
	L		X				
	A	X					
	H						
	H						
	H						
	H						
	H						
	H	X					
	H						
	H						
	A	X	X				
	A	X					
	H						
	A	X					
	H						
	A	X					
	A		X				
	A			X			
	H	X	X				
	A	X	X				
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A						
	H						
	A	X					
	A						
	A						
	A						
	H						
	A	X					
	A	X					
	A	X					
	L						
	A	X					
	A						
	A		X				
	A	X					

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

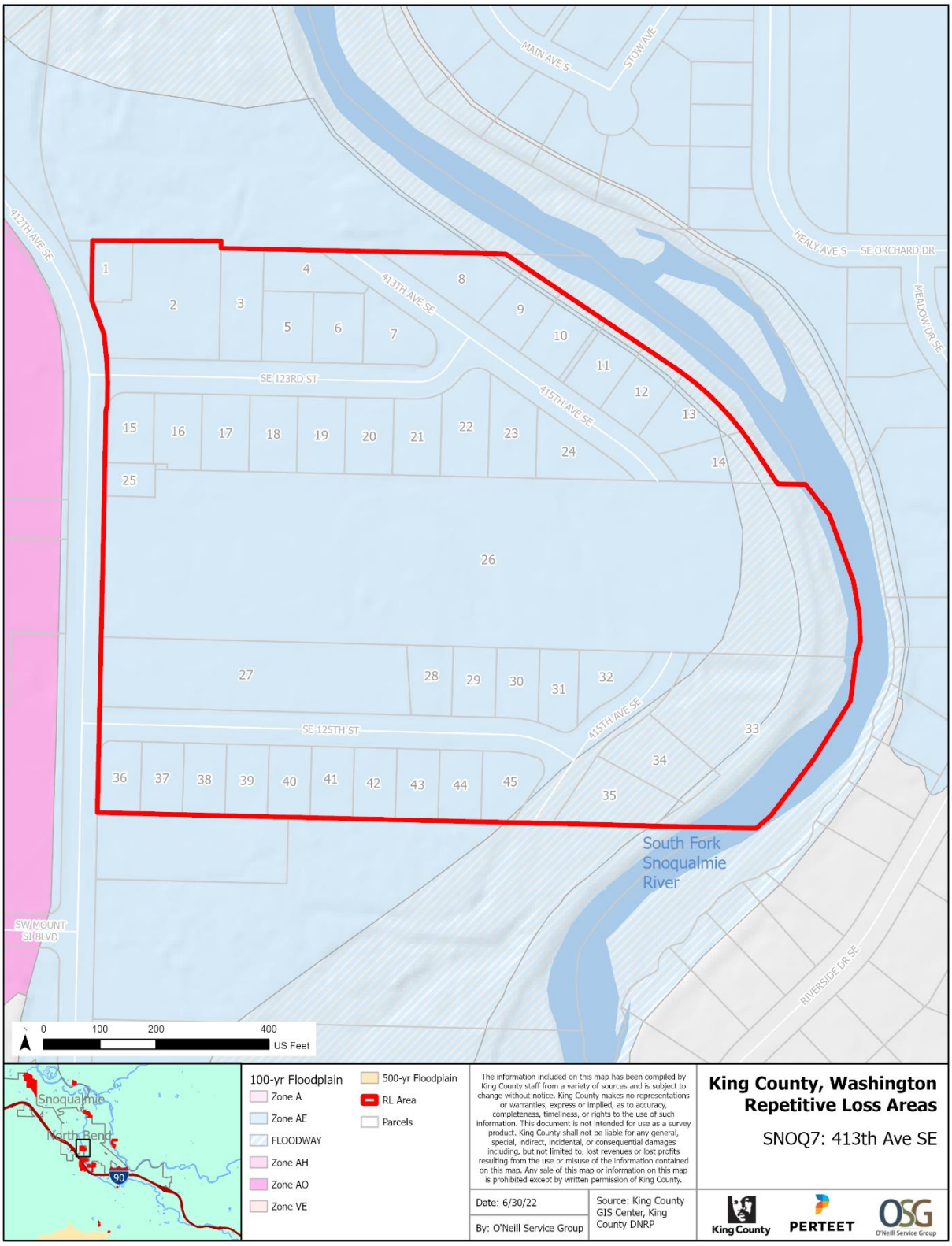


Exhibit 85. 413th Avenue SE (SNOQ 7).

Flood Photos

Snoqualmie River at 413th Avenue SE (Shamrock Park). January 7, 2009.

Snoqualmie River at 413th Avenue SE (Berry Estates). January 7, 2009.

Snoqualmie River at 413th Avenue SE (Shamrock Park). November 23, 1986.

Example Properties

Repetitive Loss Area 8: Mount Si (SNOQ 8)

The Mount Si repetitive loss area is along the right bank of the Middle Fork Snoqualmie River. All of the residences within the repetitive loss area are within the 100-year floodplain and several are within the floodway. In this area, the river's grade begins to flatten and the floodplain becomes expansive, spreading over a wide area and causing overbank flooding.

Exhibit 86. Repetitive Loss Area Summary (SNOQ 8).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Mount Si	1	0	4	17	2	22

Exhibit 87. Repetitive Loss Area Detailed Analysis (SNOQ 8).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1949	Unknown	Average
			1948	Crawl space	Average
			1995	Crawl space	Average
			1995	Crawl space	Average
			1974	Crawl space	Average
			2001	Crawl space	Average
			1990	Unknown	Good
			1996	Unknown	Good
			2012	Crawl space	Average
			2009	Crawl space	Average
			2015	Crawl space	Average
			1995	Garage	Good
			1970	Crawl space	Average
			1951	Crawl space	Poor
			1950	Crawl space	Average
			1945	Crawl space	Average
			1966	Garage	Average

Exhibit 88. Repetitive Loss Area Field Survey Data (SNO 8).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	L	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	?		X				
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X	X			
	H		X				
	H	X	X				
	L		X				
	A	X	X				
	L	X	X				
	A	X	X	X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

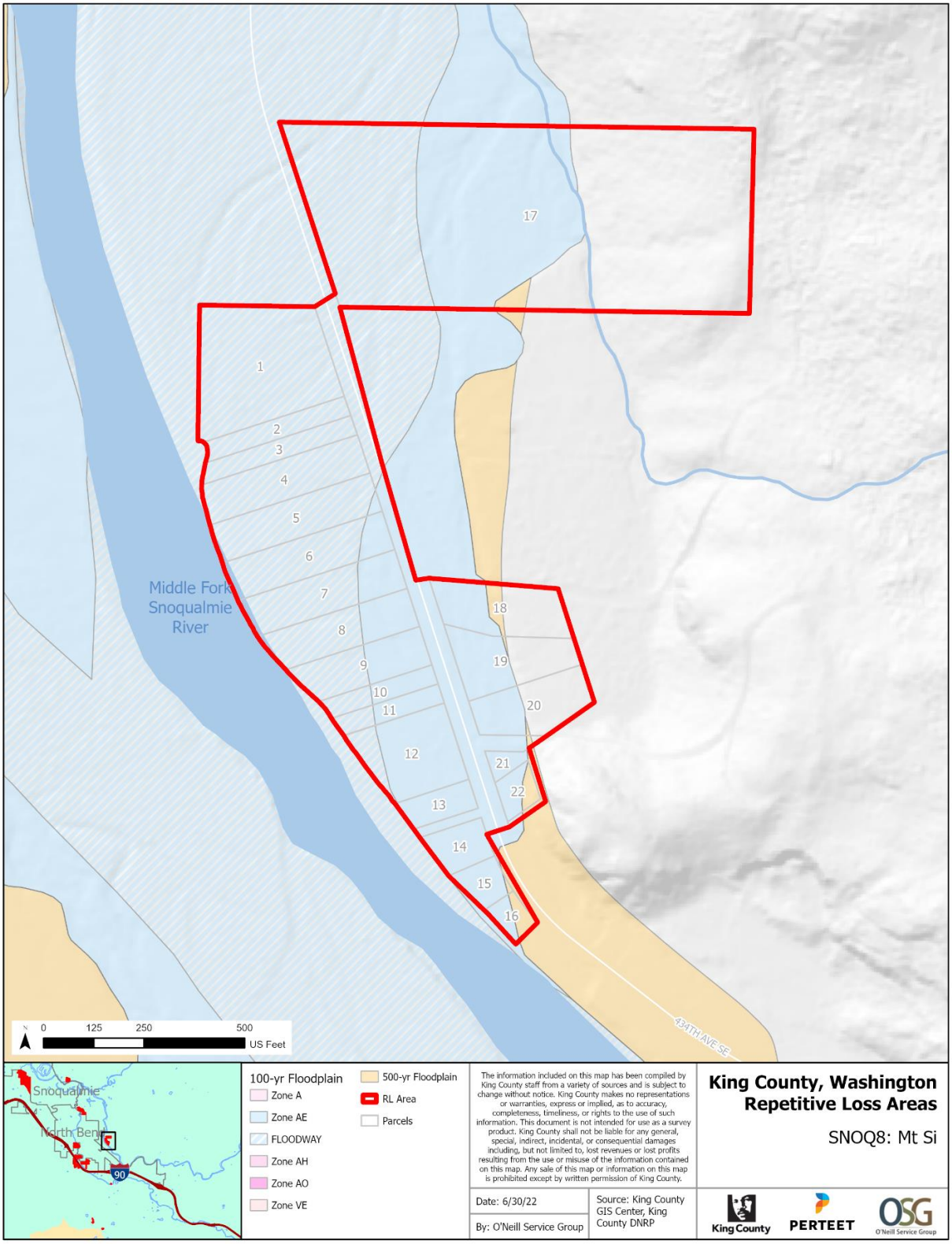


Exhibit 89. Mount Si (SNOQ 8).

Example Properties

Repetitive Loss Area 9: Circle River Ranch (SNOQ 9)

Circle River Ranch is located on the right bank of the South Fork Snoqualmie River, about a mile upstream of the confluence. Most of the repetitive loss area is within the 100-year floodplain. The area experiences overbank flooding and is at risk from erosion and flooding.

The County is currently implementing a risk reduction project in this area, including repair of damage to the upstream end of the existing revetment in the neighborhood through construction of a partially buried setback revetment and acquisition of at-risk homes from willing sellers. Several parcels in the southwest corner were excluded from the repetitive loss area because they were acquired by the County.

Residents reported that flooding seems to be less severe since the work was completed at the Snoqualmie Falls.

Exhibit 90. Repetitive Loss Area Summary (SNOQ 9).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Circle River Ranch	2	0	6	24	6	32

Exhibit 91. Repetitive Loss Area Detailed Analysis (SNOQ 9).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1967	Unknown	Average
			1995	Crawl space	Average
			2000	Crawl space	Average
			1986	Crawl space	Average
			1962	Crawl space	Average
			1982	Unknown	Unknown
			1989	Crawl space	Average
			1967	Crawl space	Average
			1970	Piers	Good
			1963	Crawl space	Average
			1988	Crawl space	Average
			1993	Crawl space	Average
			1989	Crawl space	Average
			1993	Crawl space	Average
			2019	Crawl space	Average
			1966	Crawl space	Average
			2006	Crawl space	Average
			1999	Crawl space	Average
			2004	Crawl space	Average
			2000	Crawl space	Average
			1996	Crawl space	Average
			1999	Crawl space	Average
			1993	Crawl space	Average

Exhibit 92. Repetitive Loss Area Field Survey Data (SNOQ 9).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A						
	A	X		X			
	A	X					
	A	X					
	A		X	X			
	?		X				
	A	X		X			
	A	X	X				
	H						
	H	X	X				
	A	X					
	A	X	X				
	L	X					
	H	X	X				
	A	X		X			
	L	X	X				
	A	X	X				
	A	X					
	A	X					
	A	X		X			
	A	X					
	L	X					
	A	X					

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

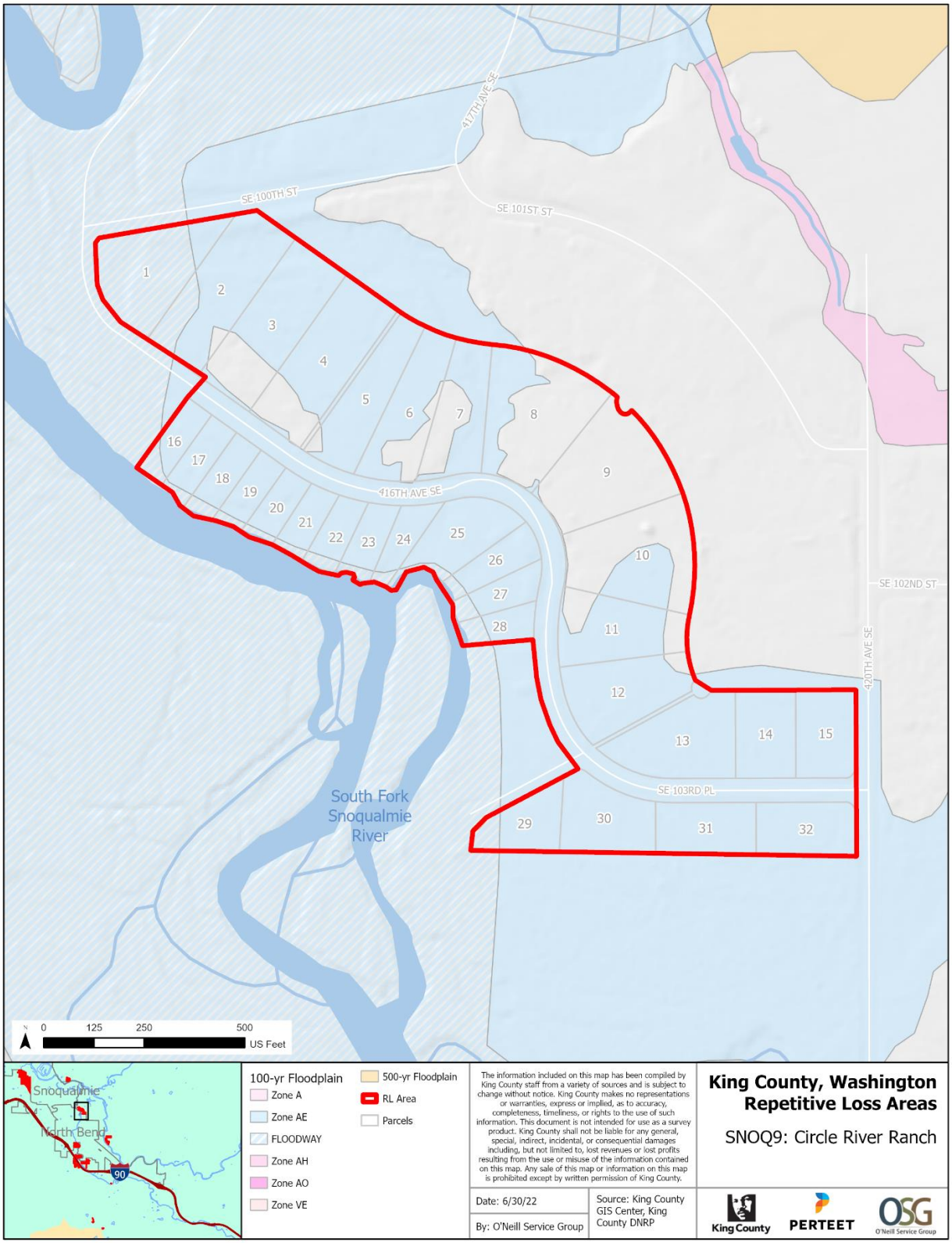


Exhibit 93. Circle River Ranch (SNOQ 9).

Flood Photos

South Fork Snoqualmie River at Circle River Ranch. January 9, 2009.

Example Properties

Repetitive Loss Area 10: Reinig Road (SNOQ 10)

This repetitive loss area is located on the right bank of the Snoqualmie River, just downstream of the confluence of the three forks. The area experiences flooding when the river overflows the banks.

Exhibit 94. Repetitive Loss Area Summary (SNOQ 10).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Reinig Road	1	0	1	3	1	5

Exhibit 95. Repetitive Loss Area Detailed Analysis (SNOQ 10).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1963	Unknown	Unknown
			1966	Basement	Average
			1970	Crawl space	Poor
				Vacant	Vacant
				Vacant	Vacant

Exhibit 96. Repetitive Loss Area Field Survey Data (SNOQ 10).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	L	X	X				
	H	X		X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

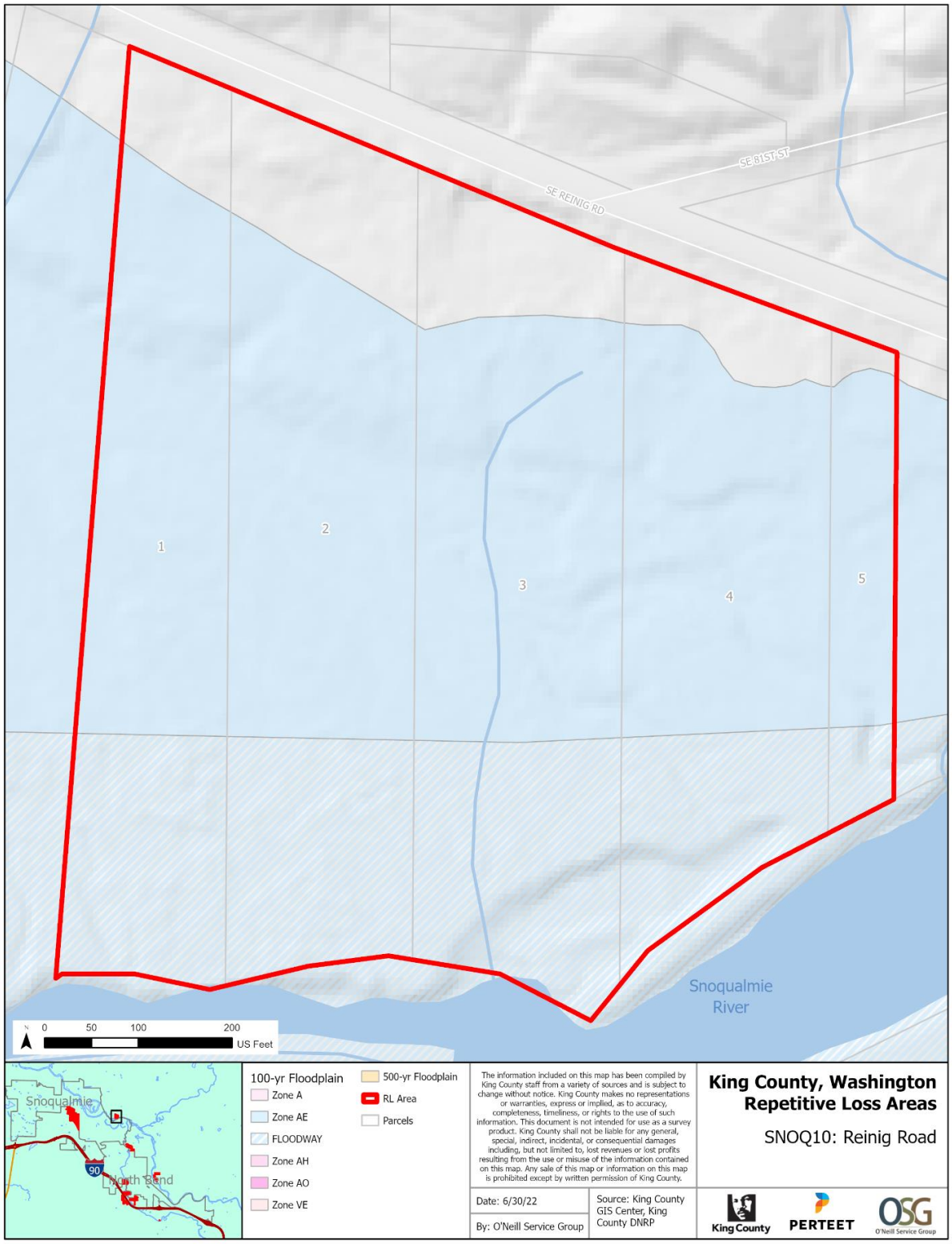


Exhibit 97. Reinig Road (SNOQ 10).

Example Properties

Repetitive Loss Area 11: Kimball Creek (SNOQ 11)

With almost 30% of the County's repetitive loss properties in this neighborhood, Kimball Creek has been a mitigation focus area for King County. Many of the homes in the neighborhood were constructed in the 1910s and 1920s. The area experiences flooding from several sources, including the Snoqualmie River to the east, Kimball Creek and Coal Creek which flow through the neighborhood, and several drainages with runoff that flows from the adjacent hillside.

In this area alone, 24 repetitive loss properties and 13 at risk properties have been mitigated, either through acquisition and demolition or by elevation, for a total of 37 mitigated properties.

Residents reported that:

- Flooding has increased since the construction of the Snoqualmie Ridge and the casino
- Flooding has become worse as more construction occurs on the ridge
- Raising the roadbeds would provide an evacuation route during flooding
- A drainage ditch flows in reverse during moderate to major flooding on the Snoqualmie River, bringing floodwater into the neighborhood. The landowners partially attribute this to capacity at the Snoqualmie Falls.

