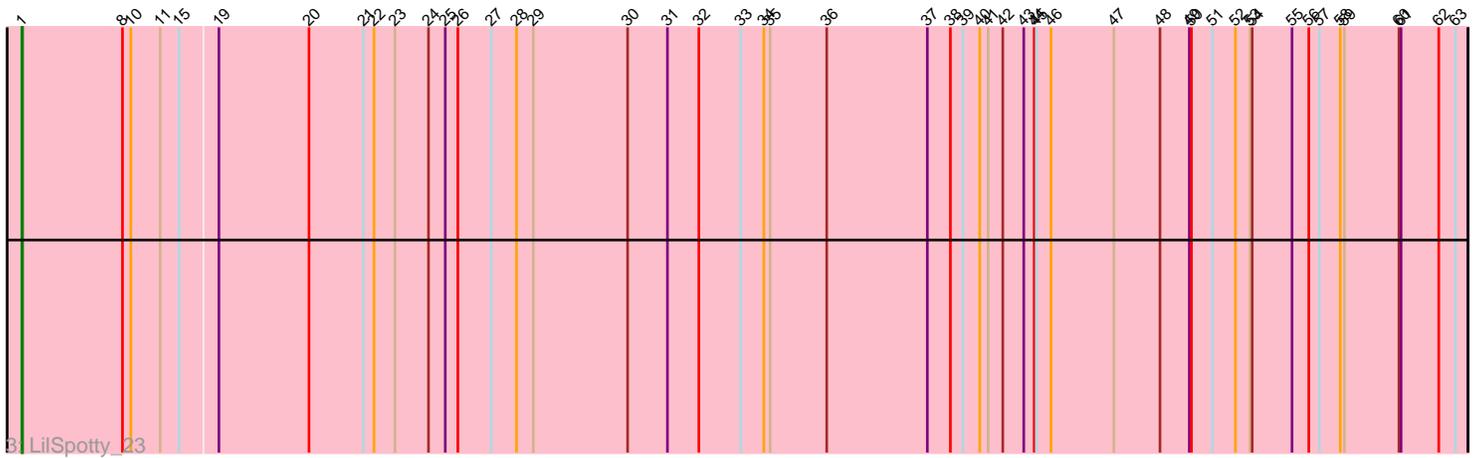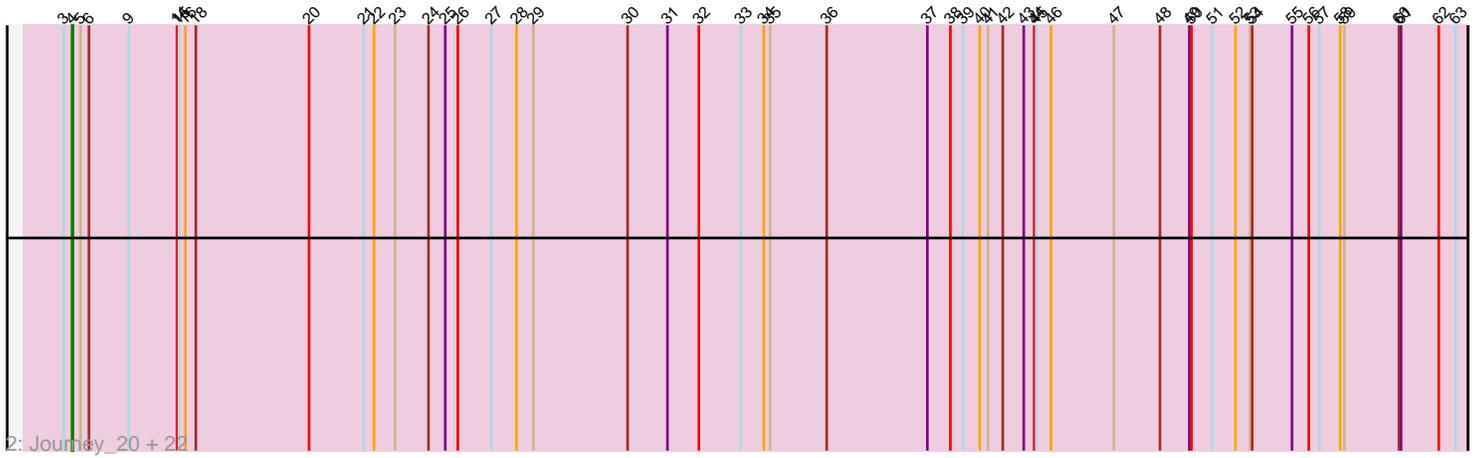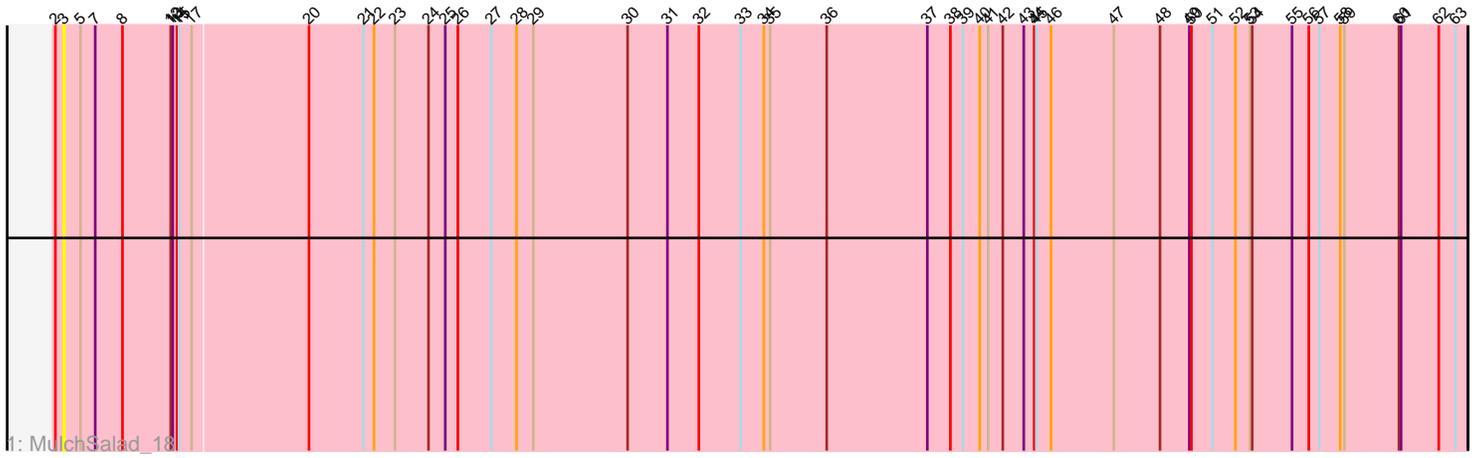# Pham 291473

Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

Pham 291473 Report

This analysis was run 03/28/26 on database version 641.

Pham number 291473 has 25 members, 3 are drafts.

Phages represented in each track:
• Track 1 : MulchSalad_18
• Track 2 : Journey_20, Xerxes_20, Silvy_20, Magsby_20, Charlie_20, EGUnicorn_20, Melville_20, Parmesanjohn_20, Smurph_20, Tortoise12_20, Chewbacca_20, Cubone_20, Schnauzer_20, Pipsqueaks_20, Philonius_20, Duplicity_20, Tapioca_20, Bosection6_20, Carcharodon_20, Tessdabest_19, Gex_20, Aggie_20, Silvafighter_20
• Track 3 : LilSpotty_23

Summary of Final Annotations (See graph section above for start numbers):

The start number called the most often in the published annotations is 4, it was called in 21 of the 22 non-draft genes in the pham.

Genes that call this "Most Annotated" start:
• Aggie_20, Bosection6_20, Carcharodon_20, Charlie_20, Chewbacca_20, Cubone_20, Duplicity_20, EGUnicorn_20, Gex_20, Journey_20, Magsby_20, Melville_20, Parmesanjohn_20, Philonius_20, Pipsqueaks_20, Schnauzer_20, Silvafighter_20, Silvy_20, Smurph_20, Tapioca_20, Tessdabest_19, Tortoise12_20, Xerxes_20,

Genes that have the "Most Annotated" start but do not call it:
•

Genes that do not have the "Most Annotated" start:
• LilSpotty_23, MulchSalad_18,