Exhibit 98. Repetitive Loss Area Summary (SNOQ 11).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Kimball Creek	16	24	11	96	70	144

Exhibit 99. Repetitive Loss Area Detailed Analysis (SNOQ 11).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1918	Basement	Average
			1917	Crawl space	Average
			1917	Slab on grade	Average
			1917	Crawl space	Poor
			1917	Crawl space	Average
			1939	Crawl space	Average
			2009	Garage	Good
			1935	Crawl space	Average
			1936	Crawl space	Average
			1931	Crawl space	Average
			1943	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
				Vacant	Vacant
			1943	Crawl space	Average
				Vacant	Vacant
			1965	Garage	Average
			1922	Piers	Average
			1924	Piers	Average
			1942	Piers	Average
			1930	Piers	Average
				Vacant	Vacant
			1937	Garage	Average
			1958	Garage	Good
			1950	Garage	Average
			1920	Crawl space	Average
				Vacant	Vacant
			1917	Garage	Fair
			1917	Piers	Average
			1917	Garage	Average
			1939	Crawl space	Poor
			1995	Garage	Average
			1935	Garage	Average
			1947	Crawl space	Average
			1917	Garage	Good
			1917	Garage	Good
			1917	Garage	Average
				Vacant	Vacant
				Vacant	Vacant
			1917	Garage	Average
			1925	Piers	Average
			1924	Unknown	Average
			1915	Crawl space	Good
			1930	Crawl space	Average
			1922	Crawl space	Average
			1924	Piers	Average
			1948	Crawl space	Average

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1977	Basement	Average
			1934	Garage	Average
			1917	Garage	Average
			1954	Slab on grade	Average
			1951	Garage	Good
			1917	Crawl space	Average
			1917	Garage	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Slab on grade	Average
			1917	Slab on grade	Average
			1984	Unknown	Average
			1967	Crawl space	Average
			1986	Garage	Average
			1919	Crawl space	Average
			1967	Crawl space	Average
			1939	Basement	Average
			1959	Slab on grade	Average
			1935	Crawl space	Average
			1969	Unknown	Average
			1977	Unknown	Average
			1964	Basement	Average
			1941	Unknown	Average
			1910	Garage	Average
			1944	Garage	Average
			1961	Crawl space	Average
			1957	Slab on grade	Average
			1927	Crawl space	Average
			1939	Crawl space	Average
			1934	Crawl space	Average
			1931	Crawl space	Average
			1996	Garage	Average
			1943	Crawl space	Average
			1947	Crawl space	Average
			1936	Slab on grade	Average
			1944	Basement	Average
			1948	Crawl space	Average
			1928	Piers	Average
			1973	Crawl space	Average
			1996	Split level	Average
			1920	Crawl space	Average
			1990	Unknown	Average
			1917	Slab on grade	Average
			1917	Unknown	Average

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1940	Slab on grade	Average
			1940	Crawl space	Average
			1917	Slab on grade	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Slab on grade	Average
			1922	Slab on grade	Average
			2004	Garage	Average
			1917	Garage	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Garage	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Garage	Average
			1904	Crawl space	Average
			1904	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Crawl space	Average
			1917	Garage	Average
			1905	Crawl space	Average
			1922	Crawl space	Average
			1917	Garage	Average
			1918	Crawl space	Average
			1922	Piers	Average
			1949	Crawl space	Average
			1926	Crawl space	Average
			1942	Unknown	Average
			1917	Slab on grade	Average
			1917	Unknown	Average
			1917	Crawl space	Average
			1926	Crawl space	Average
			1917	Piers	Average
			1943	Crawl space	Average
				Vacant	Vacant
			1938	Unknown	Average
			1934	Crawl space	Average
			2004	Crawl space	Good

Exhibit 100. Repetitive Loss Area Field Survey Data (SNOQ 11).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	H						
	L	X	X				
	A						
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	H						
	H						
	H						
	H						
	H						
	A						
	H						
	A						
	H						
	H	X	X				
	H						
	H						
	A						
	H				X		
	H						
	H						
	H	X	X				
	H						
	H						
	H						
	A						
	A						
	A						
	A						
	A	X	X				
	A	X	X				
	A	X			X		
	H						
	A						
	H						
	H						
	H		X				

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	L	X	X				
	H						
	A	X	X				
	A						
	A	X	X				
	A	X	X				
	A						
	A	X	X				
	A	X	X				
	A	X	X				
	L	X	X				
	A	X	X				
	A	X	X				
	A						
	H						
	H						
	A	X	X				
	A	X	X				
	A	X	X				
	L	X	X				
	A	X	X				
	A						
	A						
	A	X	X				
	A						
	H						
	H						
	A	X	X				
	H						
	A	X	X				
	A	X	X				
	L	X	X				
	A	X	X				
	H						
	A	X	X				
	H	X	X				
	A						
	A	X	X				
	L	X	X				
	H						
	A	X	X				
	H	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	L	X	X				

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	H						
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	L	X	X				
	H						
	H						
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	H						
	H	X	X				
	L	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				
	H						
	A	X	X				
	A	X	X				
	H						
	A	X	X				
	H						
	A	X	X				
	A	X	X				
	A	X	X				
	A	X					
	L	X	X				
	A	X	X				
	A	X	X				
	A						
	A	X	X				
	A	X	X				
	A	X	X				
	A	X	X				

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

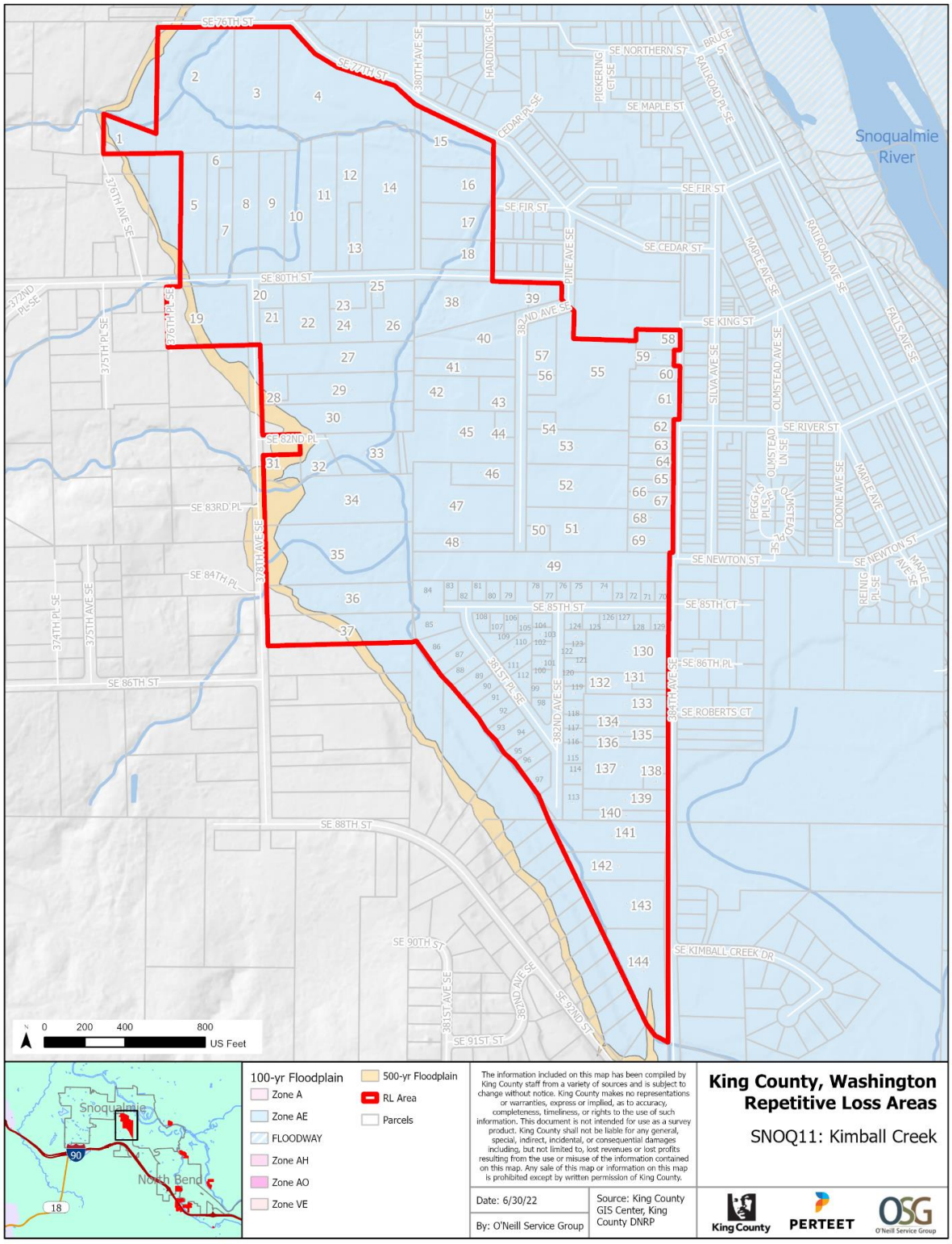


Exhibit 101. Kimball Creek (SNOQ 11).

Flood Photos

Snoqualmie River at Kimball Creek. January 7, 2009.

Snoqualmie River at Kimball Creek. November 6, 2006.

Example Properties

Repetitive Loss Area 12: Snoqualmie Falls (SNOQ 12)

The structure in this area is located on the riverbank and within the floodway. This is the first repetitive loss area downstream of the Snoqualmie Falls and within the area identified as the lower Snoqualmie Basin. The lower basin is characterized with a wide, expansive floodplain and floodway and land uses are primarily agricultural. The structure experiences overland flooding.

Exhibit 102. Repetitive Loss Area Summary (SNOQ 12).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Snoqualmie Falls	1	0	0	0	1	1

Exhibit 103. Repetitive Loss Area Detailed Analysis (SNOQ 12).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1964	Crawl space	Average

Exhibit 104. Repetitive Loss Area Field Survey Data (SNOQ 12).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X	X				

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

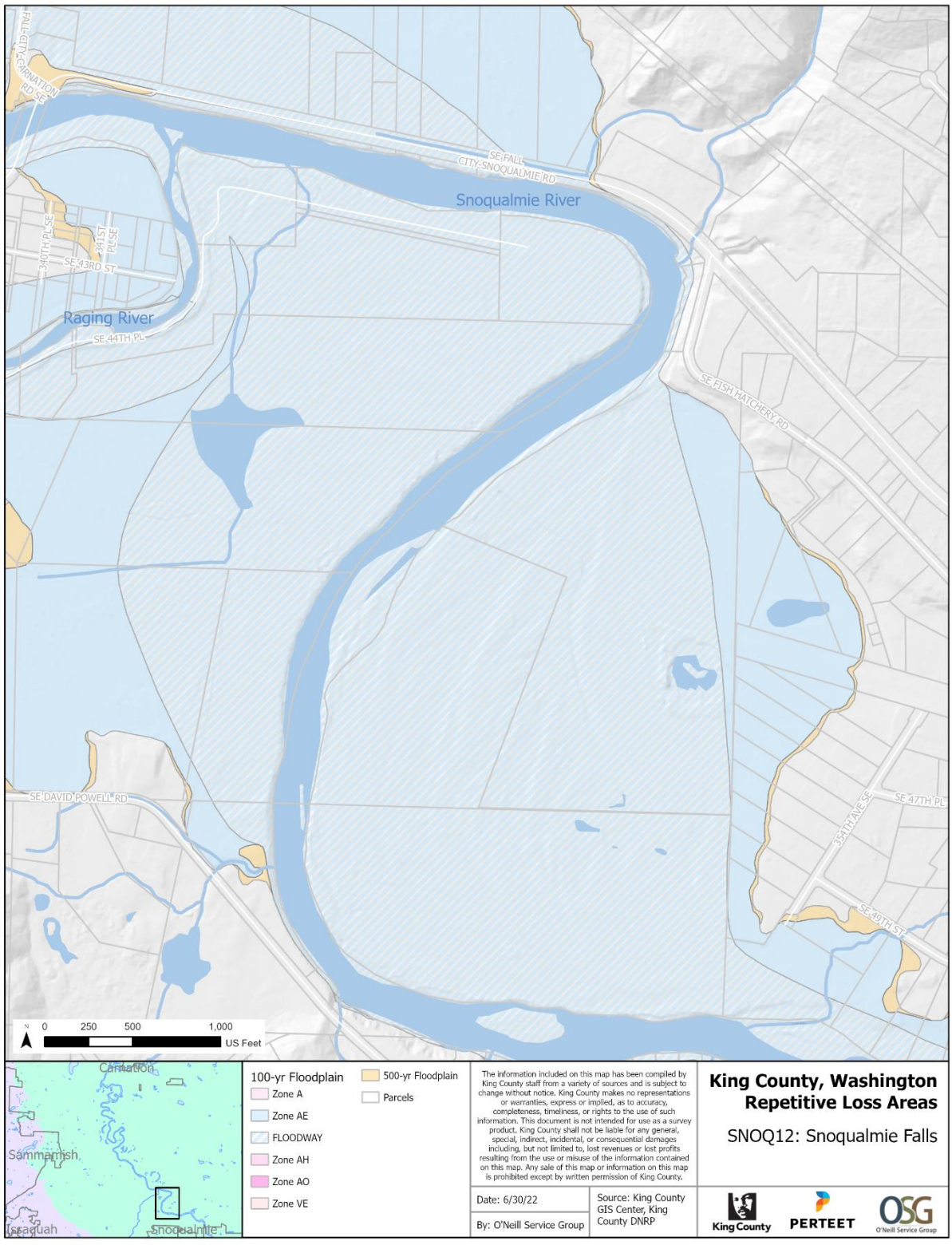


Exhibit 105. Snoqualmie Falls (SNOQ 12).

Repetitive Loss Area 13: Fall City 1 (SNOQ 13)

The Fall City 1 repetitive loss area is located on the right bank of the Snoqualmie River, near the Fall City bridge. This is the first repetitive loss area downstream of the Snoqualmie Falls and within the area identified as the lower Snoqualmie Basin. The lower basin is characterized with a wide, expansive floodplain and floodway and land uses are primarily agricultural. The properties within this repetitive loss area are all located within the floodway.

Exhibit 106. Repetitive Loss Area Summary (SNOQ 13).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Fall City 1	3	0	0	2	3	5

Exhibit 107. Repetitive Loss Area Detailed Analysis (SNOQ 13).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			Unknown	Unknown	Unknown
			1925	Garage	Average
				Vacant	Vacant
			1962	Crawl space	Average
			1966	Slab on grade	Average

Exhibit 108. Repetitive Loss Area Field Survey Data (SNOQ 13).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A		X				
	A		X				
	A		X		X		
	A	X					

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

Exhibit 109. Fall City 1 (SNOQ 13).

Flood Photos

Snoqualmie River at Fall City 1. January 5, 2015.

Snoqualmie River at Fall City 1. November 24, 1990.

Example Properties

Repetitive Loss Areas 14, 15, and 16: Fall City 2 (SNOQ 14), Snoqualmie River (SNOQ 15), and Blue Heron (SNOQ 16)

The properties within these repetitive loss areas are agricultural properties located along the left bank and within the floodway of the Snoqualmie River. They experience overbank flooding that inundates the entire area with up to several feet of flood water.

Exhibit 110. Repetitive Loss Area Summary (SNOQ 14, 15, and 16).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Fall City 2	2	0	0	2	2	4
Snoqualmie River	2	2	1	0	3	8
Blue Heron	3	1	1	1	4	6

Exhibit 111. Repetitive Loss Area Detailed Analysis (SNOQ 14, 15, and 16).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.				Vacant	Vacant
			Unknown	Unknown	Unknown
			1928	Piers	Average
			1935	Unknown	Average
			1909	Crawl space	Average
				Vacant	Vacant
			1951	Crawl space	Average
			1943	Crawl space	Poor
			Unknown	Unknown	Unknown
			Unknown	Unknown	Poor
			1969	Garage	Good
			1919	Piers	Average
			1924	Crawl space	Poor
			2000	Crawl space	Average

Exhibit 112. Repetitive Loss Area Field Survey Data (SNOQ 14, 15, and 16).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X					
	A	X					
	A	X	X				
	H			X			
	A	X					
	A				X		
	A		X				
	A	X					
	A	X					
	A	X					
	H			X			
	H			X			
	H			X			
	H			X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

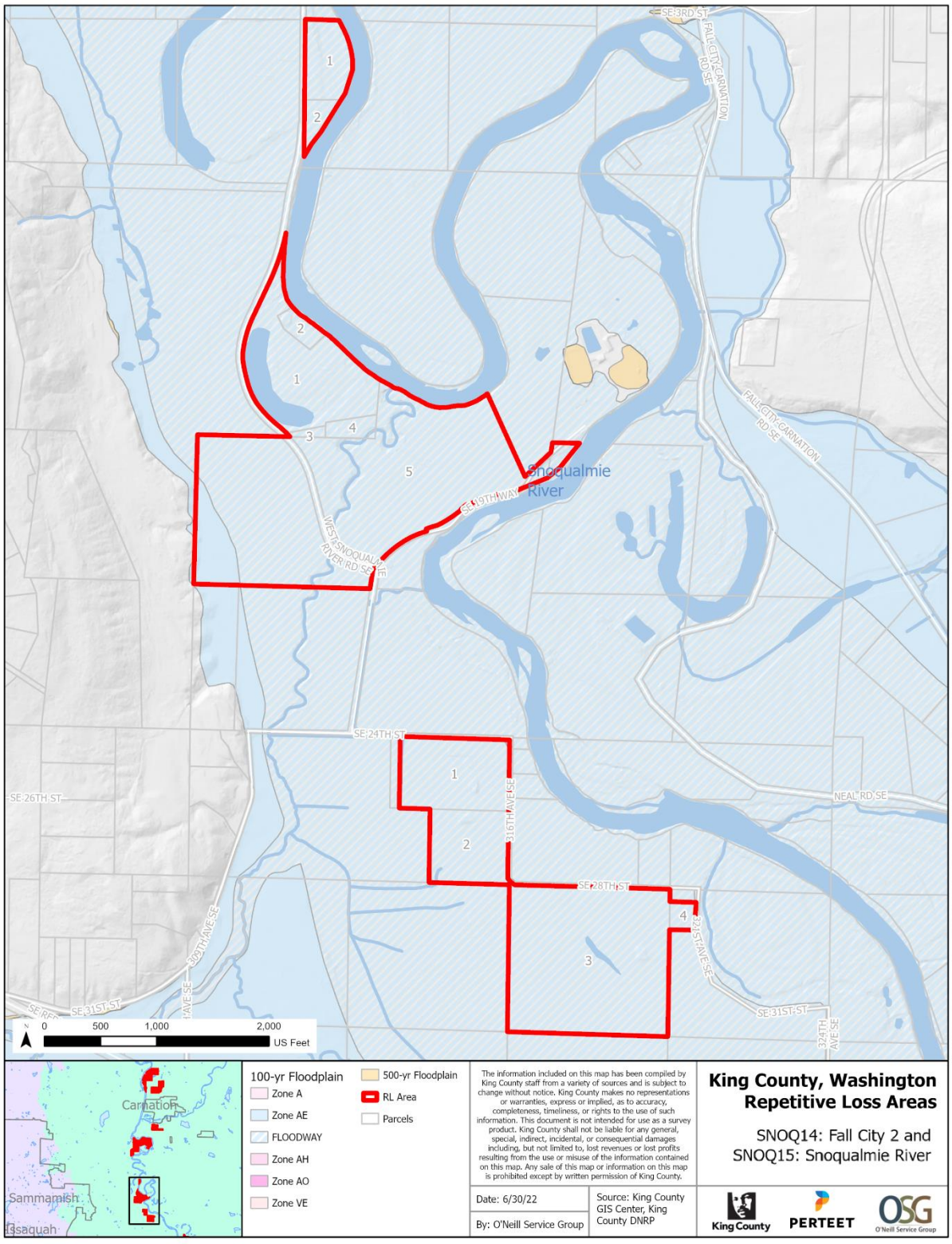


Exhibit 113. Fall City 2 and Snoqualmie River (SNOQ 14 and 15).

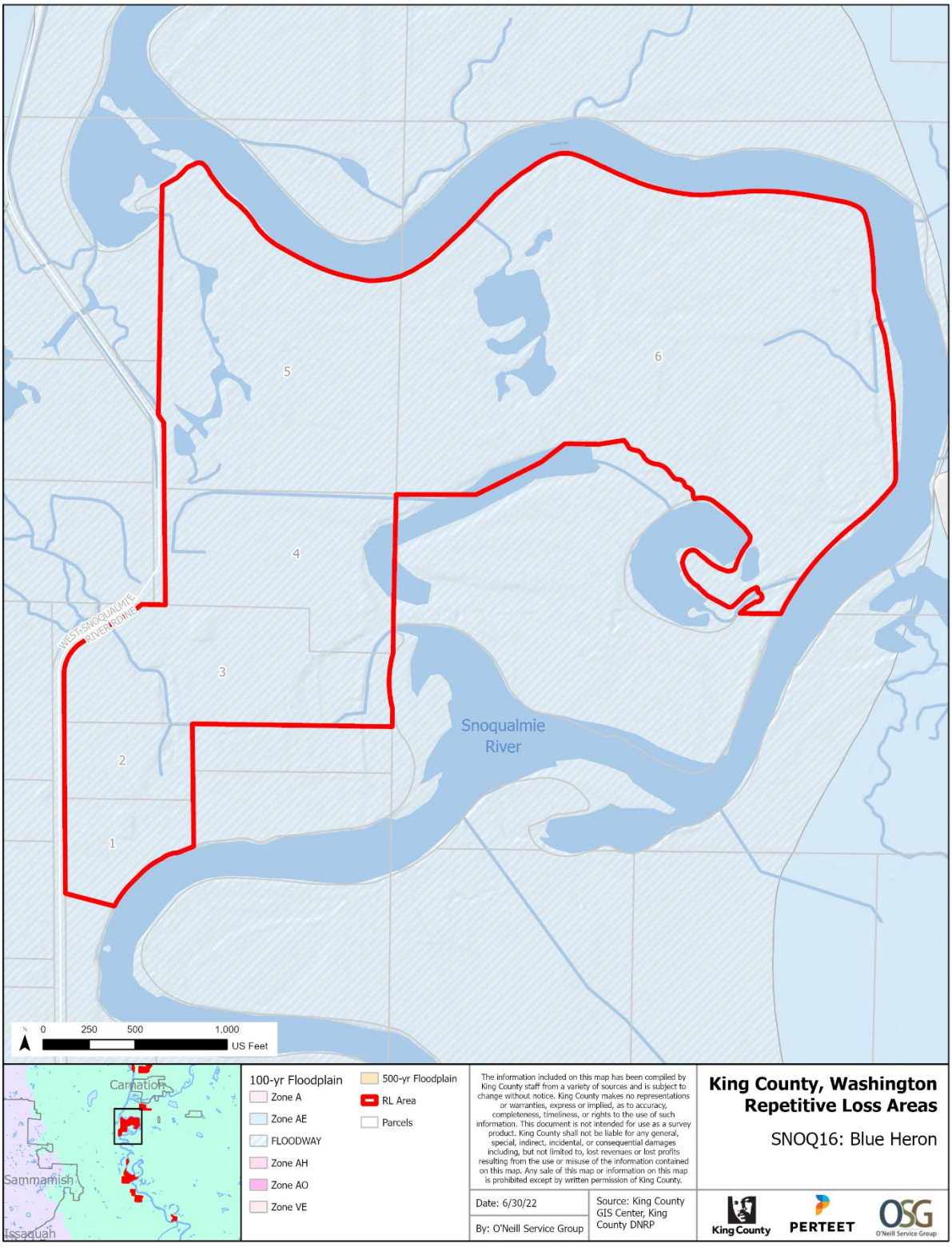


Exhibit 114. Blue Heron (SNOQ 16).

Flood Photos

Snoqualmie River at Fall City 2. January 7, 2009.

Snoqualmie River at Fall City 2. January 7, 2009.

Snoqualmie River at Snoqualmie River. January 5, 2015.

Snoqualmie River at Snoqualmie River. February 8, 1996.

Snoqualmie River at Blue Heron. January 5, 2015.

Snoqualmie River at Blue Heron. November 23, 1986.

Example Properties






Repetitive Loss Area 17: Fall City Carnation Road (SNOQ 17)

This repetitive loss area is the only area along the Tolt River, but the flooding is primarily associated with the Snoqualmie River. When the Snoqualmie River is high, this area experiences backwater flooding from the creeks and river flowing into the Snoqualmie River, as well as overland flooding from the Snoqualmie.

Exhibit 115. Repetitive Loss Area Summary (SNOQ 17).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Fall City Carnation Road	1	1	0	3	3	5

Exhibit 116. Repetitive Loss Area Detailed Analysis (SNOQ 17).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1948	Crawl space	Average
			1920	Basement	Average
			1961	Crawl space	Average
			1948	Crawl space	Average
			1915	Crawl space	Average

Exhibit 117. Repetitive Loss Area Field Survey Data (SNOQ 17).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X	X				
	H						
	A	X	X				
	A	X	X				
	A	X	X				

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

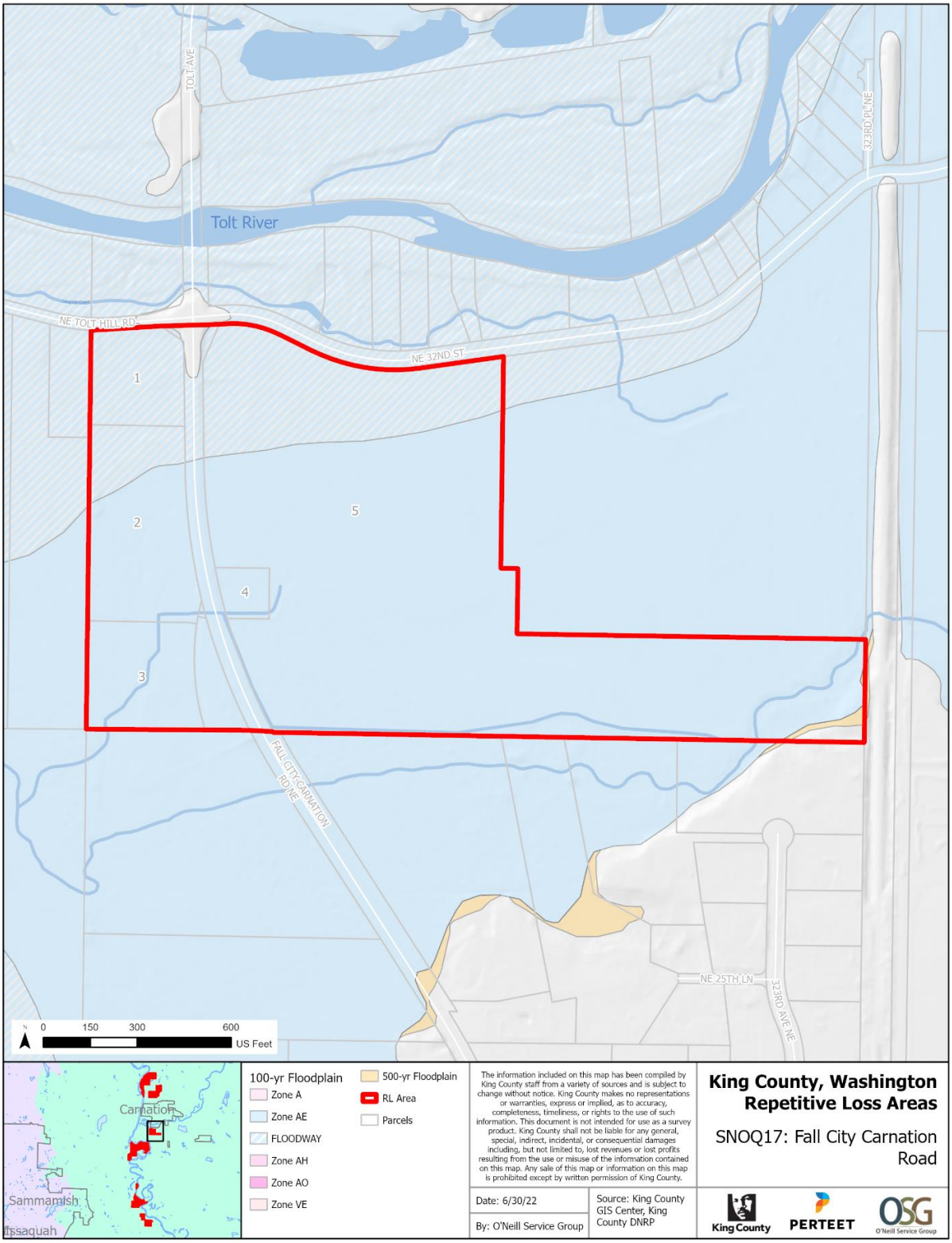


Exhibit 118. Fall City Carnation Road (SNOQ 17).

Flood Photos

Snoqualmie River at Fall City Carnation Road. November 6, 2006.

Example Properties

Repetitive Loss Area 18: North of Carnation (SNOQ 18)

This suburban neighborhood, within an Urban Growth Area north of the City of Carnation, is at the edge of the floodplain along the Snoqualmie River. This area is primarily within the 100-year floodplain, with some properties in the floodway. The neighborhood is a mixture of older and newer homes. The area experiences overland flooding. Several properties in this area have already been mitigated.

Exhibit 119. Repetitive Loss Area Summary (SNOQ 18).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
North of Carnation	8	2	10	51	19	71

Exhibit 120. Repetitive Loss Area Detailed Analysis (SNOQ 18).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1960	Crawl space	Average
			1923	Basement	Average
			1958	Slab on grade	Average
			1920	Crawl space	Average
			1997	Crawl space	Average
			2000	Crawl space	Average
			1997	Crawl space	Average
			1925	Crawl space	Average
			1920	Piers	Average
			1997	Crawl space	Average
				Vacant	Vacant
			1998	Crawl space	Average
			1998	Crawl space	Average
			1998	Crawl space	Average
			1998	Crawl space	Average
			1998	Crawl space	Average
			1915	Piers	Average
			1961	Crawl space	Average
			1914	Piers	Poor
			1958	Slab on grade	Average
			1914	Crawl space	Average
			2000	Slab on grade	Average
			2000	Slab on grade	Average
			1986	Slab on grade	Average
			1965	Crawl space	Poor
			1950	Crawl space	Average
			1983	Slab on grade	Average
			1952	Crawl space	Average
			1916	Crawl space	Average
			1992	Crawl space	Average
			1970	Crawl space	Average

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			2008	Crawl space	Average
			2006	Crawl space	Average
			1980	Crawl space	Average
			2006	Crawl space	Good
			1967	Crawl space	Poor
			1912	Unknown	Average
			1920	Crawl space	Average
			1915	Crawl space	Poor
			2006	Crawl space	Average
			1965	Crawl space	Average
			1913	Piers	Good
			1980	Crawl space	Poor
			1912	Crawl space	Average
			1921	Crawl space	Average
			1912	Crawl space	Average
			1967	Crawl space	Average
			1915	Crawl space	Average
			1971	Crawl space	Good
			1913	Crawl space	Average
			1913	Crawl space	Average

Exhibit 121. Repetitive Loss Area Field Survey Data (SNOQ 18).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X					
	H						
	A	X					
	A	X					
	H	X					
	H	X					
	H	X					
	H	X					
	A						
	H						
	H	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	H						
	H	X					
	H	X					
	A	X					
	A	X					

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	H	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A						
	A	X					
	A	X					
	H						
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	A	X					
	H	X		X			
	A	X					
	A	X					

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

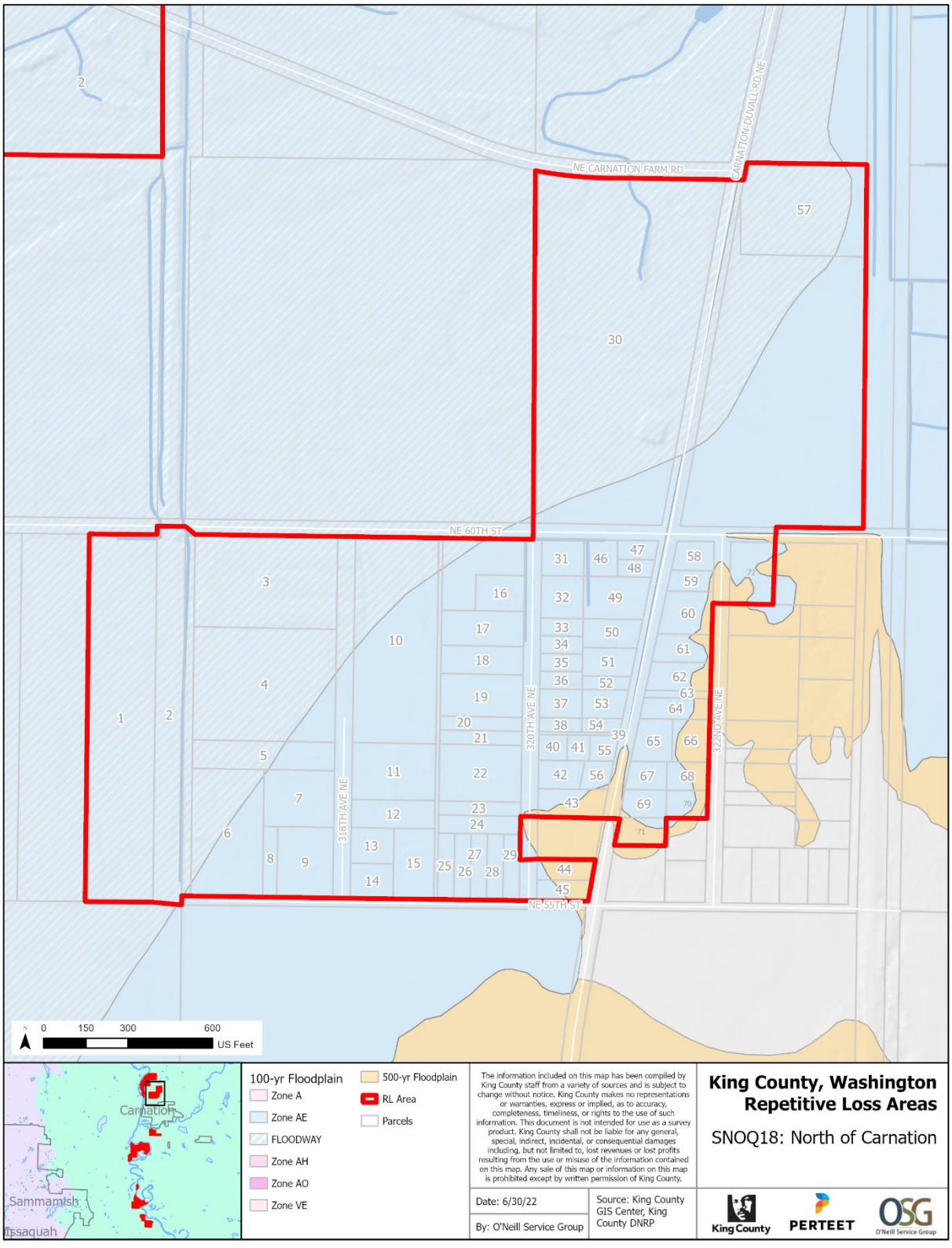


Exhibit 122. North of Carnation (SNOQ 18).

Flood Photos

Snoqualmie River at North of Carnation. November 6, 2006.

Snoqualmie River at North of Carnation. January 8, 1986.

Example Properties

Repetitive Loss Area 19: Carnation Farm (SNOQ 19)

The Carnation Farm area is located on the right bank of the Snoqualmie River and are within the floodway. The properties are agricultural properties with farm homes and they experience overland flooding.

Residents reported that there needs to be better management of the Tolt River (which converges with the Snoqualmie River upstream of this area) and more capacity at the Carnation Farm Road bridge crossing of the Snoqualmie River.

Exhibit 123. Repetitive Loss Area Summary (SNOQ 19).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Carnation Farm	2	0	0	2	2	4

Exhibit 124. Repetitive Loss Area Detailed Analysis (SNOQ 19).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1918	Unknown	Average
			1918	Piers	Average
			1920	Crawl space	Average
				Vacant	Vacant

Exhibit 125. Repetitive Loss Area Field Survey Data (SNOQ 19).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	H	X					
	A	X					
	A	X					

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

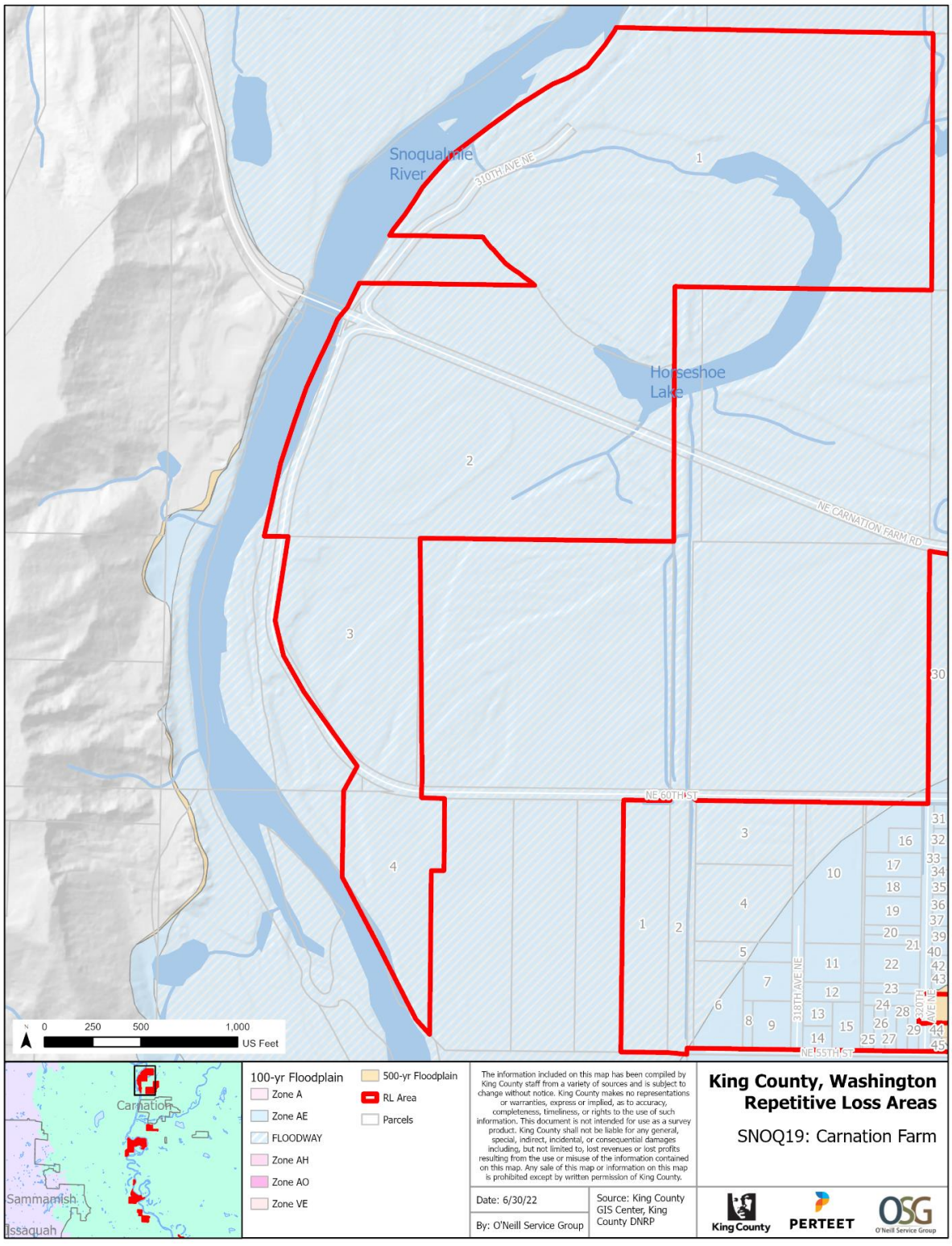


Exhibit 126. Carnation Farm (SNOQ 19).

Flood Photos

Snoqualmie River at Carnation Farm. January 7, 2009.

Snoqualmie River at Carnation Farm. February 8, 1996.

Example Properties

Repetitive Loss Area 20: Carnation Ranch (SNOQ 20)

In accordance with the Privacy Act of 1974, information about individual repetitive loss properties will not be shared with the general public.

The Carnation Ranch property is located on the left bank of the Snoqualmie River within the floodway and experiences overland flooding.