Summary by start number:

Start 1:
• Found in 1 of 25 (4.0%) of genes in pham
• Manual Annotations of this start: 1 of 22
• Called 100.0% of time when present
• Phage (with cluster) where this start called: LilSpotty_23 (singleton),

Start 3:
• Found in 24 of 25 (96.0%) of genes in pham
• No Manual Annotations of this start.
• Called 4.2% of time when present
• Phage (with cluster) where this start called: MulchSalad_18 (F7),

Start 4:
• Found in 23 of 25 (92.0%) of genes in pham
• Manual Annotations of this start: 21 of 22
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Aggie_20 (N), Bosection6_20 (N), Carcharodon_20 (N), Charlie_20 (N), Chewbacca_20 (N), Cubone_20 (N), Duplicity_20 (N), EGUnicorn_20 (N), Gex_20 (N), Journey_20 (N), Magsby_20 (N), Melville_20 (N), Parmesanjohn_20 (N), Philonius_20 (N), Pipsqueaks_20 (N), Schnauzer_20 (N), Silvafighter_20 (N), Silvy_20 (N), Smurph_20 (N), Tapioca_20 (N), Tessdabest_19 (N), Tortoise12_20 (N), Xerxes_20 (N),

Summary by clusters:

There are 3 clusters represented in this pham: singleton, F7, N,

Info for manual annotations of cluster N:
• Start number 4 was manually annotated 21 times for cluster N.

Gene Information:

Gene: Aggie_20 Start: 17557, Stop: 19551, Start Num: 4
Candidate Starts for Aggie_20:
(3, 17545), (Start: 4 @17557 has 21 MA's), (5, 17569), (6, 17581), (9, 17635), (14, 17704), (15, 17707), (16, 17716), (18, 17731), (20, 17893), (21, 17971), (22, 17986), (23, 18016), (24, 18064), (25, 18088), (26, 18106), (27, 18154), (28, 18190), (29, 18214), (30, 18349), (31, 18406), (32, 18451), (33, 18511), (34, 18544), (35, 18553), (36, 18634), (37, 18778), (38, 18811), (39, 18829), (40, 18853), (41, 18865), (42, 18886), (43, 18916), (44, 18931), (45, 18934), (46, 18955), (47, 19045), (48, 19111), (49, 19153), (50, 19156), (51, 19186), (52, 19219), (53, 19240), (54, 19243), (55, 19300), (56, 19324), (57, 19339), (58, 19369), (59, 19375), (60, 19453), (61, 19456), (62, 19510), (63, 19534),

Gene: Bosection6_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Bosection6_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Carcharodon_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Carcharodon_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),

(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),
(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864),
(42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152),
(50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338),
(58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Charlie_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Charlie_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706),
(16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),
(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),
(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864),
(42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152),
(50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338),
(58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Chewbacca_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Chewbacca_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706),
(16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),
(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),
(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864),
(42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152),
(50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338),
(58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Cubone_20 Start: 17578, Stop: 19572, Start Num: 4
Candidate Starts for Cubone_20:
(3, 17566), (Start: 4 @17578 has 21 MA's), (5, 17590), (6, 17602), (9, 17656), (14, 17725), (15, 17728),
(16, 17737), (18, 17752), (20, 17914), (21, 17992), (22, 18007), (23, 18037), (24, 18085), (25, 18109),
(26, 18127), (27, 18175), (28, 18211), (29, 18235), (30, 18370), (31, 18427), (32, 18472), (33, 18532),
(34, 18565), (35, 18574), (36, 18655), (37, 18799), (38, 18832), (39, 18850), (40, 18874), (41, 18886),
(42, 18907), (43, 18937), (44, 18952), (45, 18955), (46, 18976), (47, 19066), (48, 19132), (49, 19174),
(50, 19177), (51, 19207), (52, 19240), (53, 19261), (54, 19264), (55, 19321), (56, 19345), (57, 19360),
(58, 19390), (59, 19396), (60, 19474), (61, 19477), (62, 19531), (63, 19555),

Gene: Duplicity_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Duplicity_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706),
(16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),
(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),
(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864),
(42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152),
(50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338),
(58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: EGUnicorn_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for EGUnicorn_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706),
(16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),
(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),
(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864),
(42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152),