Exhibit 127. Repetitive Loss Area Summary (SNOQ 20).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Carnation Ranch	1	0	0	0	1	1

Exhibit 128. Repetitive Loss Area Detailed Analysis (SNOQ 20).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1972	Crawl space	Average

Exhibit 129. Repetitive Loss Area Field Survey Data (SNOQ 20).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X					

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

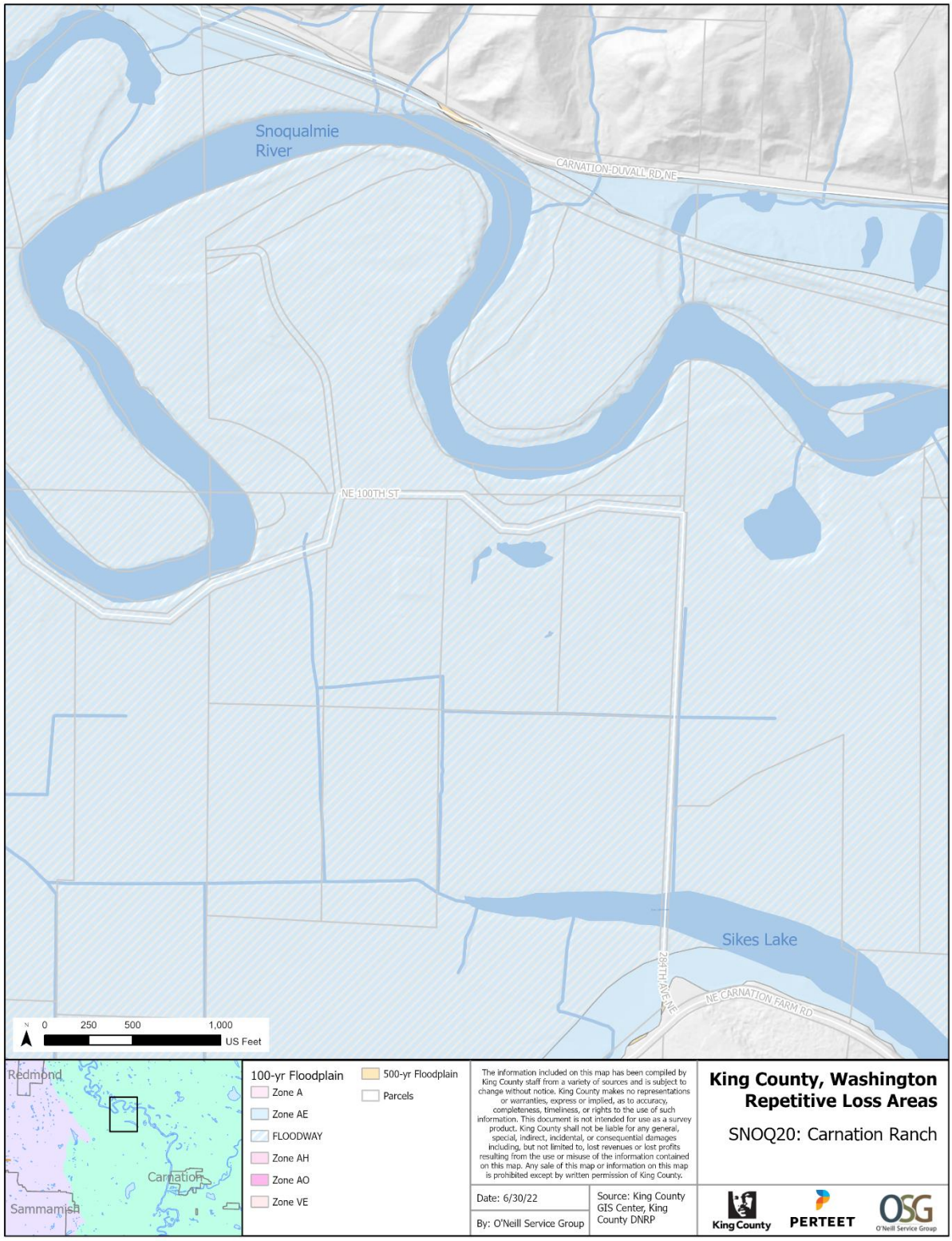


Exhibit 130. Carnation Ranch (SNOQ 20).

Repetitive Loss Area 21: Cherry Valley (SNOQ 21)

Cherry Creek is a tributary to the Snoqualmie River. The properties in this repetitive loss area are agricultural with farm homes constructed in the 1970s. The properties are located in a flat area where floodwaters can collect before entering a more constrained channel.

Residents reported that there is too much sediment in the creek which inhibits the flow and causes flooding.

Exhibit 131. Repetitive Loss Area Summary (SNOQ 21).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Cherry Valley	1	0	0	2	2	3

Exhibit 132. Repetitive Loss Area Detailed Analysis (SNOQ 21).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1978	Basement	Average
			1977	Unknown	Average
			1979	Slab on grade	Good

Exhibit 133. Repetitive Loss Area Field Survey Data (SNOQ 21).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X					
	A						
	H						

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

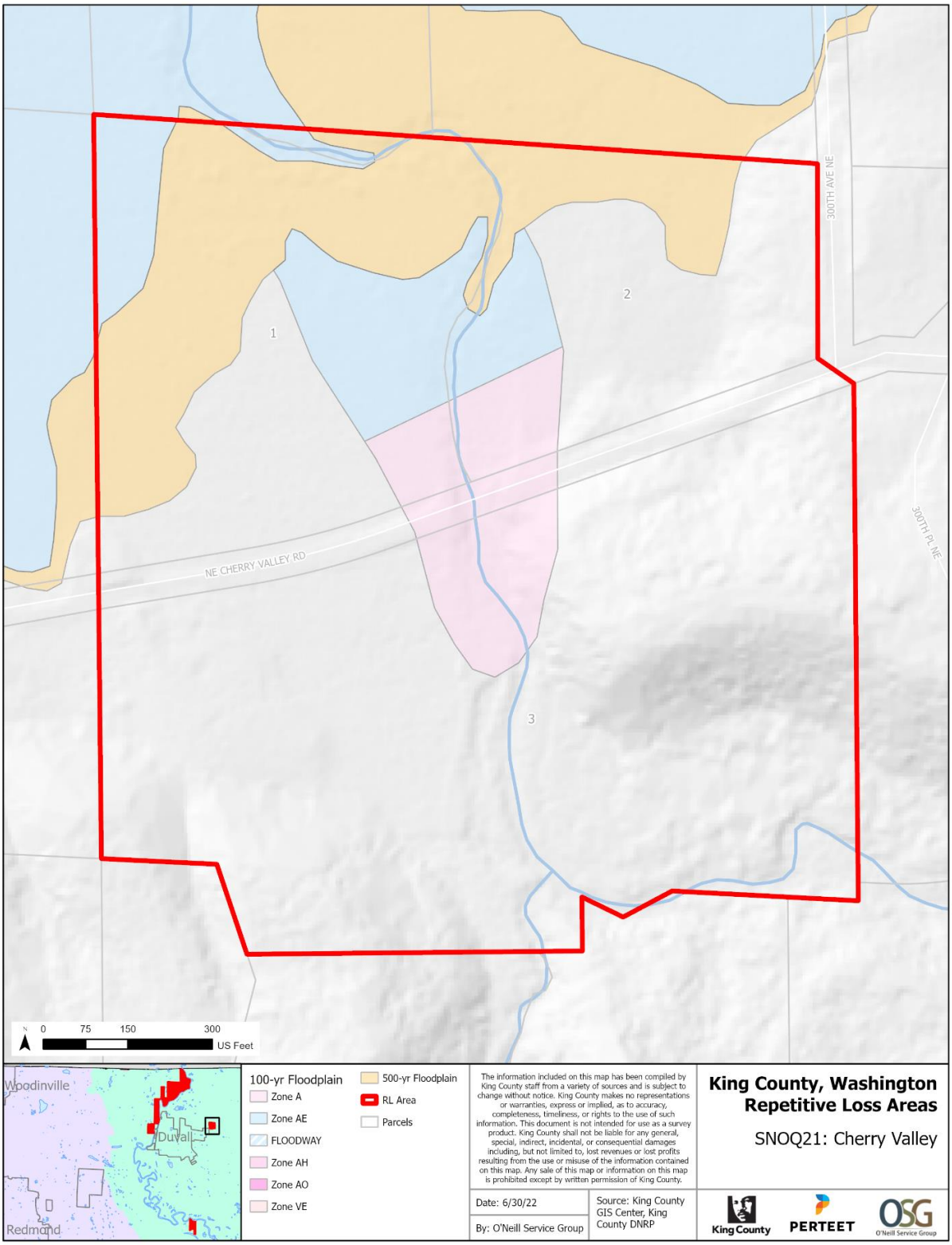


Exhibit 134. Cherry Valley (SNOQ 21).

Flood Photos

Snoqualmie River at Cherry Valley. February 8, 1996.

Example Properties

Repetitive Loss Area 22: Duvall (SNOQ 22)

The properties within this repetitive loss area are agricultural properties located along the left bank and within the floodway of the Snoqualmie River. They experience overbank flooding that inundates the entire area with several feet of flood water. Flood depths in this area are influenced by backwater conditions imposed by the Skykomish River at their confluence approximately six miles downstream.

Residents reported that the County does not understand flooding in this area.

Exhibit 135. Repetitive Loss Area Summary (SNOQ 22).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Duvall	9	1	2	11	18	22

Exhibit 136. Repetitive Loss Area Detailed Analysis (SNOQ 22).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1929	Crawl space	Average
			1973	Split level	Average
			1935	Crawl space	Poor
			1913	Crawl space	Average
			Unknown	Slab on grade	Average
			1944	Piers	Average
			Unknown	Crawl space	Average
			1900	Crawl space	Average
			1914	Crawl space	Average
			1963	Piers	Average
			Unknown	Unknown	Unknown
			1969	Unknown	Good
			1940	Slab on grade	Average
			1933	Crawl space	Average
			1965	Piers	Average
			1944	Piers	Average
			1970	Piers	Average
			1916	Crawl space	Average

Exhibit 137. Repetitive Loss Area Field Survey Data (SNOQ 22).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A	X					
	A	X					
	A	X	X				
	A	X					
	A	X					
	H	X					
	H	X					
	A	X					
	A	X					
	A	X	X				
	H						
	A	X					
	A	X					
	A	X					
	A	X					
	H						
	H						
	H						
	A	X	X				

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

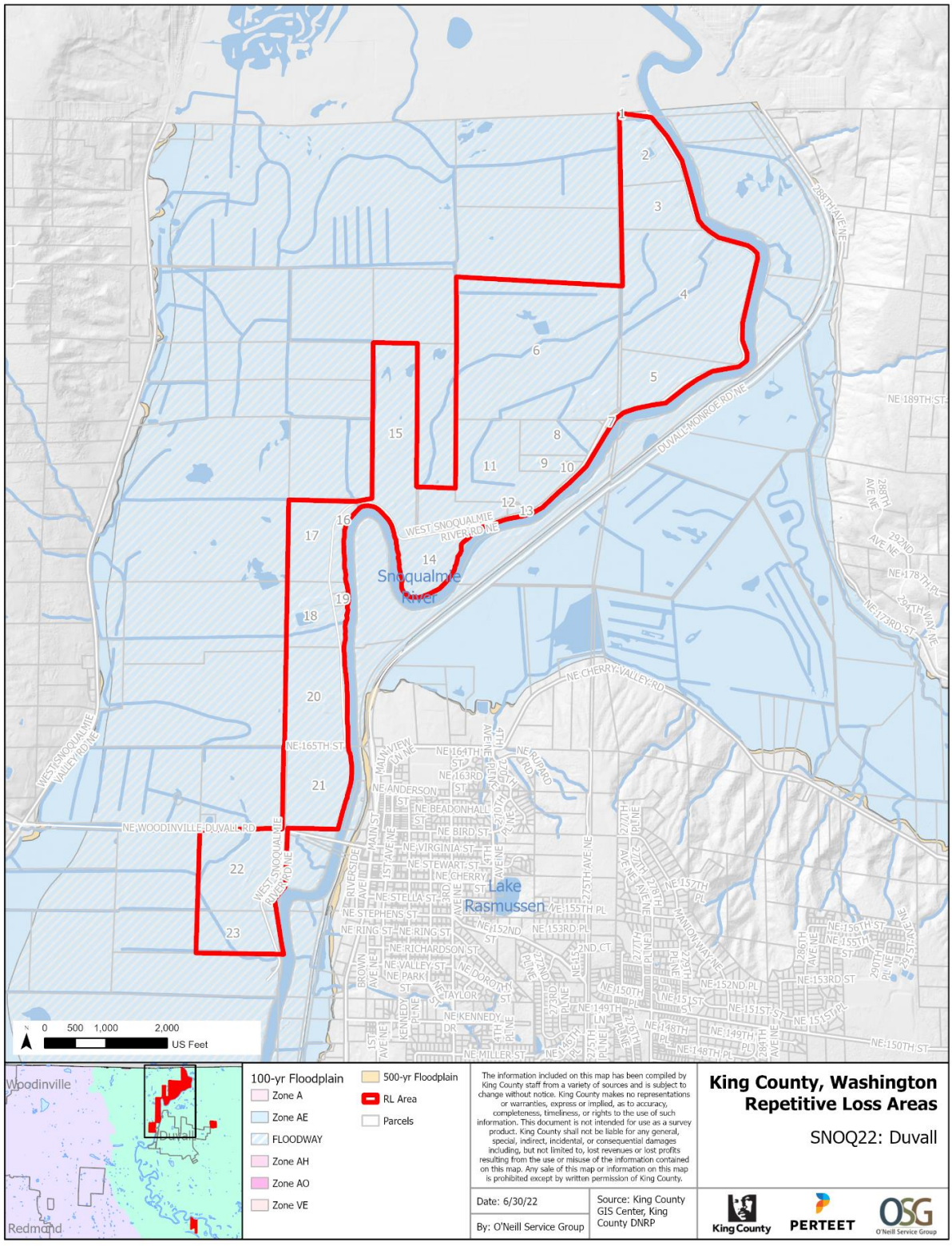


Exhibit 138. Duvall (SNOQ 22).

Flood Photos

Snoqualmie River at Duvall. November 6, 2006.

Snoqualmie River at Duvall. November 6, 2006.

Example Properties

BASIN 5 – VASHON ISLAND

Vashon Island is located in Puget Sound. The island is 36.9 square miles in size and is developed at a variety of densities, from large tracts formerly used for agriculture, to small, narrow lots along the waterfront. The floodplain is primarily VE zone along the shoreline, with A zones associated with some of the small creeks that drain into Puget Sound. There are two repetitive loss areas, three repetitive loss properties, and 31 properties with similar risk.

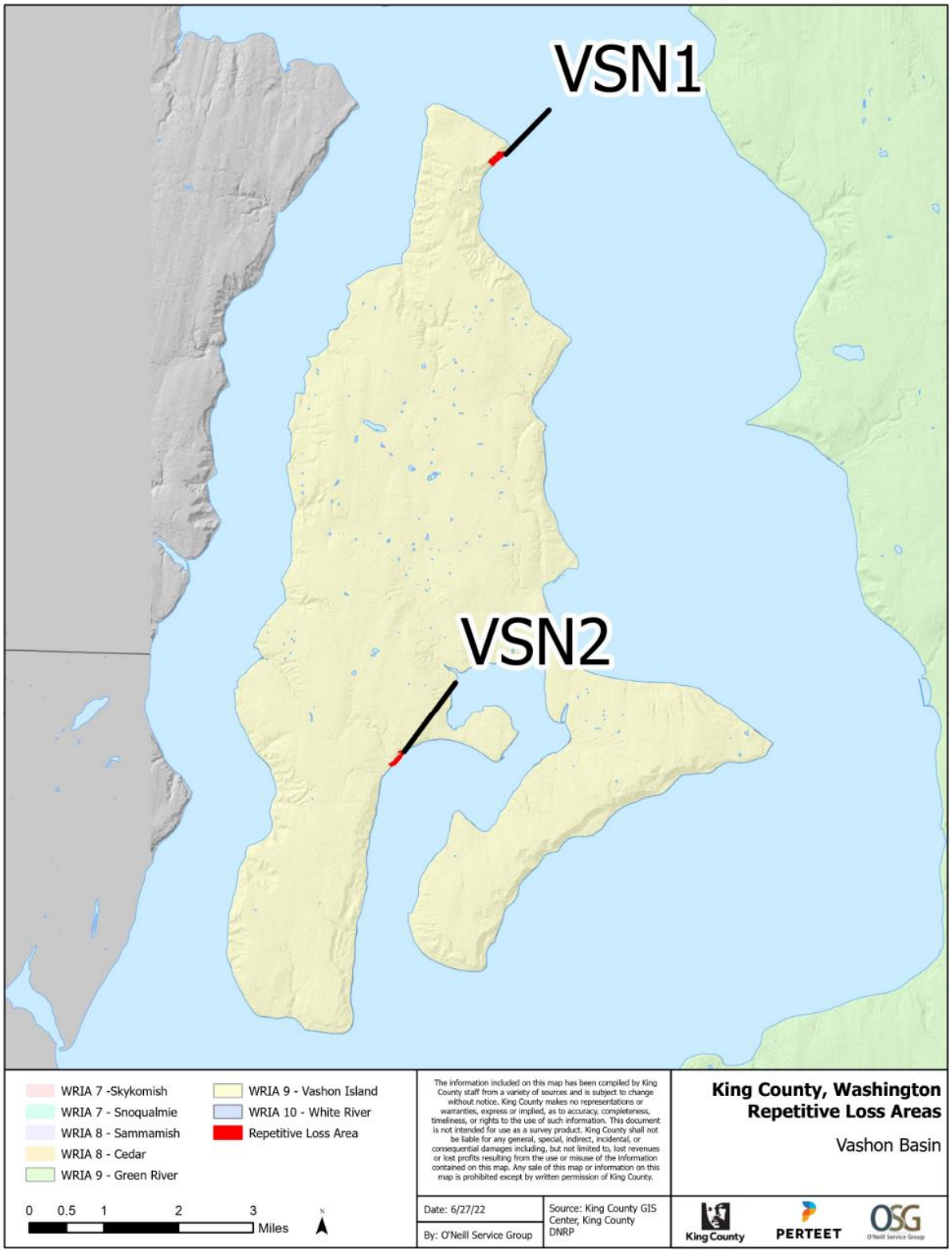


Exhibit 139. Vashon Island.

Repetitive Loss Area 1: Dolphin Point (VI 1)

Dolphin Point is located at the most northeastern point on the island. The properties within the repetitive loss area are located on a narrow shoreline backed by a steep hillside. In addition to flood risk, these properties are also at risk from mudslides or landslides. The properties at greatest risk of flooding are those constructed at the edge of the beach. Many properties have constructed bulkheads to reduce flooding risk.

Residents reported that landslides are a bigger problem than flooding.

Exhibit 140. Repetitive Loss Area Summary (VI 1).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Dolphin Point	2	0	1	11	3	14

Exhibit 141. Repetitive Loss Area Detailed Analysis (VI 1).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1922	Unknown	Average
			1960	Slab on grade	Average
			1918	Slab on grade	Average
			1977	Piers	Average
			1928	Crawl space	Average
			1963	Crawl space	Average
			1983	Slab on grade	Average
			1997	Slab on grade	Average
			1920	Basement	Average
			1963	Crawl space	Average
			1968	Garage	Average
			1959	Slab on grade	Average
			1924	Slab on grade	Average

Exhibit 142. Repetitive Loss Area Field Survey Data (VI 1).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	L	X		X			
	L	X		X			
	A	X		X			
	H			X			
	A	X		X			
	A	X		X			
	A	X		X			
	A	X		X			
	H			X			
	A	X		X			
	A	X		X			
	A	X		X			
	A	X		X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

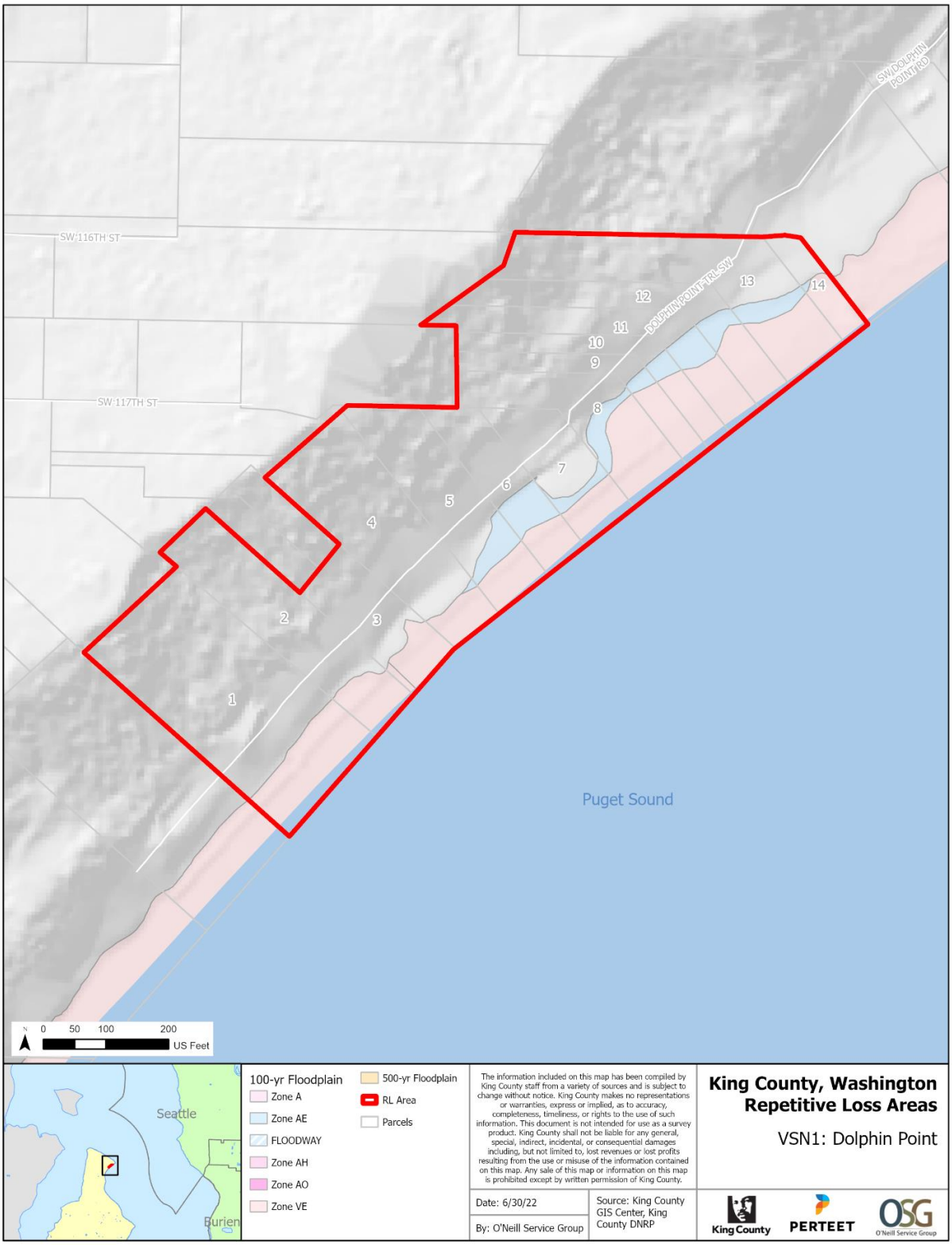


Exhibit 143. Dolphin Point (VI 1).

Example Properties

Repetitive Loss Area 2: Shawnee (VI 2)

The Shawnee neighborhood is located on the east side of Vashon Island, to the west of Maury Island. The neighborhood is located on an alluvial fan created by Fisher Creek. The residences are generally in the costal AE zone, with some constructed at the boundary of the VE zone. At low tide, the beach extends for hundreds of feet. The properties at greatest risk are those located on lower ground closest to the beach. Most of the homes were constructed in the 1940s to 1960s.

Exhibit 144. Repetitive Loss Area Summary (VI 2).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Shawnee	1	0	3	13	1	17

Exhibit 145. Repetitive Loss Area Detailed Analysis (VI 2).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1968	Unknown	Average
			1943	Slab on grade	Average
			1947	Crawl space	Average
			1943	Crawl space	Average
			1932	Unknown	Average
			1967	Garage	Average
			1951	Crawl space	Average
			1952	Unknown	Average
			1946	Unknown	Average
			1964	Unknown	Average
			1955	Slab on grade	Average
			1946	Slab on grade	Average
			1979	Unknown	Average
			1979	Unknown	Average

Exhibit 146. Repetitive Loss Area Field Survey Data (VI 2).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A			X			
	A			X			
	A	X		X			
	A			X			
	A			X			
	A			X			
	L			X			
	L			X			
	L			X			
	L			X			
	A			X			
	A			X			
	A			X			
	A			X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

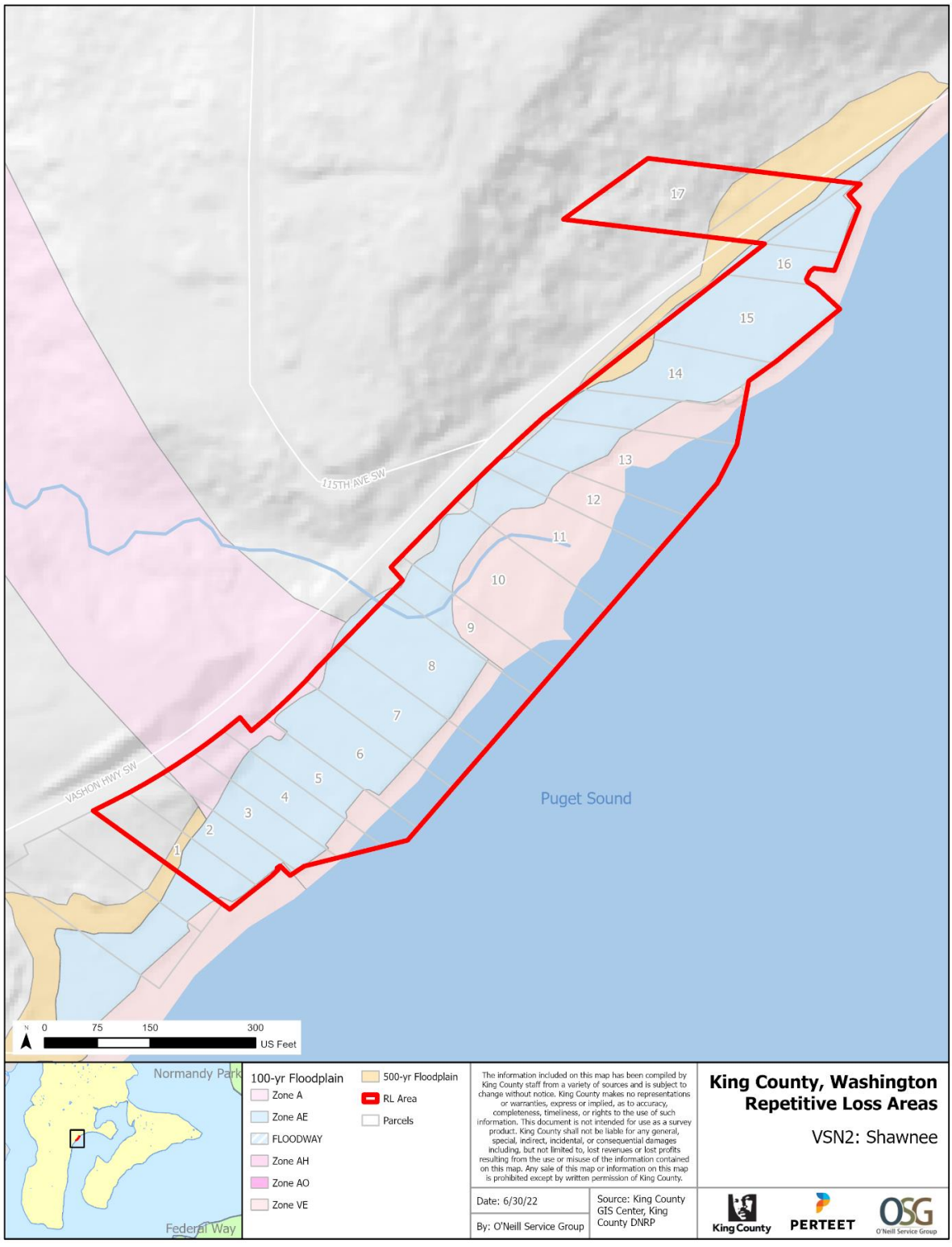


Exhibit 147. Shawnee (VI 2).

Example Properties




BASIN 6 – GREEN RIVER

The Green River Basin has 5 repetitive loss areas, 5 unmitigated properties, no mitigated properties, and 21 total properties.

Major flood control features along the Green River include Howard A. Hanson Dam, which is in the upper Green River sub-watershed, and the levee system that lines almost all riverbanks of the lower Green and Duwamish Rivers. Howard A. Hanson Dam and the levee system combine to reduce flooding in the lower river to a fraction of its historical magnitudes.

With major historical flooding largely controlled by a dam and levees, commercial and industrial land use in the largely flat and generally accessible lower Green and Duwamish River valleys has proliferated in what were formerly rural and agricultural communities. Agriculture endures in some parts of the lower Green River around the cities of Auburn and Kent, and agriculture and rural residential development are the primary land uses in the middle Green River.

Residents, businesses, and farms below the Howard A. Hanson Dam in the Green River Valley prepared for a higher risk of flooding due to damage that occurred to an earthen bank next to the dam after record high water in January 2009. While temporary improvements made by the US Army Corps of Engineers successfully lowered the risk of flooding in the Green River Valley, the dam continued to operate at a limited capacity during the 2010/2011 flood season, creating a heightened risk of flooding in the lower valley.

In March 2011, the US Army Corps of Engineers announced the return of full operational capacity at Howard A. Hanson Dam. However, this functioning dam and levee system does not eliminate all risks of flooding. The dam was formerly thought to control water up to a 500-year flood event. Now, the US Army Corps of Engineers recognizes the dam capacity can control water up to a 140-year flood event.

The King County Flood Control District is currently in the process of developing a Lower Green River Corridor Flood Hazard Management Plan for approximately 21 river miles of the Lower Green River. The goal of the Plan is to provide a long-term approach to reduce flood risk and improve fish habitat while supporting the economic prosperity of the region. The Flood Control District is also preparing a Programmatic Environmental Impact Statement (PEIS), which will analyze alternatives for flood protection that could be included in the Plan.

Current investments in the Green River Basin include:

Black River Pump Station Improvements
This project makes a number of improvements to the Black River Pump Station to ensure that the station continues to provide flood risk reduction benefits to this economically vibrant area. Improvements will also ensure the operation is safe, reliable, efficient, and avoids or minimizes impacts to the environment. Improvements include: seismic and structural, fish passage, mechanical renovations, and high-use engine replacement.

Galli's-Dykstra Levee Repair Project
This project completes a Phase 1 repair per a request from the City of Auburn by elevating a 3500-feet long levee reach to meet FEMA levee certification requirements.

Green River System-Wide Improvement Framework
The Green River System-Wide Improvement Framework outlines a prioritized strategy to address levee deficiencies in order to optimize flood risk reduction, address system-wide issues and maintain eligibility for the 17 miles of levees currently enrolled in the Corps of Engineers Levee Rehabilitation and Inspection Program under Public Law 84-99.

Lower Russell Levee Setback Project
This project will remove and replace the existing flood containment system of levee and revetments along the right (east) bank of the Green River between river mile 17.85 (S 212th Street) and river mile 19.25 (S 228th Street/Veterans Drive) in the City of Kent in order to construct a flood prevention system that balances policy directives regarding flood risk reduction, habitat restoration, and recreational use.

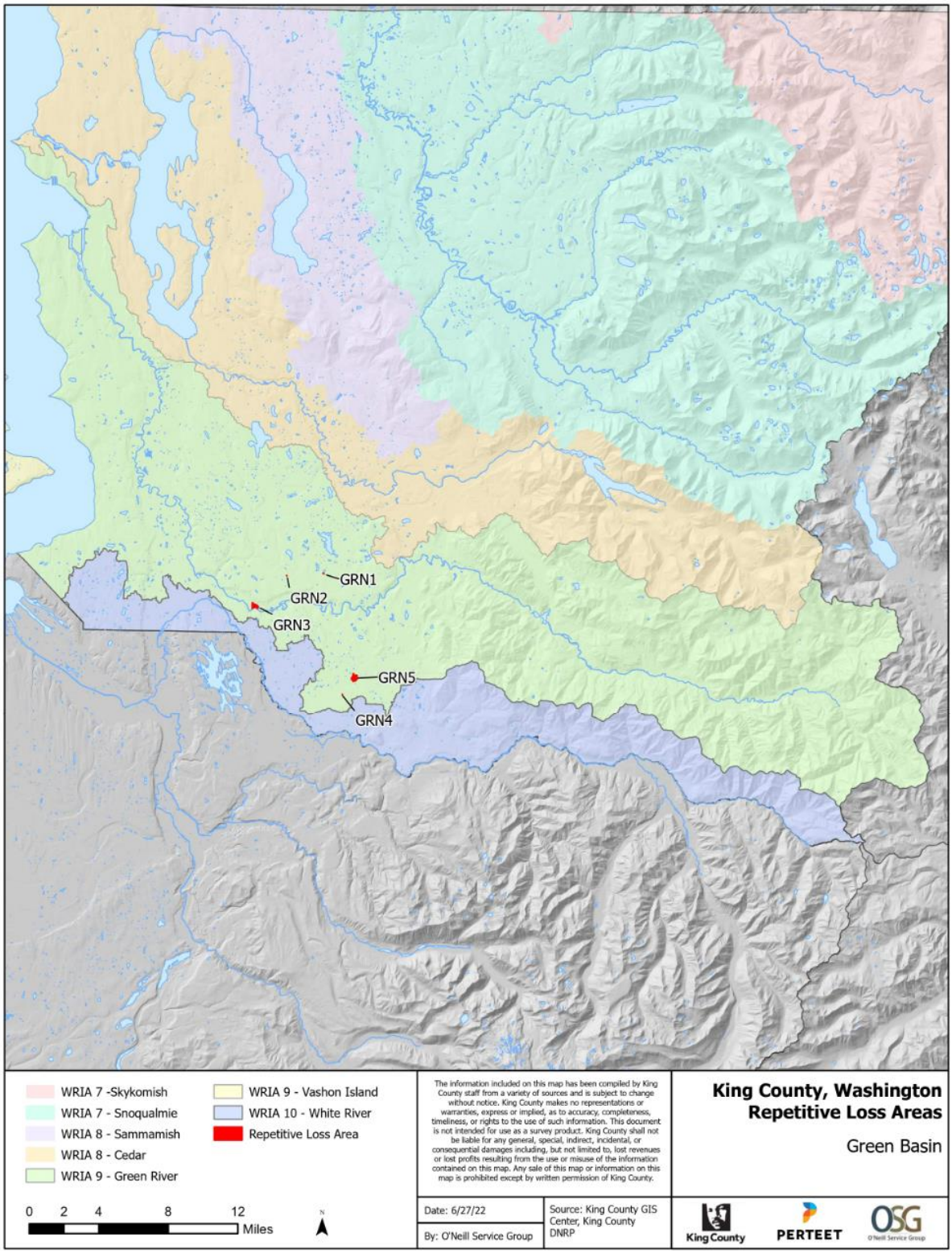


Exhibit 148. Green River Basin.

Repetitive Loss Area 1: Horseshoe Lake (GRN 1)

Horseshoe Lake is a small, closed lake just outside the City of Black Diamond that does not have a regulatory floodplain. About 75% of the lake is surrounded by homes. The remaining portion is a wetland that is inundated when the lakes levels increase. The lake levels fluctuate throughout the year, with the highest levels in winter, spring, and early summer and lowest levels in the late summer and fall.

The properties in the repetitive loss area are at a lower elevation that the other properties surrounding the lake and are the first to be inundated when lake levels exceed normal elevations.

Exhibit 149. Repetitive Loss Area Summary (GRN 1).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Horseshoe Lake	1	0	0	2	1	3

Exhibit 150. Repetitive Loss Area Detailed Analysis (GRN 1).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1989	Crawl space	Average
			1991	Slab on grade	Average
			1991	Crawl space	Average

Exhibit 151. Repetitive Loss Area Field Survey Data (GRN 1).

Address	First Floor Elevation[1]	Possible Mitigation Options					
		Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	L	X					
	L			X			
	L			X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

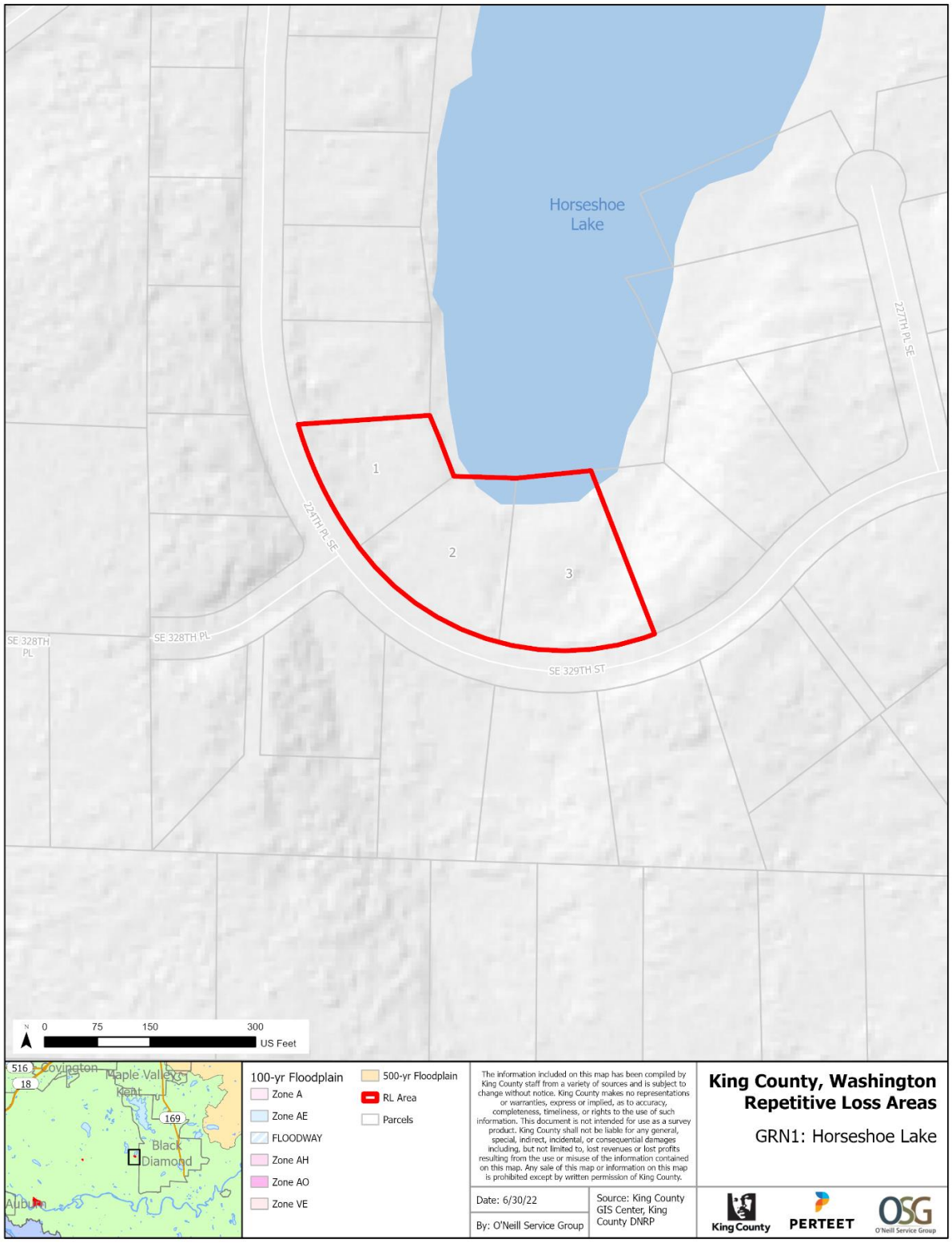
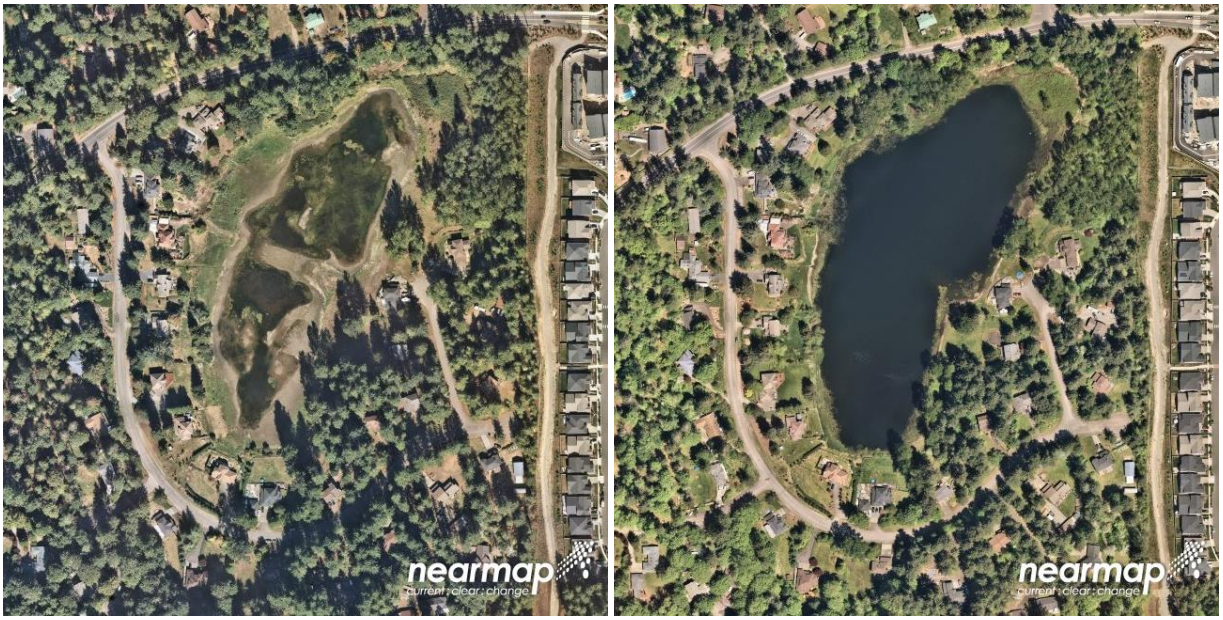


Exhibit 152. Horseshoe Lake (GRN 1).

Area Photos



Horseshoe Lake. September 21, 2021 (left) and May 22, 2022 (right).