(50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Gex_20 Start: 17552, Stop: 19546, Start Num: 4
Candidate Starts for Gex_20:
(3, 17540), (Start: 4 @17552 has 21 MA's), (5, 17564), (6, 17576), (9, 17630), (14, 17699), (15, 17702), (16, 17711), (18, 17726), (20, 17888), (21, 17966), (22, 17981), (23, 18011), (24, 18059), (25, 18083), (26, 18101), (27, 18149), (28, 18185), (29, 18209), (30, 18344), (31, 18401), (32, 18446), (33, 18506), (34, 18539), (35, 18548), (36, 18629), (37, 18773), (38, 18806), (39, 18824), (40, 18848), (41, 18860), (42, 18881), (43, 18911), (44, 18926), (45, 18929), (46, 18950), (47, 19040), (48, 19106), (49, 19148), (50, 19151), (51, 19181), (52, 19214), (53, 19235), (54, 19238), (55, 19295), (56, 19319), (57, 19334), (58, 19364), (59, 19370), (60, 19448), (61, 19451), (62, 19505), (63, 19529),

Gene: Journey_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Journey_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: LilSpotty_23 Start: 18458, Stop: 20518, Start Num: 1
Candidate Starts for LilSpotty_23:
(Start: 1 @18458 has 1 MA's), (8, 18599), (10, 18611), (11, 18653), (15, 18680), (19, 18731), (20, 18860), (21, 18938), (22, 18953), (23, 18983), (24, 19031), (25, 19055), (26, 19073), (27, 19121), (28, 19157), (29, 19181), (30, 19316), (31, 19373), (32, 19418), (33, 19478), (34, 19511), (35, 19520), (36, 19601), (37, 19745), (38, 19778), (39, 19796), (40, 19820), (41, 19832), (42, 19853), (43, 19883), (44, 19898), (45, 19901), (46, 19922), (47, 20012), (48, 20078), (49, 20120), (50, 20123), (51, 20153), (52, 20186), (53, 20207), (54, 20210), (55, 20267), (56, 20291), (57, 20306), (58, 20336), (59, 20342), (60, 20420), (61, 20423), (62, 20477), (63, 20501),

Gene: Magsby_20 Start: 17553, Stop: 19547, Start Num: 4
Candidate Starts for Magsby_20:
(3, 17541), (Start: 4 @17553 has 21 MA's), (5, 17565), (6, 17577), (9, 17631), (14, 17700), (15, 17703), (16, 17712), (18, 17727), (20, 17889), (21, 17967), (22, 17982), (23, 18012), (24, 18060), (25, 18084), (26, 18102), (27, 18150), (28, 18186), (29, 18210), (30, 18345), (31, 18402), (32, 18447), (33, 18507), (34, 18540), (35, 18549), (36, 18630), (37, 18774), (38, 18807), (39, 18825), (40, 18849), (41, 18861), (42, 18882), (43, 18912), (44, 18927), (45, 18930), (46, 18951), (47, 19041), (48, 19107), (49, 19149), (50, 19152), (51, 19182), (52, 19215), (53, 19236), (54, 19239), (55, 19296), (56, 19320), (57, 19335), (58, 19365), (59, 19371), (60, 19449), (61, 19452), (62, 19506), (63, 19530),

Gene: Melville_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Melville_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: MulchSalad_18 Start: 17319, Stop: 19319, Start Num: 3
Candidate Starts for MulchSalad_18:
(2, 17307), (3, 17319), (5, 17340), (7, 17361), (8, 17400), (12, 17469), (13, 17472), (14, 17478), (15, 17481), (17, 17499), (20, 17661), (21, 17739), (22, 17754), (23, 17784), (24, 17832), (25, 17856), (26, 17874), (27, 17922), (28, 17958), (29, 17982), (30, 18117), (31, 18174), (32, 18219), (33, 18279), (34, 18312), (35, 18321), (36, 18402), (37, 18546), (38, 18579), (39, 18597), (40, 18621), (41, 18633), (42, 18654), (43, 18684), (44, 18699), (45, 18702), (46, 18723), (47, 18813), (48, 18879), (49, 18921), (50, 18924), (51, 18954), (52, 18987), (53, 19008), (54, 19011), (55, 19068), (56, 19092), (57, 19107), (58, 19137), (59, 19143), (60, 19221), (61, 19224), (62, 19278), (63, 19302),