Example Properties

Repetitive Loss Area 2: 192nd Avenue SE (GRN 2)

In accordance with the Privacy Act of 1974, information about individual repetitive loss properties will not be shared with the general public.

This property is within the 100-year floodplain of Covington Creek. The property is low and slopes down towards the creek from the road. The house sits lower than other houses in the vicinity.

Exhibit 153. Repetitive Loss Area Summary (GRN 2).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
192nd Avenue SE	1	0	0	0	1	1

Exhibit 154. Repetitive Loss Area Detailed Analysis (GRN 2).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1962	Slab on grade	Average

Exhibit 155. Repetitive Loss Area Field Survey Data (GRN 2).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	L	X	X				

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

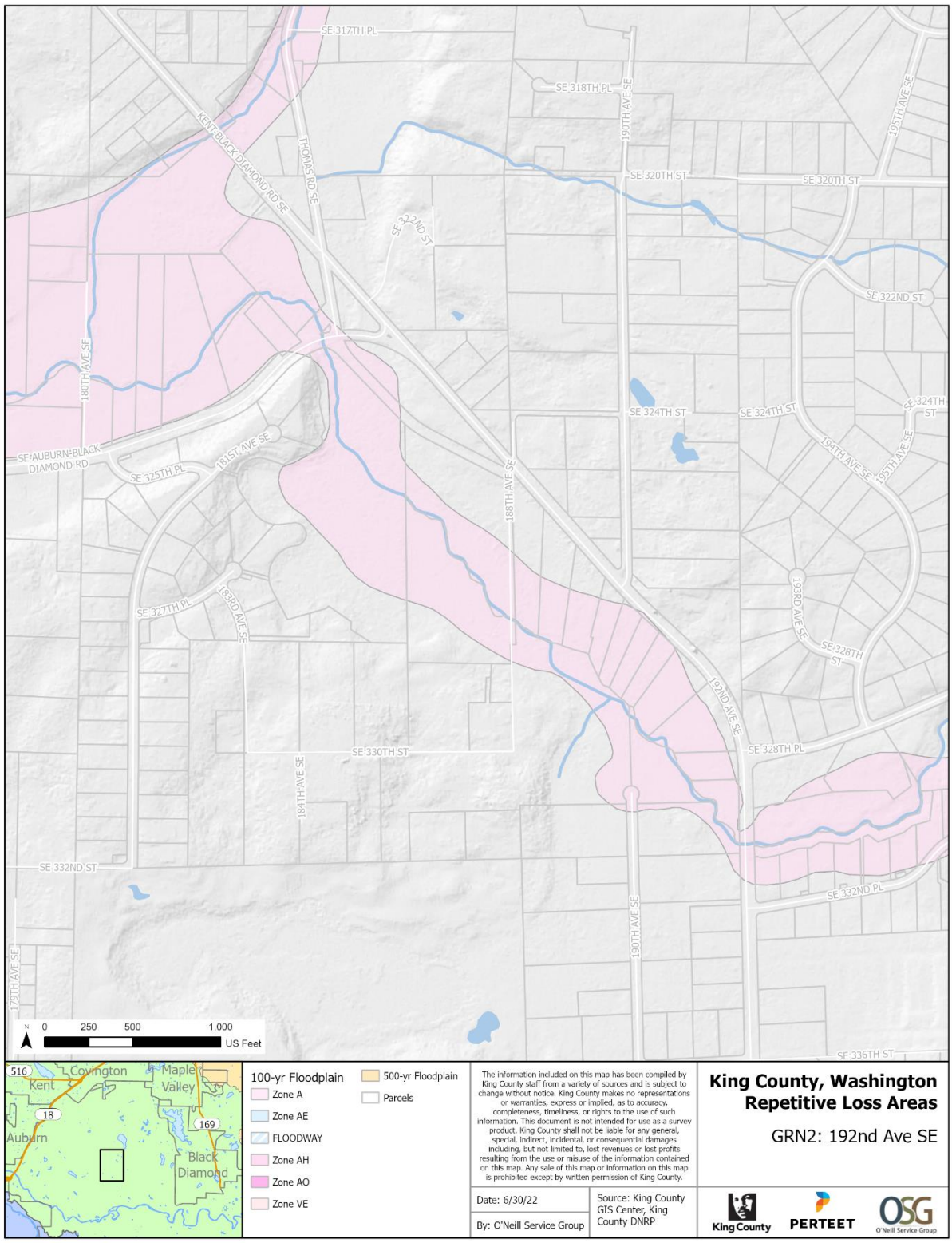


Exhibit 156. 192nd Avenue SE (GRN 2).

Repetitive Loss Area 3: Green Valley (GRN 3)

The Green Valley is an agricultural area along the Green River. The repetitive loss area properties are located alongside a side channel of the Green River and are partially within the 100-year floodplain. An adjacent property with similar risk was purchased by the County in 2014 to protect the high-quality side channel habitat and remove the risk of flooding to the residence.

Exhibit 157. Repetitive Loss Area Summary (GRN 3).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Green Valley	1	0	0	1	1	2

Exhibit 158. Repetitive Loss Area Detailed Analysis (GRN 3).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1990	Crawl space	Average
			1964	Split level	Average

Exhibit 159. Repetitive Loss Area Field Survey Data (GRN 3).

		Possible Mitigation Options						
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	L	X					
	A	X					

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

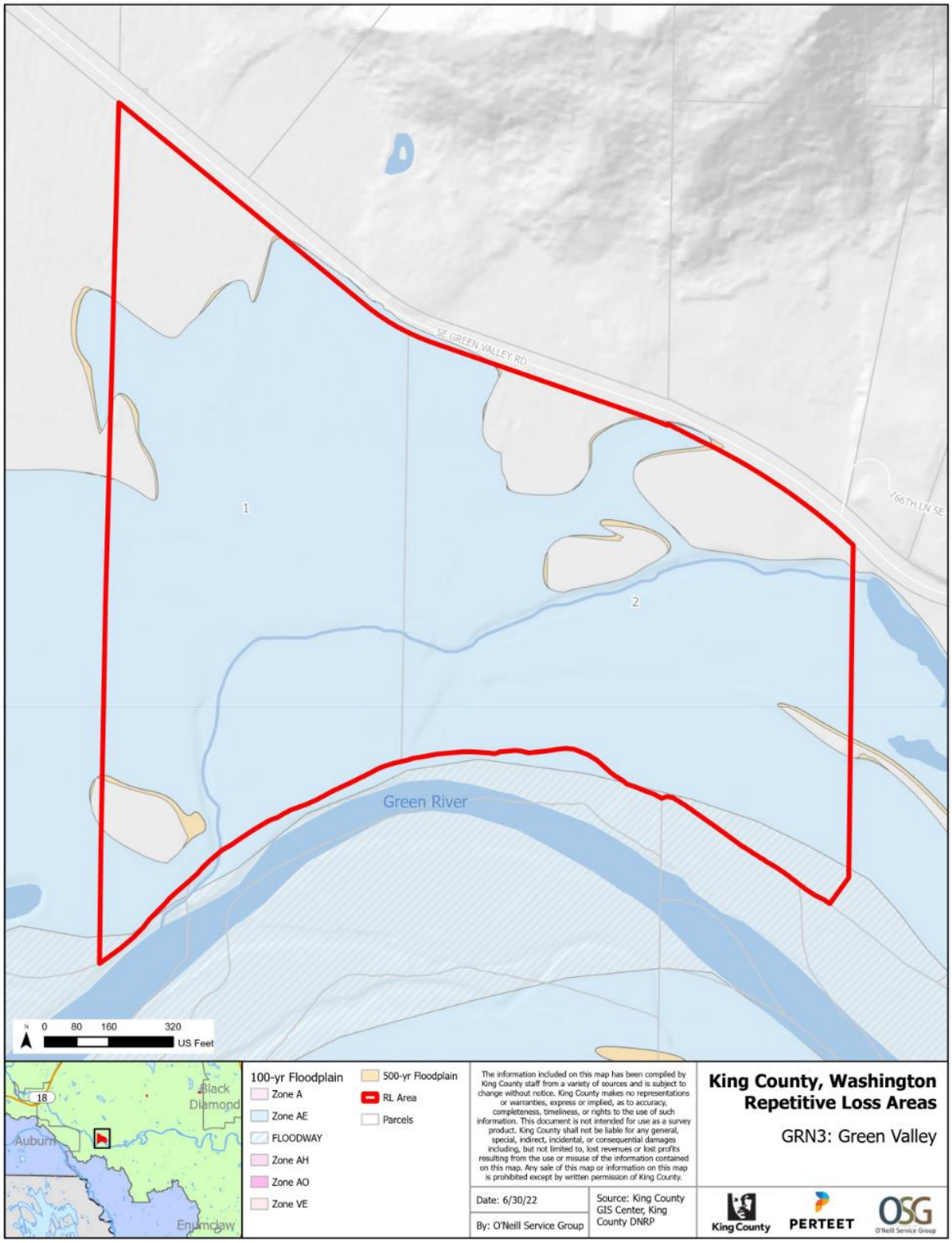


Exhibit 160. Green Valley (GRN 3).

Example Properties

Repetitive Loss Area 4: 440th Street (GRN 4)

In accordance with the Privacy Act of 1974, information about individual repetitive loss properties will not be shared with the general public.

This repetitive loss property is not within the floodplain nor is it close to any natural drainages, but there are drainage ditches across the street and nearby. The structure, constructed in 1933, claimed losses in November and December 2015. The residence is not visible from the street.

Exhibit 161. Repetitive Loss Area Summary (GRN 4).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
440th Street	1	0	0	0	1	1

Exhibit 162. Repetitive Loss Area Detailed Analysis (GRN 4).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1933	Unknown	Good

Exhibit 163. Repetitive Loss Area Field Survey Data (GRN 4).

		Possible Mitigation Options					
Address	First Floor Elevation[1]	Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A			X		X	

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

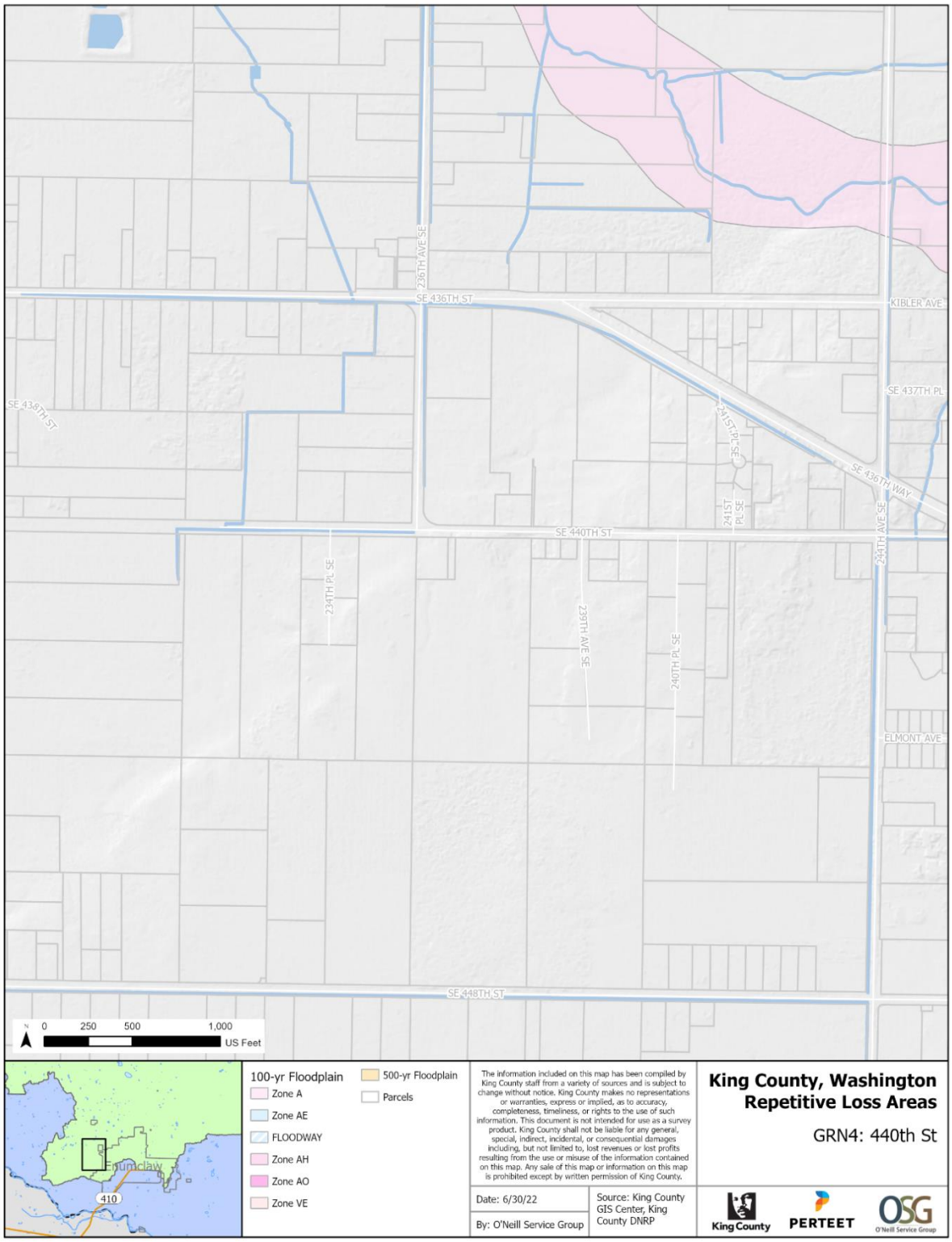


Exhibit 164. 440th Street (GRN 4).

Repetitive Loss Area 5: Newaukum Creek (GRN 5)

The Newaukum Creek repetitive loss area is located partially within the 100-year floodplain of Newaukum Creek and partially within areas alongside roadside ditches that are affected by flooding. The flooding from the repetitive loss property was associated with roadside ditch overflowing onto the property. Newaukum Creek crosses under SE 424th Street and during times of high flows, the creek water overflows into the drainage ditch which transports flood water outside of the 100-year floodplain.

Residents reported that flooding has increased since construction of a new school.

Exhibit 165. Repetitive Loss Area Summary (GRN 5).

Repetitive Loss Area	# of RL Properties	# of Mitigated RL Properties	# of Vacant Properties	# of Additional Properties	# of Properties with Insurance Claims	Total # of Properties in RL Area
Newaukum Creek	1	0	3	10	1	14

Exhibit 166. Repetitive Loss Area Detailed Analysis (GRN 5).

Address	# Claims	NFIP Insurance	Year Constructed	Foundation Type	Condition
Addresses, claims, and insurance information is omitted from the external version.			1968	Slab on grade	Average
			1944	Unknown	Poor
			1935	Crawl space	Average
			1936	Slab on grade	Average
			1938	Crawl space	Poor
			1991	Slab on grade	Average
			1960	Crawl space	Good
			1952	Crawl space	Average
			1993	Crawl space	Average

Exhibit 167. Repetitive Loss Area Field Survey Data (GRN 5).

Address	First Floor Elevation[1]	Possible Mitigation Options: Elevate/ Replace/ Relocate	Acquire/ Demolish	Modify (HVAC, etc.)	Capital Projects	Drainage Maint.	Other
Addresses are omitted from the external version.	A			X		X	
	A			X			
	A			X			
	A		X	X		X	
	A			X		X	
	A			X			
	A	X		X		X	
	A			X		X	
	A			X			

[1] First floor height compared to others in the same RL area. A = average height, H = higher than average, L = lower than average

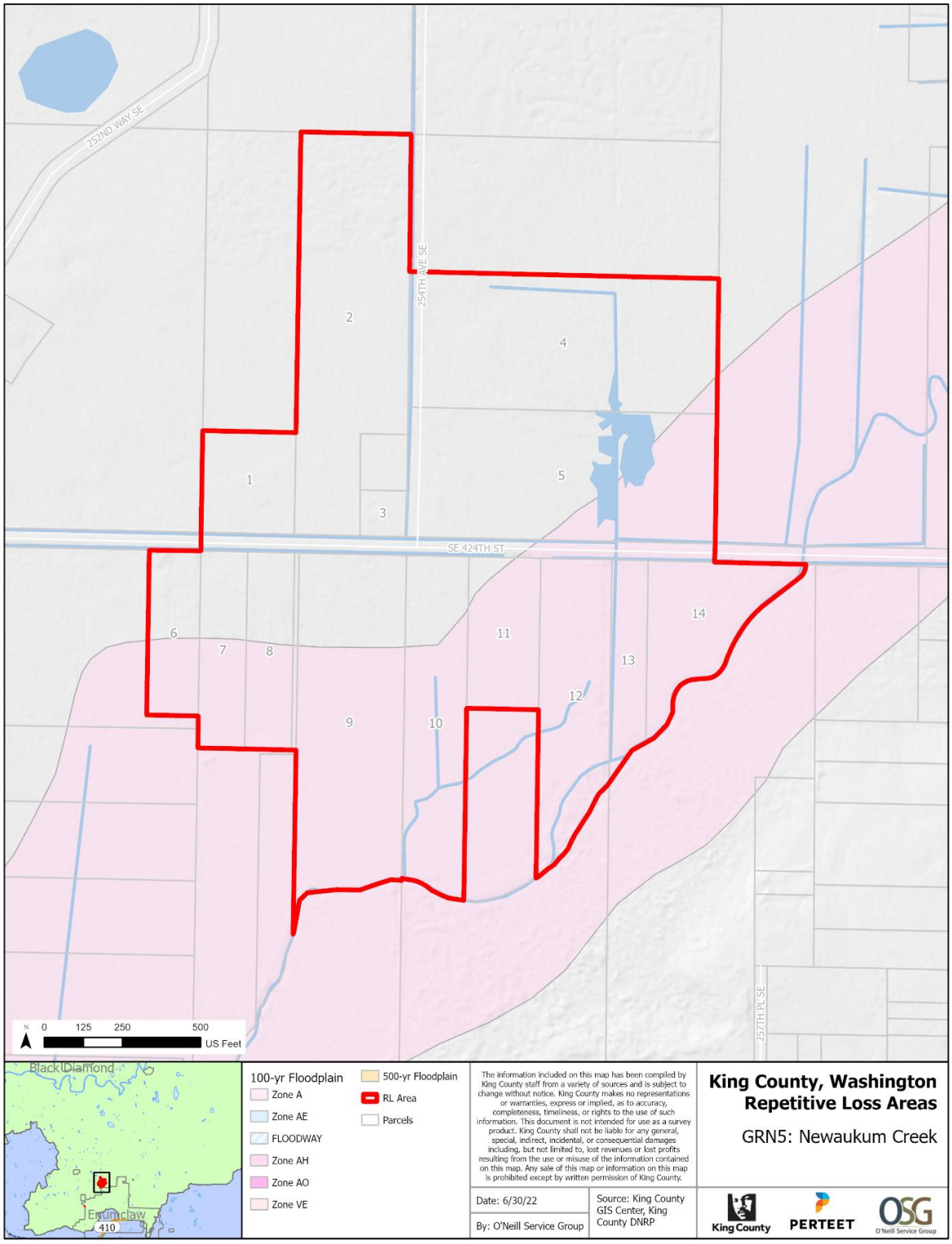


Exhibit 168. Newaukum Creek (GRN 5).

Example Properties

APPENDIX A

Repetitive Loss Property Notification Letter

PROPERTY OWNER NOTIFICATION LETTER

Water and Land Resources Division
Service provider to the King County Flood Control District
Department of Natural Resources and Parks
King Street Center
201 South Jackson Street, Mailstop 5600
Seattle, WA 98104-3855
206-477-4800 Fax 206-296-0192
TTY Relay: 711

June 13, 2022

Address
City, State Zip Code

Dear Property Owner or Resident,

At King County, we're concerned about flooding on properties and working to better understand where and how it happens. You have received this letter because your property is in a Repetitive Loss Area that has flooded several times. This does not mean that your property has flooded, only that it is in the same neighborhood as a property that has flooded multiple times. While we work to reduce flood risks, here are things you can do to prepare and help protect yourself from floods:

1. **Tell us about flooding at your property and what you think causes it.** Take our online survey at: surveymonkey.com/r/KC_RLAA. You can also share your responses by completing the enclosed survey below and returning it by mail. **Surveys must be completed and returned by June 30, 2022.** We encourage you to provide any relevant flood information.

Scan with smart phone

To help determine causes of repeated flooding, King County field teams will visit your neighborhood over the next two weeks to assess the flood risk and to take photographs. Field staff will not access your property and will only gather information viewable from the street. Staff will be looking at drainage patterns to identify possible sources of flooding (rivers, streams, ditches, ponding water, etc.) as well as the type and condition of building foundations.

Once our evaluation is complete, we will provide a draft copy of the report to survey participants and will be accepting your feedback. If you would like a copy of the draft report, please provide your email address within the survey.

2. **Buy flood insurance:** Homeowners or renters insurance does not cover loss caused by flooding. Purchasing flood insurance is important. Your property is eligible for a 40 percent flood insurance premium discount. Flood insurance to protect contents is available to both renters and property owners. To learn more visit floodsmart.gov, talk to your insurance agent, or contact me.

3. **Prepare for flooding:**
   - Sign up for King County Flood Alerts by visiting kingcounty.gov/flood and download the King County Flood Warning mobile app to find out when rivers are rising.
   - Update your emergency plans and put together an emergency kit.

- Know how to shut off the electricity and gas to your house before a flood event.
- Store valuables and household chemicals above flood levels.

4. **Protect your property from flooding:**
   - Move vehicles, equipment, livestock, or pets to higher ground.
   - Anchor and secure propane tanks and other fuel containers.
   - Install a floor drain plug or sewer backup valve.
   - Keep street drains, storm grates and flap gates free of leaves and debris.
   - Consider elevating your property. Learn more at kingcounty.gov/buyout-elevation.

Thank you for your interest and support in reducing repetitive flood losses in your neighborhood! Together we can help minimize flood losses and maximize the safety and enjoyment of your home.

If you have any questions or would prefer to respond to the survey by phone, please feel free to contact me directly at 206-477-7568 or lahendrix@kingcounty.gov. I look forward to hearing from you.

Sincerely,

Laura Hendrix, CFM
Floodplain Management Planner

Alternative Formats Available

Interpretation and translation services are available to you at no cost. If you need them, please contact us at lahendrix@kingcounty.gov or 206-477-7568 (TTY) Relay: 711.

King County Repetitive Loss Area Analysis

You can respond to the survey online at **surveymonkey.com/r/KC_RLAA** or fill out the hard copy below. Please return your responses by June 30, 2022 to:

Attn: Laura Hendrix
King County Water and Land Resources Division
201 South Jackson Street, Suite 5600
Seattle, WA 98104

Scan with smart phone

1. Please provide your address. Your response will be used by King County to better understand the flooding in your area.

Address:_____

2. If you would like to review the draft Repetitive Loss Area Analysis, please provide your email address.

Email address:_____

3. How many years have you lived at this address or owned the property? Select one.

- ☐ Less than 1 year
- ☐ 1-5 years
- ☐ 5-10 years
- ☐ 10+ years

4. Do you rent or own the property? Select one.

- ☐ Rent
- ☐ Own

5. What type of foundation does the home/building have? Select all that apply.

- ☐ Slab
- ☐ Crawlspace
- ☐ Basement
- ☐ Ground floor garage
- ☐ Piers
- ☐ I don't know

6. Has the home/building or property ever flooded or had a water problem? Select one.

- ☐ Yes
- ☐ No (if "no," skip to question 10)
- ☐ I don't know

7. In what year(s) did it flood? Please list all years.

_____

8. Where did you get flood water and how deep was it? Circle the depth in each location.

In the basement	No flood water	Less than 1 foot	1-2 feet	3-4 feet	5+ feet
In the crawlspace	No flood water	Less than 1 foot	1-2 feet	3-4 feet	5+ feet
In the first floor	No flood water	Less than 1 foot	1-2 feet	3-4 feet	5+ feet
In the yard/field only	No flood water	Less than 1 foot	1-2 feet	3-4 feet	5+ feet

9. If flood water entered your home/building, how long did it stay?

- ☐ Less than 1 day
- ☐ 1-2 days
- ☐ 3+ days

10. What do you think causes the flooding in your area? Check all that apply.

- ☐ Flooding from a waterbody (river, creek, lake, etc.)
- ☐ Saturated ground / ground water
- ☐ Blocked or undersized drainages/ditches/stormwater system
- ☐ Other (please specify)

11. What flood protection measures have you installed on your property? Check all that apply.

- ☐ Sump pump
- ☐ Waterproofed the outside walls
- ☐ Re-graded yard to keep flood water away
- ☐ Moved things out of basement
- ☐ Backup power system/generator
- ☐ Elevated structure
- ☐ Other (please specify)

12. Is the home/building located in the 1% chance floodplain (also known as the FEMA 100-year floodplain)? Select one.

- ☐ Yes
- ☐ No
- ☐ I don't know

13. Do you have FEMA flood insurance? Select one.

- ☐ Yes
- ☐ No
- ☐ I don't know

14. Please provide any additional information or comments you have about flooding in your area.

---

15. Would you like to receive additional information about how you can protect your home/building from flooding?

- ☐ No
- ☐ Yes, please contact me with more information.

Water and Land Resources Division
Service provider to the King County Flood Control District
Department of Natural Resources and Parks
King Street Center
201 South Jackson Street, Mailstop 5600
Seattle, WA 98104-3855
206-477-4800 Fax 206-296-0192
TTY Relay: 711

Estimado/a propietario/a o residente:

En el Condado de King estamos preocupados por las inundaciones en propiedades y estamos trabajando para entender mejor dónde y cómo ocurren. Usted ha recibido esta carta debido a que su propiedad está en un Área de Pérdida Repetitiva que se ha inundado varias veces. Esto no significa que su propiedad se haya inundado, solo que está en el mismo vecindario de una propiedad que se ha inundado en múltiples ocasiones. Mientras trabajamos para reducir los riesgos de inundaciones, aquí hay cosas que puede hacer para prepararse y ayudar a protegerse de las inundaciones:

1. **Díganos sobre las inundaciones en su propiedad y sobre lo que usted piensa que las causan.** Tome la encuesta en línea en: surveymonkey.com/r/AAPR. También puede compartir sus respuestas al completar la encuesta adjunta a continuación y devolverla por correo postal. **Las encuestas deben completarse y devolverse a más tardar el 30 de junio de 2022.** Le motivamos a que nos comparta cualquier información relevante a las inundaciones.

Escanear con el teléfono

Para ayudar a determinar las causas de las inundaciones recurrentes, los equipos en campo del Condado de King visitarán su vecindario en las próximas dos semanas para evaluar los riesgos de inundación y para tomar fotografías. El personal en campo no accederá a su propiedad y solo recabará información visible desde la calle. El personal estará buscando a patrones de drenaje para identificar posibles fuentes de inundaciones (ríos, arroyos, diques, agua estancada, etc.) así como el tipo y condición de los cimientos de la construcción.

Una vez que se complete la evaluación, le otorgaremos un borrador del reporte a los participantes de la encuesta y aceptaremos sus comentarios. Si quiere una copia del borrador del reporte, por favor, otorgue su dirección de correo electrónico junto con la encuesta.

2. **Compre seguro para inundaciones:** El seguro para propietarios o arrendatarios de vivienda, no cubre las pérdidas causadas por las inundaciones. Comprar un seguro para inundaciones es importante. Su propiedad es elegible para un descuento de 40 por ciento de la prima del seguro para inundaciones. El seguro para inundaciones para proteger los contenidos de su propiedad está disponible tanto para arrendatarios como para propietarios de vivienda. Para obtener más información, visite floodsmart.gov, hable con su agente de seguro o contácteme.

3. **Prepárese para las inundaciones:**
    - Regístrese para recibir Alertas de Inundaciones en el Condado de King al visitar kingcounty.gov/flood y descargue la aplicación móvil de Advertencia de Inundaciones del Condado de King para saber cuándo está subiendo el nivel de los ríos.
    - Actualice sus planes de emergencia y prepare un kit de emergencia.
    - Sepa cómo cortar la electricidad y el gas de su casa antes de un evento de inundación.
    - Guarde los objetos de valor y las sustancias químicas para la casa arriba de los niveles del suelo.

4. **Proteja su propiedad en contra de inundaciones:**
    - Mueva los vehículos, equipo, ganado o mascotas a una zona más alta.
    - Ancle y asegure los tanques de propano y otros contenedores de combustible.
    - Instale un tapón de desagüe en el piso o una válvula antirretorno de drenaje.
    - Mantenga las alcantarillas de la calle, las rejillas y compuertas para el desagüe libres de hojas y basura.
    - Considere elevar el nivel de su propiedad. Obtenga más información en kingcounty.gov/buyout-elevation.

¡Gracias por su interés y apoyo para reducir las pérdidas repetitivas por inundaciones en su vecindario! Juntos, podemos minimizar las pérdidas por inundaciones y maximizar la seguridad y el disfrute de su casa.

Si tiene preguntas o si prefiere responder a la encuesta por teléfono, por favor, no dude en contactarme directamente al 206-477-7568 o a lahendrix@kingcounty.gov. Espero saber de usted.

Atentamente,

Laura Hendrix, CFM
Planeadora de Gestión de Terrenos Inundables

Formatos Alternativos Disponibles

Hay servicios de interpretación y traducción disponibles para usted, sin costo. Si los necesita, por favor, contáctenos a lahendrix@kingcounty.gov o al 206-477-7568 Retransmisión TTY: 711.

Análisis del Área de Pérdida Repetitiva del Condado de King

Puede responder a la encuesta en línea en **surveymonkey.com/r/AAPR** o llenar la siguiente copia en papel. Por favor, devuelva las respuestas a más tardar el 30 de junio de 2022 a:

Attn: Laura Hendrix
King County Water and Land Resources Division
201 South Jackson Street, Suite 5600
Seattle, WA 98104

Escanear con el teléfono

1. Por favor, otorgue su dirección. Su respuesta será usada por el Condado de King para entender mejor las inundaciones en su área.

Dirección: _____

5. **Si quiere revisar el borrador del Análisis del Área de Pérdida Repetitiva, por favor, agregue su correo electrónico.**

Correo electrónico: _____

6. **¿Cuántos años ha vivido en esta dirección o ha sido dueño/a de la propiedad? Seleccione uno**
   - ☐ Menos de 1 año
   - ☐ 1-5 años
   - ☐ 5-10 años
   - ☐ Más de 10 años

7. **¿Usted renta o es dueño/a de la propiedad? Seleccione una opción.**
   - ☐ Rento
   - ☐ Soy dueño/a

8. **¿Qué tipo de cimientos tiene la casa/edificio? Selecciona todas las opciones que correspondan.**
   - ☐ Losa de concreto
   - ☐ Bloques y con espacio entre el suelo y la construcción
   - ☐ Sótano
   - ☐ Cochera en el primer piso
   - ☐ Pilares
   - ☐ No sé

9. **¿La casa/edificio o propiedad alguna vez se ha inundado o ha tenido un problema de agua? Seleccione una opción.**
   - ☐ Sí
   - ☐ No (en caso que "no," pase a la pregunta 10)
   - ☐ No sé

10. **¿En qué año(s) se inundó? Por favor, indique todos los años.**

_____

11.¿En qué parte tuvo agua de inundación y qué tan profunda estaba? Circule la profundidad en cada lugar.

En el sótano	No ha habido agua de inundación	Menos de 1 pie	1-2 pies	3-4 pies	Más de 5 pies
En el espacio entre el suelo y la casa	No ha habido agua de inundación	Menos de 1 pie	1-2 pies	3-4 pies	Más de 5 pies
En el primer piso	No ha habido agua de inundación	Menos de 1 pie	1-2 pies	3-4 pies	Más de 5 pies

Solo en el patio/campo	No ha habido agua de inundación	Menos de 1 pie	1-2 pies	3-4 pies	Más de 5 pies

12. Si el agua de inundación entró a su casa/edificio, ¿por cuánto tiempo permaneció ahí?

- ☐ Menos de 1 día
- ☐ 1-2 días
- ☐ Más de 3 días

13. ¿Qué es lo que cree que causa las inundaciones en su área? Marque todas las opciones que correspondan.

- ☐ Inundaciones a partir de un cuerpo de agua (río, arroyo, lago, etc.)
- ☐ Terreno saturado / agua subterránea
- ☐ Drenajes/diques/ sistemas para agua pluvial bloqueados o de tamaño insuficiente
- ☐ Otro (por favor, especifique)

14. ¿Qué medidas de protección en contra de las inundaciones ha instalado usted en su propiedad? Marque todas las opciones que correspondan.

- ☐ Bomba de sumidero
- ☐ Paredes exteriores en contra del agua
- ☐ Nivelación del patio para alejar el agua
- ☐ Sacar las cosas del sótano
- ☐ Sistema de energía de respaldo/generador
- ☐ Estructura elevada
- ☐ Otro (por favor, especifique)

15. ¿Está la casa/edificio ubicado en un terreno inundable con 1 % de posibilidad (también conocido como terrenos inundables de 100 años de FEMA)? Seleccione una opción.

- ☐ Sí
- ☐ No
- ☐ No sé

16. ¿Tiene seguro para inundaciones de FEMA? Seleccione una opción.

- ☐ Sí
- ☐ No
- ☐ No sé

17. Por favor, agregue cualquier información adicional o comentarios que tenga sobre las inundaciones en su área.

---

18. ¿Le gustaría recibir información adicional sobre cómo puede proteger su casa/edificio en contra de inundaciones?

- ☐ No
- ☐ Sí, por favor, contáctenme con más información.

APPENDIX B

Survey Results

Q1 Please provide your address. Your responses will be used by King County to better understand the flooding in your area.

Answered: 51 Skipped: 0

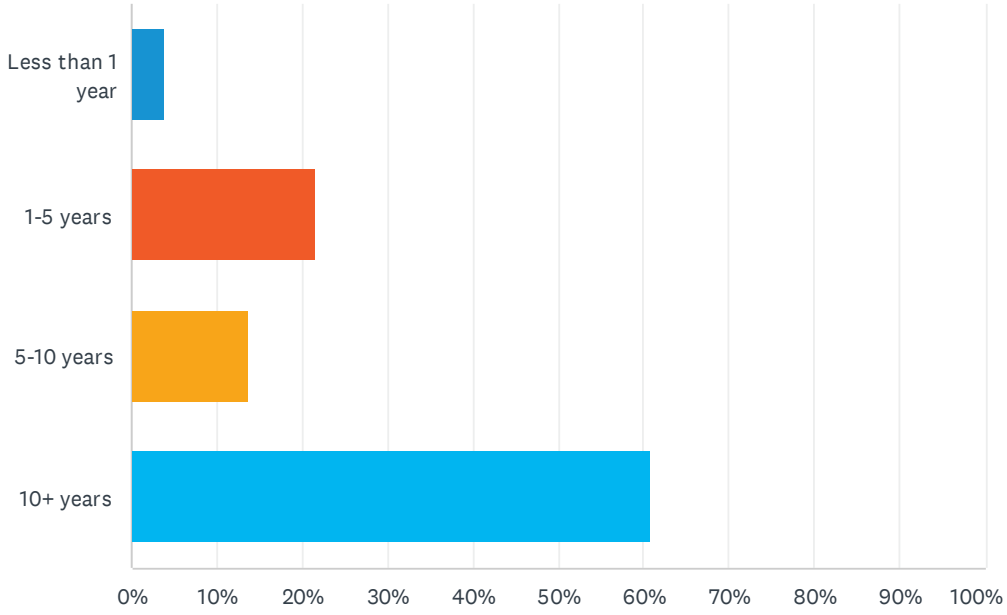
ANSWER CHOICES	RESPONSES	
Name	0.00%	0
Company	0.00%	0
Address	100.00%	51
Address 2	0.00%	0
City/Town	92.16%	47
Watershed	100.00%	51
ZIP/Postal Code	0.00%	0
Country	0.00%	0
Email Address	0.00%	0
Phone Number	0.00%	0

Q2 If you would like to review the draft Repetitive Loss Area Analysis, please provide your email address.

Answered: 42 Skipped: 9

Q3 How many years have you lived at this address or owned the property?

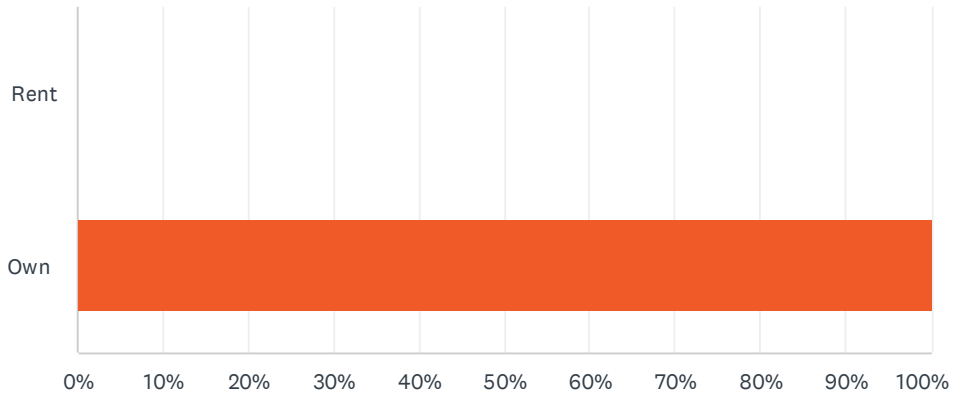
Answered: 51 Skipped: 0



ANSWER CHOICES	RESPONSES	
Less than 1 year	3.92%	2
1-5 years	21.57%	11
5-10 years	13.73%	7
10+ years	60.78%	31
TOTAL		51

Q4 Do you rent or own the property?

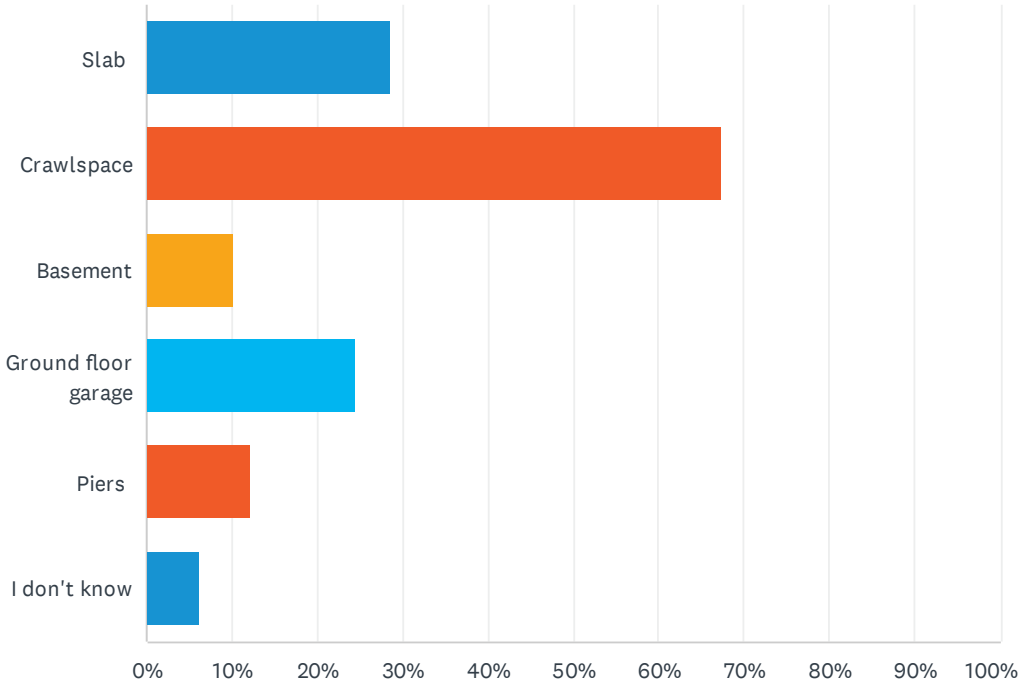
Answered: 51 Skipped: 0



ANSWER CHOICES	RESPONSES	
Rent	0.00%	0
Own	100.00%	51
TOTAL		51

Q5 What type of foundation does the home/building have? Select all that apply.

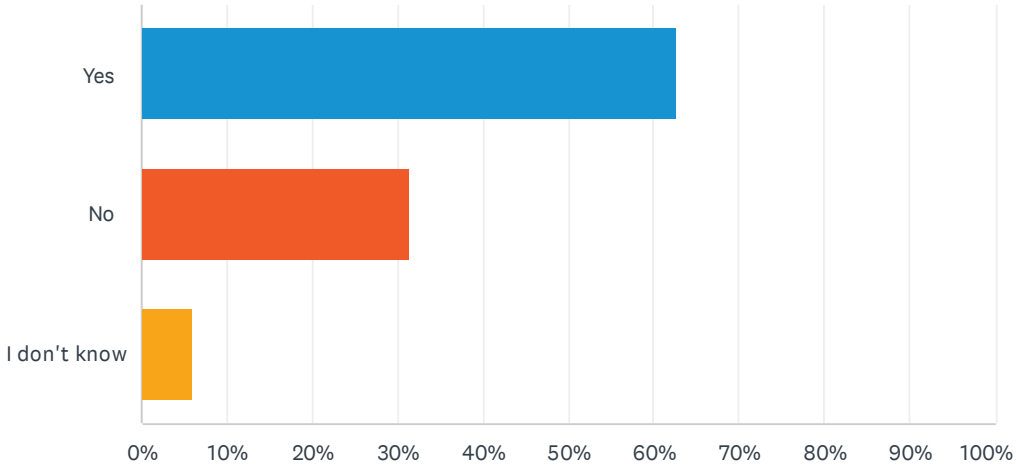
Answered: 49 Skipped: 2



ANSWER CHOICES	RESPONSES	
Slab	28.57%	14
Crawlspace	67.35%	33
Basement	10.20%	5
Ground floor garage	24.49%	12
Piers	12.24%	6
I don't know	6.12%	3
Total Respondents: 49		

Q6 Has the home/building or property ever flooded or had a water problem?