Gene: Parmesanjohn_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Parmesanjohn_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Philonius_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Philonius_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Pipsqueaks_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Pipsqueaks_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Schnauzer_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Schnauzer_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Silvafighter_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Silvafighter_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706),
(16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),
(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),
(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864),
(42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152),
(50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338),
(58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Silvy_20 Start: 17557, Stop: 19551, Start Num: 4
Candidate Starts for Silvy_20:
(3, 17545), (Start: 4 @17557 has 21 MA's), (5, 17569), (6, 17581), (9, 17635), (14, 17704), (15, 17707),
(16, 17716), (18, 17731), (20, 17893), (21, 17971), (22, 17986), (23, 18016), (24, 18064), (25, 18088),
(26, 18106), (27, 18154), (28, 18190), (29, 18214), (30, 18349), (31, 18406), (32, 18451), (33, 18511),
(34, 18544), (35, 18553), (36, 18634), (37, 18778), (38, 18811), (39, 18829), (40, 18853), (41, 18865),
(42, 18886), (43, 18916), (44, 18931), (45, 18934), (46, 18955), (47, 19045), (48, 19111), (49, 19153),
(50, 19156), (51, 19186), (52, 19219), (53, 19240), (54, 19243), (55, 19300), (56, 19324), (57, 19339),
(58, 19369), (59, 19375), (60, 19453), (61, 19456), (62, 19510), (63, 19534),

Gene: Smurph_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Smurph_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706),
(16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),
(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),
(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864),
(42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152),
(50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338),
(58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Tapioca_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Tapioca_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706),
(16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),
(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),
(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864),
(42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152),
(50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338),
(58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Tessdabest_19 Start: 17553, Stop: 19547, Start Num: 4
Candidate Starts for Tessdabest_19:
(3, 17541), (Start: 4 @17553 has 21 MA's), (5, 17565), (6, 17577), (9, 17631), (14, 17700), (15, 17703),
(16, 17712), (18, 17727), (20, 17889), (21, 17967), (22, 17982), (23, 18012), (24, 18060), (25, 18084),
(26, 18102), (27, 18150), (28, 18186), (29, 18210), (30, 18345), (31, 18402), (32, 18447), (33, 18507),
(34, 18540), (35, 18549), (36, 18630), (37, 18774), (38, 18807), (39, 18825), (40, 18849), (41, 18861),
(42, 18882), (43, 18912), (44, 18927), (45, 18930), (46, 18951), (47, 19041), (48, 19107), (49, 19149),
(50, 19152), (51, 19182), (52, 19215), (53, 19236), (54, 19239), (55, 19296), (56, 19320), (57, 19335),
(58, 19365), (59, 19371), (60, 19449), (61, 19452), (62, 19506), (63, 19530),

Gene: Tortoise12_20 Start: 17556, Stop: 19550, Start Num: 4
Candidate Starts for Tortoise12_20:
(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706),
(16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),
(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),

(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Xerxes_20 Start: 17553, Stop: 19547, Start Num: 4
Candidate Starts for Xerxes_20:
(3, 17541), (Start: 4 @17553 has 21 MA's), (5, 17565), (6, 17577), (9, 17631), (14, 17700), (15, 17703), (16, 17712), (18, 17727), (20, 17889), (21, 17967), (22, 17982), (23, 18012), (24, 18060), (25, 18084), (26, 18102), (27, 18150), (28, 18186), (29, 18210), (30, 18345), (31, 18402), (32, 18447), (33, 18507), (34, 18540), (35, 18549), (36, 18630), (37, 18774), (38, 18807), (39, 18825), (40, 18849), (41, 18861), (42, 18882), (43, 18912), (44, 18927), (45, 18930), (46, 18951), (47, 19041), (48, 19107), (49, 19149), (50, 19152), (51, 19182), (52, 19215), (53, 19236), (54, 19239), (55, 19296), (56, 19320), (57, 19335), (58, 19365), (59, 19371), (60, 19449), (61, 19452), (62, 19506), (63, 19530),