Answered: 51 Skipped: 0



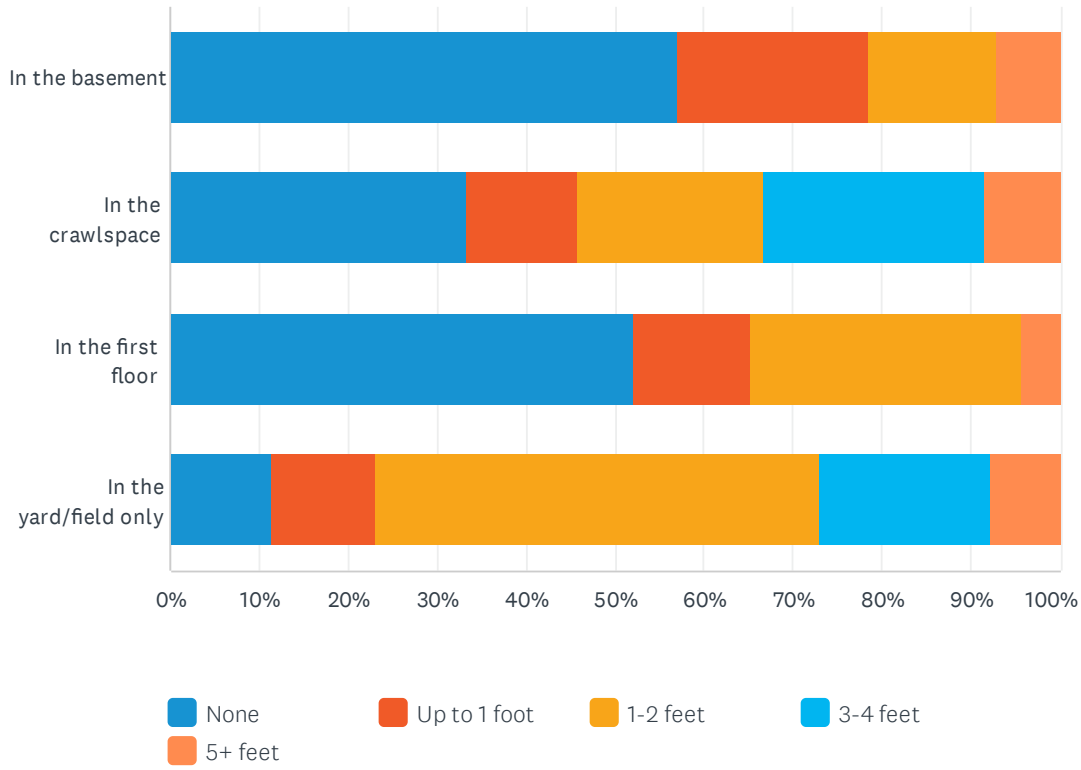
ANSWER CHOICES	RESPONSES	
Yes	62.75%	32
No	31.37%	16
I don't know	5.88%	3
TOTAL		51

Q7 In what year(s) did it flood?

Answered: 33 Skipped: 18

Q8 Where did you get flood water and how deep was it?

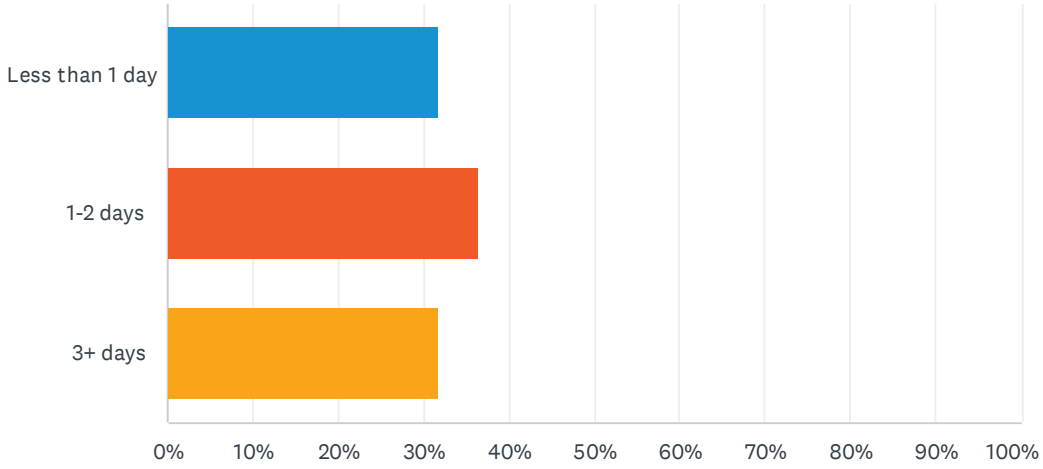
Answered: 33 Skipped: 18



	NONE	UP TO 1 FOOT	1-2 FEET	3-4 FEET	5+ FEET	TOTAL	WEIGHTED AVERAGE
In the basement	57.14% 8	21.43% 3	14.29% 2	0.00% 0	7.14% 1	14	1.79
In the crawlspace	33.33% 8	12.50% 3	20.83% 5	25.00% 6	8.33% 2	24	2.63
In the first floor	52.17% 12	13.04% 3	30.43% 7	0.00% 0	4.35% 1	23	1.91
In the yard/field only	11.54% 3	11.54% 3	50.00% 13	19.23% 5	7.69% 2	26	3.00

Q9 If flood water entered your home/building, how long did it stay?

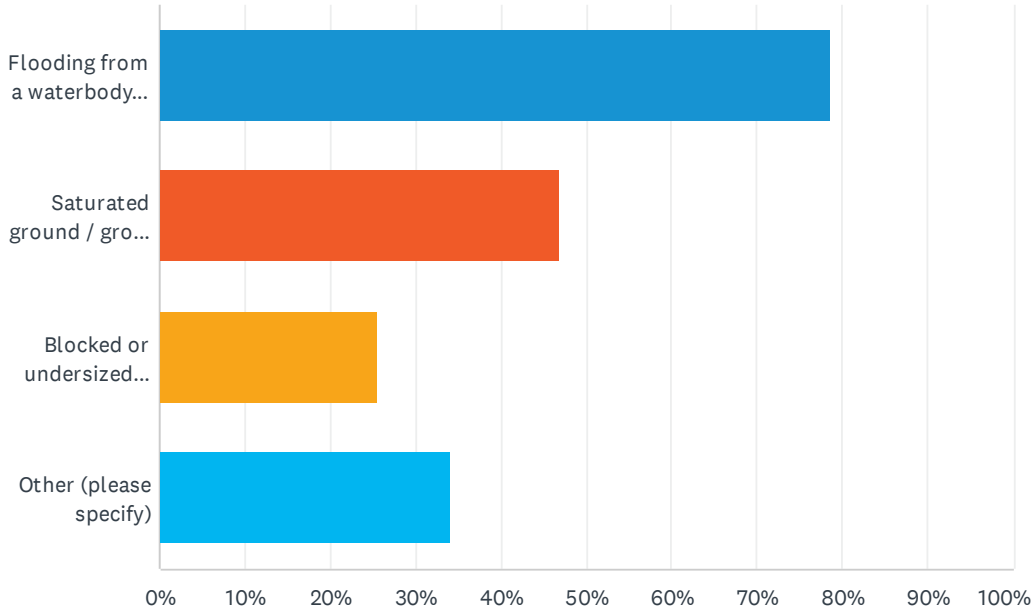
Answered: 22 Skipped: 29



ANSWER CHOICES	RESPONSES	
Less than 1 day	31.82%	7
1-2 days	36.36%	8
3+ days	31.82%	7
TOTAL		22

Q10 What do you think causes the flooding in your area? Check all that apply.

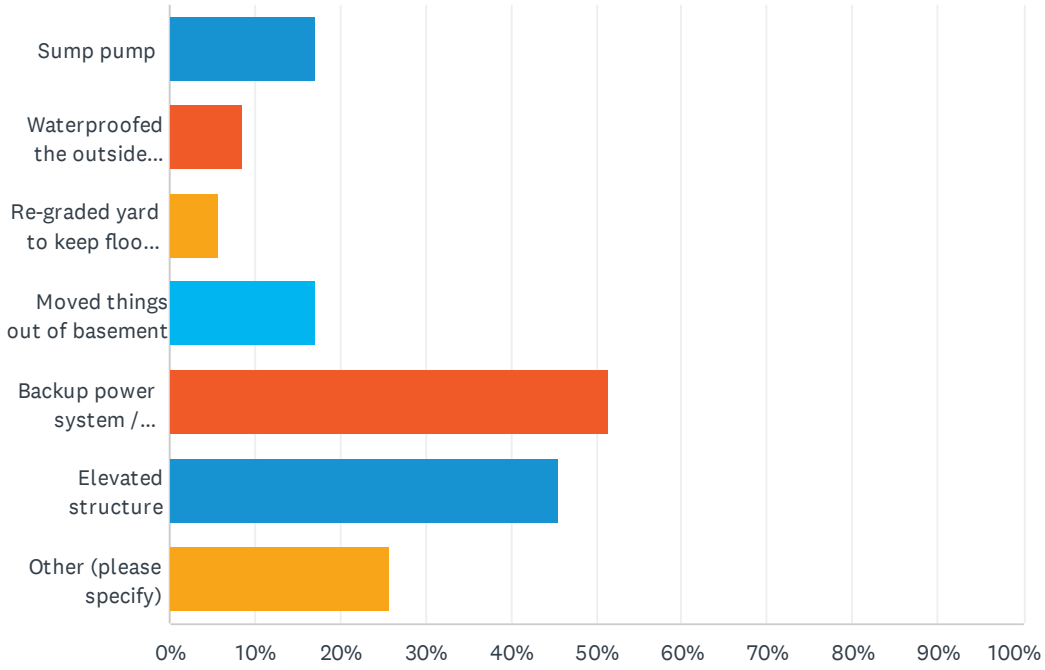
Answered: 47 Skipped: 4



ANSWER CHOICES	RESPONSES	
Flooding from a waterbody (river, creek, lake, etc.)	78.72%	37
Saturated ground / ground water	46.81%	22
Blocked or undersized drainages/ditches/stormwater system	25.53%	12
Other (please specify)	34.04%	16
Total Respondents: 47		

Q11 What flood protection measures have you installed on your property? Check all that apply.

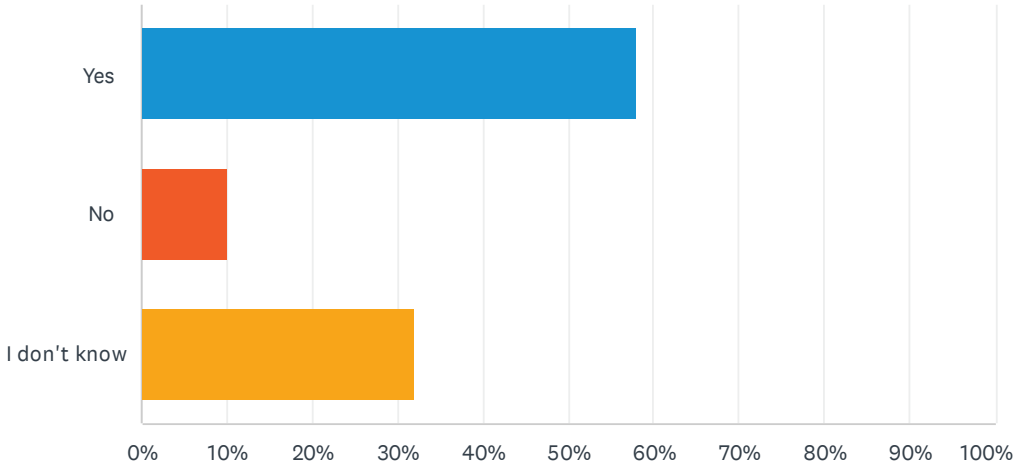
Answered: 35 Skipped: 16



ANSWER CHOICES	RESPONSES	
Sump pump	17.14%	6
Waterproofed the outside walls	8.57%	3
Re-graded yard to keep flood water away	5.71%	2
Moved things out of basement	17.14%	6
Backup power system / generator	51.43%	18
Elevated structure	45.71%	16
Other (please specify)	25.71%	9
Total Respondents: 35		

Q12 Is the home/building located in the 1% chance floodplain (also known as the FEMA 100-year floodplain)?

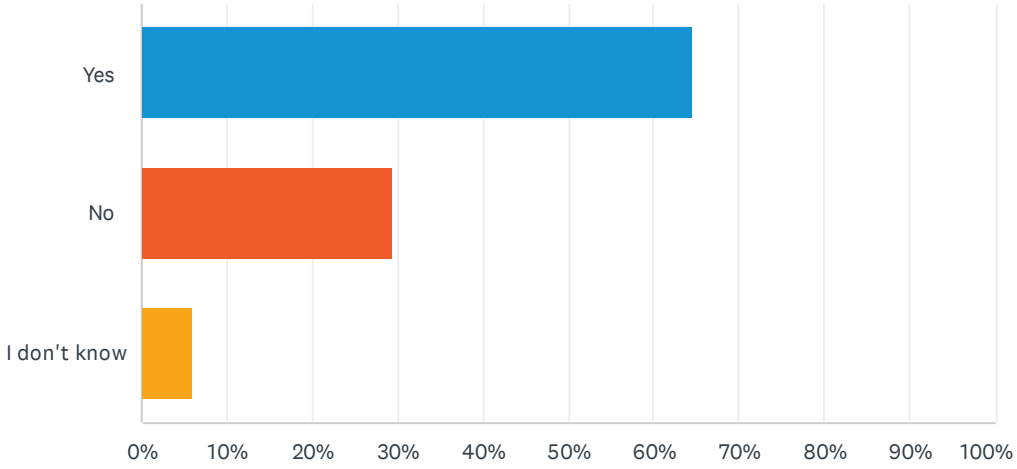
Answered: 50 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	58.00%	29
No	10.00%	5
I don't know	32.00%	16
TOTAL		50

Q13 Do you have FEMA flood insurance?

Answered: 51 Skipped: 0



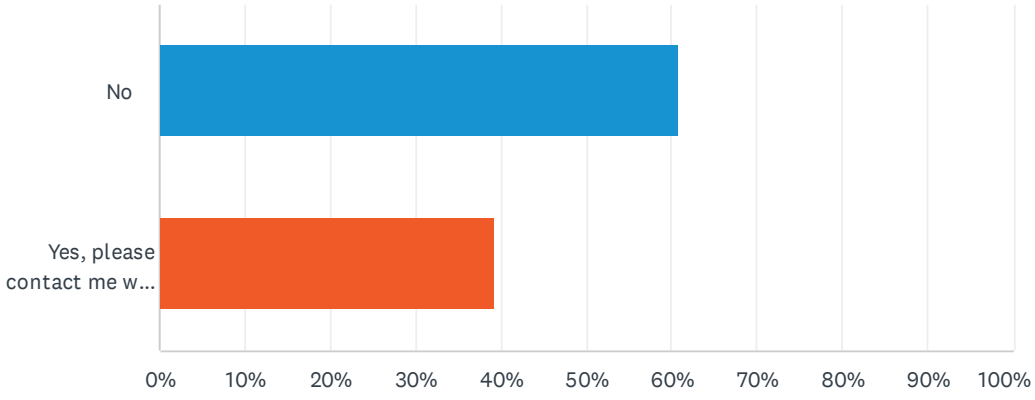
ANSWER CHOICES	RESPONSES	
Yes	64.71%	33
No	29.41%	15
I don't know	5.88%	3
TOTAL		51

Q14 Please provide any additional information or comments you have about flooding in your area.

Answered: 31 Skipped: 20

Q15 Would you like to receive additional information about how you can protect your home/building from flooding?

Answered: 46 Skipped: 5



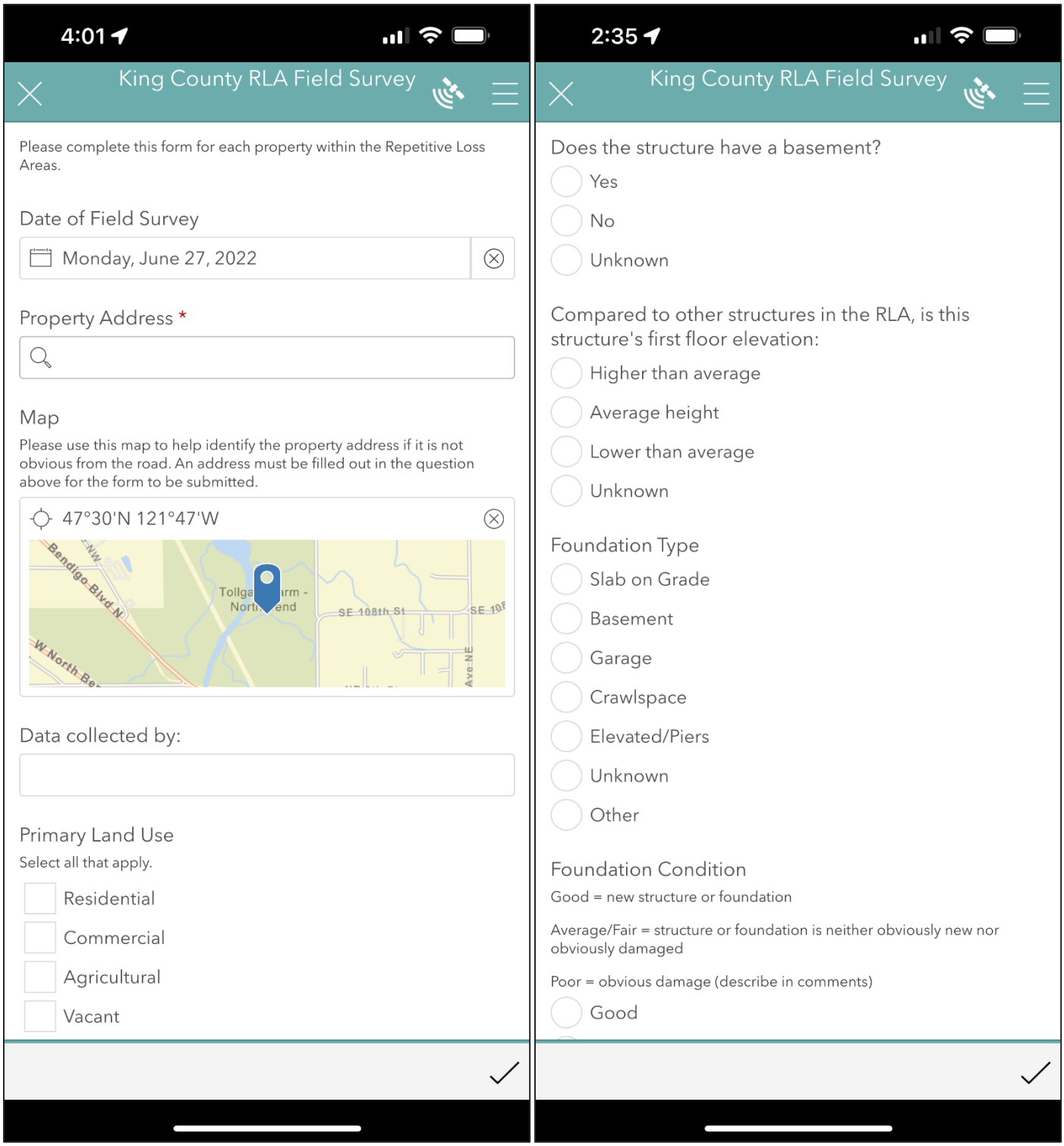
ANSWER CHOICES	RESPONSES	
No	60.87%	28
Yes, please contact me with more information.	39.13%	18
TOTAL		46

APPENDIX C

Field Survey

FIELD SURVEY

Basin crews used the mobile application Survey123 to collect data in the field.



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King County RLA Field Survey

Foundation Condition

Good = new structure or foundation

Average/Fair = structure or foundation is neither obviously new nor obviously damaged

Poor = obvious damage (describe in comments)

- ○ Good
- ○ Average/Fair
- ○ Poor
- ○ Unknown

Structure Condition

Good = new or very well kept structure

Average/Fair = neither good nor poor (most structures will be average)

Poor = Obvious need for improvements

- ○ Good
- ○ Average/Fair
- ○ Poor
- ○ Unknown

What type of mitigation may be effective for this property?

- ☐ Elevation/Replacement of Structure
- ☐ Relocation
- ☐ Acquisition/Demolition
- ☐ Elevate Components (e.g. HVAC)
- ☐ Drainage Maintenance
- ☐ Capital Improvement Projects (e.g. levee)

✓

2:35

King County RLA Field Survey

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What type of mitigation may be effective for this property?

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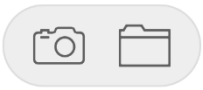
- ☐ Elevate Components (e.g. HVAC)
- ☐ Drainage Maintenance
- ☐ Capital Improvement Projects (e.g. levee)

Drainage Notes, Observations, and Comments

Photo(s)



✓